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Market report



# Tokenization: practitioner point of view

All you need to know to tokenize successfully any asset.

Foreword by Dr. Jacques Iffland, partner at Lenz & Staehelin,  
Chairperson of the Capital Markets and Technology Association

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# Foreword by Dr. Jacques Iffland, partner at Lenz & Staehelin, chairperson of the CMTA

In the financial markets, distributed ledger and blockchain technologies are often associated with the idea of cryptocurrencies. Such means of digital payment, however, only represent a small part of the universe of financial instruments that are now generally referred to as "digital assets", and which have in common that they are based on "distributed ledger technology" or "DLT". But one of the most appealing features of this technology is that it opens the door to a welcome modernization of the way in which securities and financial products are issued, held and transferred as well as the way in which businesses interact with investors.

Most of the time, the process for issuing and transferring securities (such as shares in private companies) is hardly different today from what it was two centuries ago: shares and other transferable securities are issued in the form of physical certificates, and are transferred through the manual delivery of documents bearing assignments and wet-ink signatures. Deciding not to issue certificates (as some companies do) is hardly an adequate alternative, as this exposes the acquirer to the risk of multiple assignments, and of losing track of the rightful owner of a particular security. Publicly traded securities are generally held through custodians and transferred through the debit and credit of custody accounts, but the costs of keeping such "intermediated" securities with custodians and central securities depositaries are significant.

The DLT represents a quantum leap in this context, since it makes it possible to associate securities (and other financial instruments) with digital tokens recorded on a distributed ledger (typically a blockchain), rather than with physical certificates. Transfer of such "tokenized" securities are time-stamped, publicly accessible on the ledger and unfalsifiable, with the personal data of the relevant holders protected by cryptographic means. Since the DLT makes it technically impossible to transfer the same digital token twice on a distributed ledger, the transfer of a particular tokenized security can always be traced. Digital tokens can be either held by their owners themselves (through the control of so-called "private keys") or through professional custodians, in the same manner as traditional intermediated securities.

It is to the credit of the Swiss federal authorities to have recognized early the potential of the DLT for the financial sector, and to have adopted legislation that provides a clear and reliable legal framework for the digitalization of financial instruments. Under the Swiss legislation often referred to as the "Lex DLT", financial instruments of Swiss or foreign issuers can be associated with digital tokens created by means of a digital code referred to as a "smart contract", and recorded on a (public or private) distributed ledger such as the Ethereum or Tezos blockchains. Trade bodies such as the Capital Markets and Technology Association have further adopted standards to facilitate the issuance, trading and custody of such digitalized financial instruments.

The consequences of the drive to digitalization are profound. Tokenization simplifies how securities can be issued, transferred, held or admitted to trading, and the manner in which businesses can raise capital to finance their activities. But the digitalization of securities also opens the door to possibilities that go beyond the mere replication of existing capital market infrastructures. The digital code that governs tokenized securities can be given properties that are unknown to traditional securities, such as the automation of certain corporate actions (e.g. dividend or interest payments) or the management of equity plans (e.g. the vesting, exercise or forfeiture of equity grants to directors or employees). Digitalization can also facilitate the implementation of mechanisms adopted in the context of private equity transactions (e.g. the drag along or call features that can regularly be found in shareholders' agreements) or the realization of certain compliance processes such as the identification of security holders or beneficial owners.

Tokenization opens the door to a broad universe of new possibilities, which the financial industry is only starting to comprehend and embrace. With a well-designed and flexible legislation that creates an explicit legal basis for the digitalization process, Switzerland is well positioned to take advantage of the new technology's possibilities. Its flexible and DLT-friendly regulatory framework also allows it to become the home of financial intermediaries and trading platforms organized to take full advantage of the benefits of the DLT in the financial sector.

# Preamble

This paper sheds some light on the concept of tokenization of securities, which is distinct from other types of token instruments (such as utility tokens and NFTs representing digital art), from a European perspective, and in particular a Swiss one. Its objective is to provide the reader with a "practitioner" report based on real tokenization transactions Taurus was involved in.

Over the last couple of quarters, Taurus participated in ca. 15 tokenization deals, either directly with issuers or in collaboration with banks that use Taurus' tokenization technology. Our experience spans different asset classes including equity shares, participation capital, debt instruments, structured products, etc.

This paper does not try to forecast tokenization market size (not our objective) but rather gives the reader a sense of the asset types and asset pools that we believe are eligible for tokenization. This paper's other core objective is to provide the reader with a step-by-step approach to tokenize any type of security.

Section II introduces tokenization and provides definitions. Section III describes the tokenization process and provides detailed operational aspects for issuers contemplating the tokenization of assets. Section IV puts Section III in practice with real case studies covering equity, debt, and structured products.

We hope this document provides you with some valuable insights and hope you will enjoy the reading.



## II. Asset tokenisation: introduction

### 1. Definition: What is tokenization

Tokenization is simply the process of digitizing securities and registering them in a distributed ledger such as a blockchain. In this respect, digital tokens are created and are associated or represent a security, for example:

- Equity shares,
- Participation certificates,
- Debt instruments,
- Shares of investment collective schemes (i.e., funds)
- Structured products

Tokenization can be seen as the representation of traditional securities as digital assets, also known as ledger-based securities. Importantly, in Switzerland (source: CMTA, <https://cmta.ch>):

- Tokenization does not result in the creation of new types of assets. Tokenized shares are -- and remain -- shares in the company that issued them;
- A company can only tokenize shares that already exist, meaning that shares need to be issued in accordance with Swiss Corporate Law before they can be tokenized;
- Tokenized shares will not constitute a new class of shares under Swiss law.

The above should hold true for other jurisdictions that recognize ledger-based securities (see Section III below).

### 2. Addressable markets: private markets

To simplify, there are two main value chains in the securities world:

- Listed markets | Listed capital markets: Consisting of securities listed on stock exchanges. For example, this includes large companies that are listed on a stock exchange or pursuing an IPO;
- Private markets: Consisting of the remainder of securities. For example, this includes Taurus, QoQqa, Bank Cité Gestion or any small or medium enterprises ("SME") that you can find around you.

This paper will avoid making forecasts. It will rather highlight global asset pools to give the reader a sense of the addressable market (see Figure 1 below).

By end of 2021:

- World GDP: USD 96.53 trn;<sup>1</sup>
- Listed markets were a combined USD 249 trn, USD 121<sup>2</sup> trn from Listed equities and USD 128<sup>3</sup> trn from Listed debt (debt instruments can also be listed);
- Private assets fat-finger estimates is USD 289 trn, the bulk of which comes from real-estate

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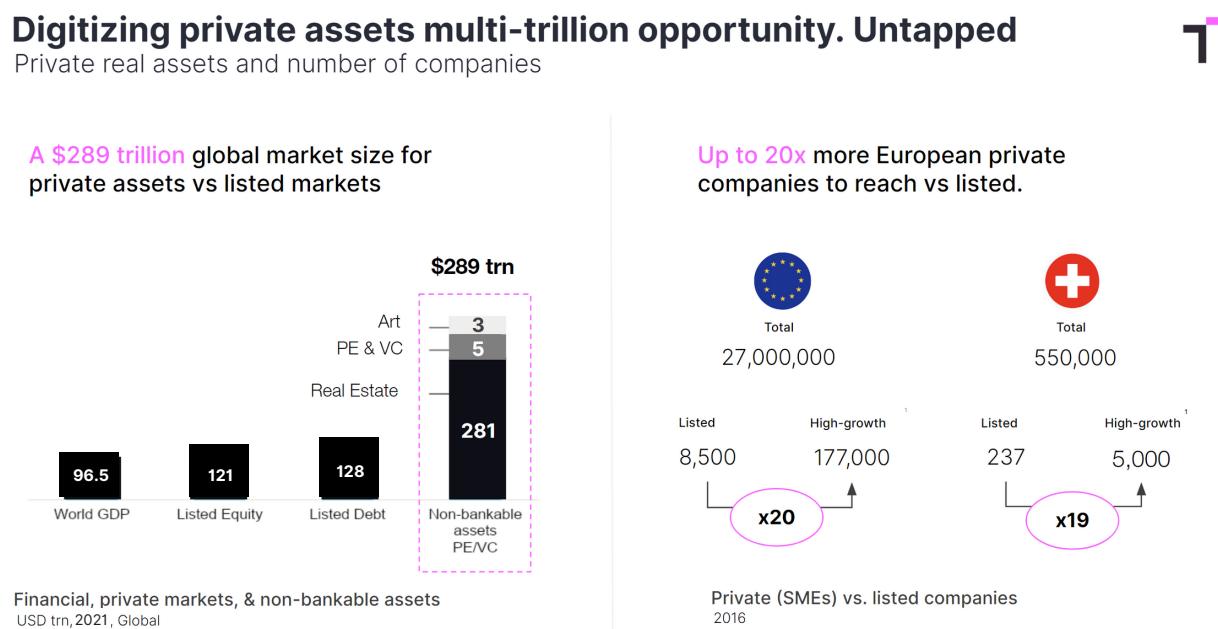


Figure 1: Global asset pools

<sup>1</sup> Number of companies with at least 10 employees with 10% annual growth as per Eurostat definition  
Source: IMF, Worldbank, Preqin, Eurostat, FESE.eu, ESMA, CMTA, Taurus analysis

<sup>2</sup> <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>  
<sup>3</sup> <https://focus.world-exchanges.org/articles/market-capitalisation>

It is interesting to notice that in the European Union and UK, there are 27 million corporations out of which only approximately 8'500 are listed companies. This means there's 3'000x more private companies than listed ones.

All companies in the world must have share capital. A lot are very tiny (2-3 people shops) ones with a stable shareholder base (think, your bakery next door) and do not need to perform much financial activity or have their shares digitized. However, many others need to grow and attract talent: they need to finance themselves through capital increases or through debt securities. They may also need to put in place employee incentive plans (shares, stock options, etc.).

According to Eurostat, a sizable pool of 177'000 companies qualify as high growth.<sup>4</sup> We believe that tokenization can be helpful for a fair share of said companies.

One of Taurus' deep convictions since our inception is that **tokenization has a major potential in the private markets value chain, as opposed to the listed capital markets**. The former is mostly paper-based, it can take weeks or months to transfer shares of a private company, while the latter, despite what some believe, is pretty well standardized and works relatively well (see Figure 2 below). Figure 2 analysis below compares traditional private (paper-based) securities with tokenized securities and listed securities.

Tokenization could open worlds not imagined yet to private assets in a similar way to how the internet and e-commerce transformed many industries over the last two decades. Over the next few years, buying or selling shares of a private corporation should be as easy as buying a book on Amazon for (i) the technology exists and (ii) regulation exists as the next section shows. See Section III that describes main benefits.

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## Tokenization is about the digitization of private assets / securities



	Private securities V1.0 - traditional	Private securities V2.0 - tokenized	Public securities Listed
1 Securities format	<input checked="" type="checkbox"/> Paper <input checked="" type="checkbox"/> Custom	<input checked="" type="checkbox"/> Electronic <input checked="" type="checkbox"/> Disintermediated <input checked="" type="checkbox"/> Programmable	<input checked="" type="checkbox"/> Electronic <input checked="" type="checkbox"/> Intermediated <input checked="" type="checkbox"/> Standardized
2 Booking & settlement	<input checked="" type="checkbox"/> Paper, manual <input checked="" type="checkbox"/> Non-bankable	<input checked="" type="checkbox"/> Electronic, instant <input checked="" type="checkbox"/> Bankable or not	<input checked="" type="checkbox"/> Electronic, T+2 <input checked="" type="checkbox"/> Bankable
3 Trading	<input checked="" type="checkbox"/> Manual (via bulletin board)	<input checked="" type="checkbox"/> 24/7 electronic	<input checked="" type="checkbox"/> Electronic (via stock exchanges)
4 Price discovery / liquidity	<span style="width: 10%;">█</span> <span style="width: 80%; background-color: #cccccc;">░░░░░░░░░░</span>	<span style="width: 80%; background-color: #00ff00;">██████████</span> <span style="width: 20%; background-color: #cccccc;">░░░░░</span>	<span style="width: 100%; background-color: #00ff00;">████████████████</span>
5 Costs	<span style="width: 20%; background-color: #00ff00;">████</span> <span style="width: 80%; background-color: #cccccc;">░░░░░░░░░░</span>	<span style="width: 10%;">█</span> <span style="width: 90%; background-color: #cccccc;">░░░░░░░░░░</span>	<span style="width: 100%; background-color: #00ff00;">████████████████</span>
6 Public transparency requirements	<span style="width: 10%;">█</span> <span style="width: 90%; background-color: #cccccc;">░░░░░░░░░░</span>	<span style="width: 50%; background-color: #00ff00;">████████</span> <span style="width: 50%; background-color: #cccccc;">░░░░░░</span>	<span style="width: 100%; background-color: #00ff00;">████████████████</span>

Source: Taurus

13

Figure 2: Comparison of securities cases

<sup>4</sup> Companies with at least 10 employees at 100% annual growth

### 3. Regulatory framework overview

Tokenization of assets is not possible everywhere in the world, yet. However most financial centers are increasingly adopting a clearer regulatory framework with respect to digital assets. Issuers must make sure that the country or jurisdiction they are incorporated in recognizes ledger-based securities in their law. See Figure 3 below for a high-level overview of key financial centers and their respective regulatory frameworks in relation to digital assets at large.

- **Germany:** the German electronic securities act, which entered into force in June 2021<sup>5</sup>, reformed the German securities law. It allows – among others – the establishment of a new form of electronic securities, that can be booked on a Crypto Securities Register which is another name for distributed ledgers. In addition, Crypto Securities Register services are a financial service subject to licensing obligations. Several of Taurus' banking clients are considering applying for this license;
- **Luxembourg:** The law of 1 March 2019 had already recognized the possibility to hold and register book-entry securities in securities accounts through DLT.<sup>6</sup> The law of 22 January 2021 allowed for lux-based dematerialized securities (listed or unlisted) to be issued on distributed ledgers. On February 20, 2023, Luxembourg chamber voted Law Project 8055 that transposed the UE Pilot regime in local law and further clarified the above.
- **Switzerland:** was the first Tier 1 financial center in the world to provide a clear regulatory framework related to digital assets and tokenized securities (see below)

Cryptocurrencies		Tokenized securities		Digital currencies	
	Crypto-assets regulatory classification	Banks performing custody	DLT-based securities legalisation	Stablecoin payment permissible	CDBC test
 CH	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> 2021	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
 SG	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> 2021	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
 US	<input checked="" type="checkbox"/>	Commodity classification	<input checked="" type="checkbox"/> Selected states	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
 DE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> 2021	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
 LUX	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> 2021		
 UK	<input checked="" type="checkbox"/>		No specific law	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 3: Direct correlation between regulation clarity and financial institution digital asset penetration

### Focus Switzerland DLT framework

Switzerland was the first Tier 1 financial center to provide a complete DLT-compatible framework. In 2021, the DLT act entered in two packages.

February 2021: article 973d of the Swiss code of obligations expressly recognizes ledger-based securities and defines the corresponding securities ledger requirements.<sup>7</sup>

#### H. Ledger-based securities

- 1 A ledger-based security is a right which, in accordance with an agreement between the parties:
  - a. is registered in a securities ledger in accordance with paragraph 2; and
  - b. may be exercised and transferred to others only via this securities ledger.
2. The securities ledger must meet the following requirements:
  - a. It uses technological processes to give the creditors, but not the obligor, power of disposal over their rights.
  - b. Its integrity is secured through adequate technical and organizational measures, such as joint management by several independent participants, to protect it from unauthorized modification.
  - c. The content of the rights, the functioning of the ledger and the registration agreement are recorded in the ledger or in linked accompanying data.
  - d. Creditors can view relevant information and ledger entries, and check the integrity of the ledger contents relating to themselves without intervention by a third party.
3. The obligor must ensure that the securities ledger is organized in accordance with its intended purpose. In particular, it must be ensured that the ledger operates in accordance with the registration agreement at all times.

August 2021: Market infrastructure law recognises a new type of DLT infrastructure, the fourth type of infrastructure. Stock exchange, MTF, OTD, and DLT infrastructure. Article 73a defines it the following way:<sup>8</sup>

1. DLT trading facility is a commercially operated institution for multilateral trading of DLT securities whose purpose is the simultaneous exchange of bids between several participants and the conclusion of contracts based on non-discretionary rules and which meets at least one of the following criteria:
  - a. It admits participants in accordance with Article 73c paragraph 2 letter e.
  - b. It holds DLT securities in central custody based on uniform rules and procedures.
  - c. It clears and settles transactions in DLT securities based on uniform rules and procedures.
2. The criterion of a commercial basis is deemed satisfied by an independent economic activity pursued on a permanent, for-profit basis.

5 [https://www.bafin.de/SharedDocs/Veroeffentlichungen/EN/Fachartikel/2021/fa\\_bj\\_2107\\_eWpG\\_en.html](https://www.bafin.de/SharedDocs/Veroeffentlichungen/EN/Fachartikel/2021/fa_bj_2107_eWpG_en.html)  
 6 <https://www.cliffordchance.com/insights/resources/blogs/talking-tech/en/articles/2021/01/luxembourg-law-recognises-the-use-of-dlt-for-the-issuance-of-dem.html>  
 7 [https://www.fedlex.admin.ch/eli/cc/27/317\\_321\\_377/en](https://www.fedlex.admin.ch/eli/cc/27/317_321_377/en)  
 8 <https://www.fedlex.admin.ch/eli/cc/2015/853/en>

### III. Tokenization: process and operational aspects

The present section gives the reader that is considering tokenization a step-by-step booklet to successfully tokenize any type of asset, in compliance with applicable laws and regulations.

#### 1. Why tokenize – benefits of tokenization

There are a wide range of benefits in tokenizing securities, depending on the point of view taken.

- Electronic, programmable and disintermediated format: the transfer of securities is instantaneous and features can be programmed directly in the security (whitelisting, freeze, unfreeze, destroy and recreate, etc.)
- Instant booking and settlement: it means issuers can book their securities with Banks (if they wish to) and settlement
- Simplified trading: thanks to electronic trading, issuers can easily provide liquidity to their shareholders or employees, potentially 24/7.
- Price discovery mechanisms: are significantly improved assuming the issuers admit for trading their securities with a regulated marketplace
- Costs: financial and operational costs remain reasonable, with in addition the cost of annual reports, as required to admit securities for trading on a regulated marketplace. For the avoidance of doubt, a company admitted for trading on a regulated market place such as an Organized Trading Facility (as defined in Swiss law) remain private companies. These costs are therefore a fraction of what listed companies are required to produce.
- Public transparency: the price to pay to be traded in a regulated marketplace is to accept that financial statements be disclosed.

See below the analysis analysis of the Capital Markets and Technology Association:

#### Benefits of tokenization – adapted from the [www.cmta.ch](http://www.cmta.ch)

- Legal aspects: The tokenization of shares increases the level of certainty that the acquirer of such instruments can place in the fact that it will effectively be recognized as their legal owner. The holder of a tokenized security cannot transfer that instrument twice. The buyer of such instruments can consequently be confident that the seller actually owned the transferred securities. This is a significant difference with traditional uncertificated securities (like, for example, the shares of a company for which no physical share certificates have been issued). With a traditional uncertificated security, the transferee only acquires a legal title to the transferred instrument if the transferor had such legal title itself. This is generally difficult to establish. Doing so requires evidence of an uninterrupted chain of assignments between all the persons who owned the instrument from the moment it was first issued. Often, evidence of such an uninterrupted chain of assignments will be missing. The buyer will then only be in a position to hope that the seller owned the transferred securities. With a tokenized security, the buyer has certainty on the subject, and Swiss law recognizes the legal title of the token's acquirer to the associated security.
- Financing models: As mentioned in Section II above, tokenization enables non-listed, private companies to leverage new financing and investment models.

Tokenization allows them to open their capital to investors by different means and through different channels, such as regulated digital platforms. So far, investors had few options to invest in those companies and had easy access only to public companies listed on stock exchanges. Tokenization thus could contribute to the modernization and democratization of finance, by making investment simpler and more accessible to the average investor. See last section for a use case where Qoqa Services limited raised CHF 1.2mn in 19 minutes from its customer base. Note also that a company with a poor business model and business results will remain a poor company even if tokenized.

- Cost savings: Tokenization may also reduce operational and financial costs, for companies and investors alike. Acquiring and transferring tokenized shares is direct and immediate, when transferring an uncertificated security may take weeks if not months:
  - Faster execution of transactions, being potentially a matter of seconds.
  - Fewer intermediaries, thus reduced associated costs;
  - Tokenization further allows companies to automate certain contractual tasks and corporate actions, via smart contracts such as the CMTAT token.

## 2. Asset universe eligible for tokenization

This tokenization process is not restricted to equity shares. It can work for assets including commodities, real estate, debt, structured products, funds and also art pieces, as well as certain forms of intangible assets such as ownership rights or content licensing.

Regardless of the asset class, tokenization increases the level of certainty with which a holder is effectively recognized as legal owner. Potential buyers can be confident that the seller actually owns the securities put for sale. This is a significant change compared to traditional uncertificated securities as the transferee only acquires a legal title to the transferred instrument if the transferor has such a legal title itself, which may be difficult to establish. You may have to establish an uninterrupted chain of assignments.

Tokenization enables non-listed, private companies to leverage new financing and investment models. It allows them to open their capital to investors by different means and through different channels, such as online exchange platforms.

So far, investors had few options to invest in those companies and had easy access only to public companies listed on stock exchanges. However, there are fewer than 300 such companies, whereas Switzerland counts approximately 600,000 SMEs. Tokenization thus contributes to the modernization and democratization of finance, by making investment simpler and more accessible, notably for retail investors.

Tokenization will enable increased liquidity as assets are fractionalized instead of being concentrated. Investors will therefore also benefit from reduced lock up periods especially in assets such as art and real estate considered to be highly illiquid.

Traders will additionally benefit from cheaper and faster transactions simply because there are less intermediaries (more automation) and these markets operate 24/7.

## 3. Tokenization 6-bullet point check-list

Before tokenizing assets, the following check-list can help. Make sure that you have a positive answer for all items:

- Check 1**  
**In my country of incorporation, ledger-based securities or equivalent are recognised by law**
- Check 2**  
**Tokenization provides benefits to my business and/or shareholders and/or employees**
- Check 3**  
**I have a law firm that is knowledgeable about tokenization**
- Check 4**  
**I have a certified technology partner that can help me throughout the process**
- Check 5**  
**I have a financial institution that can book the securities for my investors, if needed**
- Check 6**  
**Smart contracts: there are standard smart contracts, audited, and recognised in the market**

Taurus can support issuers in 4 and 5. As for point 6, CMTA's CMTAT<sup>9</sup> token framework is the de facto national standard in Switzerland and can be a good base for other jurisdictions to start with.

<sup>9</sup> <https://cmta.ch/standards/cmta-token-cmtat>

## 4. Tokenization process: Equity capital raise

This section provides a step-by-step walkthrough of the tokenization process for a capital raising exercise under Swiss-law. It leverages the CMTA standard for tokenization<sup>10</sup> of shares. Other less complex exercises (without tokenization) are a subset of the below process. For tokenization in other jurisdictions (see Section II above), make sure you are advised by a knowledgeable law firm.

1. Legal preparation: adapt articles of incorporation so that they include ledger-based securities as a valid form of securities. Define a tokenization regulations to be enacted by the Board of Directors (see CMTA standard)

2. Preparation of smart contracts: identify audited smart contracts that incorporate regulatory requirements related to ledger-based securities. In Switzerland, use the CMTAT standard. Elsewhere, use your local jurisdiction's standard. In the case there is none, the CMTAT is a good starting base. Make sure the smart contract is accepted by the financial institution you are planning to work with if any.

3. Preparation of investor materials: this is needed only if the issuer raises funds. As regulation is technology neutral, this step should be the same whatever the type of security is (ledger-based or not).

4. Board resolutions and regulations: Based on point 1 above, the Board should minute a decision to tokenize the shares in-line with its articles of association and tokenization regulations.

5. Admission for trading – preparation: Taurus runs its own FINMA-regulated organized trading facility. The issuers should open an account with the trading platform.

## Example of tokenization process

Example: tokenization of already-existing shares of a joint-stock corporation

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Tokenisation					Admission for trading	
Legal preparation	Preparation of smart contracts	Preparation of investor materials (if applicable)	Board resolutions and regulations	Smart contract deployment	Preparation	Admission
✓ Legal analysis	✓ Selection of distributed ledger technology to issue the smart contract	✓ Preparation of marketing material	✓ Board decision to tokenize shares	✓ Deployment of the smart contract on the target DLT	✓ Preparation of onboarding documentation package	✓ Review and signature of trading admission agreement
✓ Amendments of articles of association: (1) Ability to issue shares in uncertificated form	✓ Writing+audit of the smart contract (if applicable)	✓ Preparation of investor section on the corporation's website	✓ Adoption of the internal regulations referred to the registration and tokenization of shares	✓ Allocation of tokens to shareholders	✓ Definition of liquidity scheme	
✓ Amendments (2) Exclusion of the right of shareholders to request the delivery of certificates,	✓ Definition of main target features / smart contract standard (e.g., CMTAT)	✓ Preparation of prospectus (if applicable)				
✓ Amendments (3) delegation to the board of resp. to define rules for the transfer of tokens and exercise of voting rights	✓ Gather distributed ledger addresses of existing shareholders					
SUPPORT	✓ Legal advisor ✓ Notary	✓ Tokenization technology service provider  Marketing support firm ✓ Legal advisor	✓ Legal advisor	✓ Tokenization technology service provider	✓ Digital asset exchange (OTF)	✓ Digital asset exchange (OTF)

Source: CMTA Tokenization Blueprint, Taurus

Figure 4: Tokenization process: equity capital raise and admission on T-DX.com

10 <https://cmta.ch/standards/standard-for-the-tokenization-of-shares-of-swiss-corporations-using-the-distributed-ledger-technology>

## 5. Tokenization process: Smart contract management

Understanding smart contract technology is not necessary if (i) you have industry standards at your disposal and (ii) a technology partner by your side. It is important to make sure that once the smart contract that represents your security has been issued:

- Issuance: The smart contract has been issued properly, using an enterprise-grade solutions. In particular the private key representing the smart contract address should be at all times protected for you risk of being hacked if not done properly;
- Custody and asset servicing: this point is overlooked in the industry by many people, including some that aim to be tokenization experts. A smart contract representing a security typically includes numerous features (or functions) that a cryptocurrency does not have. Therefore custody of tokenized securities is way more than just protecting private keys and allowing transfers, mint, or burn. For example:

- Transfer restriction: such a function enforces on-chain certain rules to (dis)allow transfers. A typical mechanism is whitelisting, where the list of addresses authorized to own the tokenized asset is defined in advance.
- Freezing and unfreezing: such a function freezes transfers of one or more accounts (thus preventing transactions)
- Mint: this function creates new units of a security's token. Note that this may or may not correspond to the actual issuance of new securities
- Burn: this function destroys units of a security's token
- Corporate actions: split, dividend payments, coupon payments, votes, and so on. These functions allow the issuer to perform mandatory activities related to a security.

The above means that the issuer must ensure that they are in a position to, or the financial services provider they worked with to perform asset servicing functions at any point in time. Those capabilities are mandatory for the issuer or its representative (financial institution) have a fiduciary duty and legal obligations towards the security owners (shareholders, debtholders).

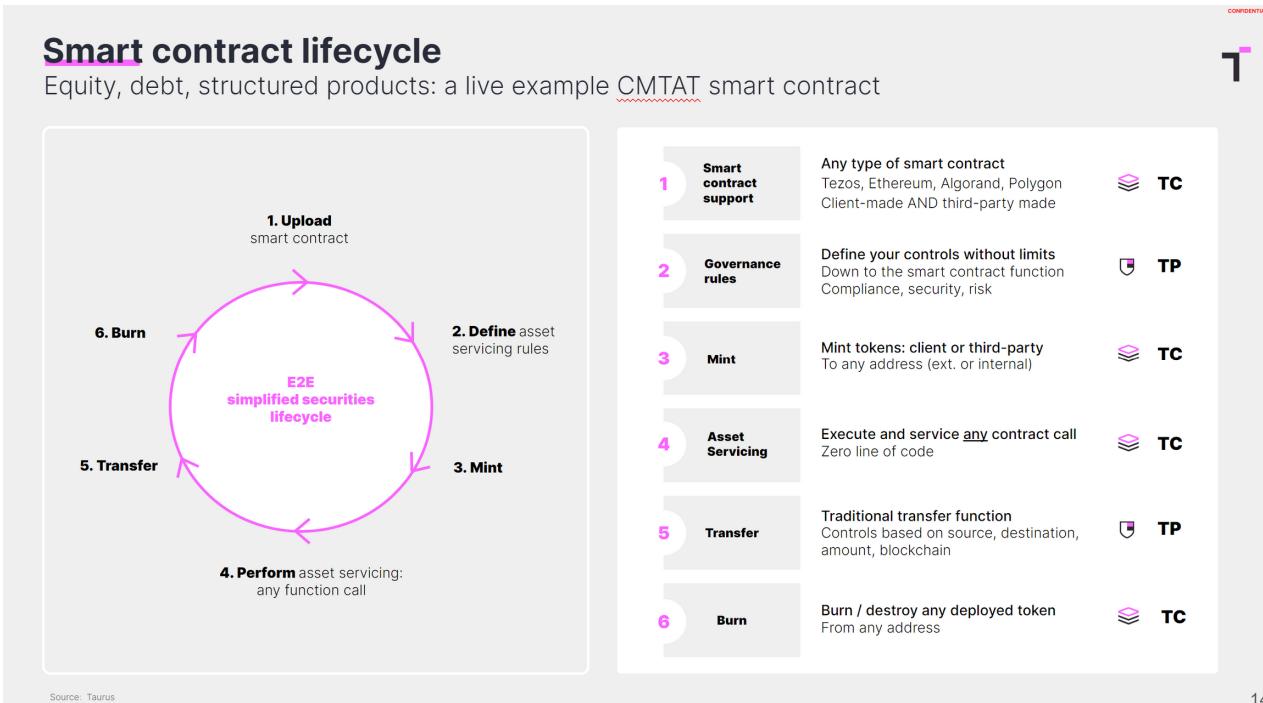


Figure 5 shows a simplified lifecycle example of tokenized securities smart contracts on the left hand side, and the key activities that need to be performed on the right hand side. Taurus has built a full suite of products and services that allows issuers and financial institutions manage ANY tokenised assets (equity, debt, structured products) and perform asset servicing duties automatically with zero line of code.

## 6. Trading tokenized securities

Tokenizing private assets is good. Being able to trade on a regulated platform is great. This is why Taurus decided to apply for a FINMA license to provide an independent secondary market to its banking clients, issuers and investors. In April 2021, Taurus launched Taurus T-DX platform, one of the first regulated marketplaces for tokenized assets in the world.

### Attention points

- Issuers cannot list their securities in cryptocurrency exchanges (i.e., Coinbase, Bitstamp, Kraken, Binance, and so on) for they do not have the license to deal with securities.
- Private asset owners cannot or should not list their securities in a stock exchange, even those branding themselves “blockchain”: by doing so, a company de facto performs an IPO, and lose its private company status.
- Therefore, go with an OTF or DLT license in Switzerland, or the applicable license if your country is in the European Union

### a. Switzerland

The Swiss regulatory framework allows issuers to admit for trading their securities, for example, on organized trading facilities (OTFs) and still keep their private security status (i.e., not listed, no IPO). Figure 6 below compares cryptocurrency exchanges, OTFs and stock exchanges from a regulatory perspective.

#### TDX vs. crypto and stock exchanges?

Regulated. Higher flexibility + lower costs than an Exchange by an order of magnitude



		Crypto-Exchange	TDX	Stock-Exchange
1	Regulated	License	✗	✓ OTF (art. 42 FMIA)
2	Admitted types of instruments	Securities Tokenized securities Crypto-currencies	✗ ✗ ✓	✓ ✗ ✗
3	Admitted participants	Regulated Private investors	✓ ✓	✓ ✗
4	CSD		✗ Ledger-based securities	✓ Central securities deposit
5	Investor protection		✗	✓
6	Costs	High fees for big exchanges	✗ Low costs / for every business size	✗ High costs, only for large companies/IPOs

Source: Taurus

Figure 6: Crypto-exchange vs. OTF vs. Stock Exchange

### b. European Union

For the time being, trading tokenized securities in the European Union was in a legal no man's land. The EU DLT Pilot regime solves partially for this problem. The EU DLT Pilot final version was enacted on 23 June 2022 and entered into full force on 23 March 2023. The permission to operate DLT market infrastructure in accordance with the Pilot Regime is by essence temporary (limited to a period of up to six years) and will be periodically reviewed by supervisors.

The DLT Pilot Regime establishes the conditions for:

1. Permission to operate a DLT market infrastructure and exemptions (art. 4 to 8),
2. Limitations on the DLT financial instruments that can be admitted on trading and settled on the DLT (art. 3), and
3. Cooperation between the DLT market operator, competent authorities and the European Securities and Markets Authority (ESMA) (art. 9).

With regard to the point 1 above, authorized financial institutions (investment firms, market operators, central securities depositories or CSDs) are allowed to request permission to operate a DLT market infrastructure under the Pilot Regime. Furthermore, as the access to the Pilot Regime is not limited to incumbent financial institutions as per the regulation, new entrants also have the possibility to do so.

The DLT Pilot provides a legal framework for the trading and settlement of transactions in those crypto-assets that qualify as financial instruments within the meaning of Directive 2014/65/EU ("MiFID II"), hence true digital securities. For the other crypto-assets that do not qualify as financial instruments (such as stable-coins, e-money tokens and utility tokens), the dedicated regulatory framework at EU level (MiCA) will apply.

In terms of financial instruments that can be admitted to trading and settled on the DLT, and in order to allow innovation and experimentation, a DLT securities settlement system is limited to securities,

such as shares and bonds that are not liquid. Conditions are the following as per article 3 paragraph 1:

- Shares, the issuer of which has a market capitalization or a tentative market capitalization of less than EUR 200 million; or
- Convertible bonds, covered bonds, corporate bonds, other public bonds and other bonds, with an issuance size of less than EUR 500 million.

In addition, the aggregate market capitalization shall not exceed EUR 2.5 billion at the moment of admission to trading, or initial recording, of a new DLT financial instrument.

We believe that it's going to take a few quarters to see the first truly operational DLT-ready infrastructure in the EU. In the meantime, EU issuers can admit for trading their securities in other jurisdictions (Switzerland is an option) provided they have a solid legal opinion allowing them to do so.

**EU DLT pilot regime overview**

	Crypto-Exchange	DLT Pilot	Conditions and limits
1 Regulated	License	✗	Max pilot regime: up to 6 years Max market capitalization: EUR 2.5bn In aggregate
2 Admitted types of instruments	Securities Tokenized securities Crypto-currencies	✗ ✗ ✓	Shares: max market cap EUR 200mm Bonds: max issuance size EUR 500mm
3 Admitted participants	Regulated Private investors	✓ ✓	✓ ✓
4 CSD required	No	Yes/No Ledger-based securities	
5 Investor protection	✗	✓	
6 Low costs for issuers	N/a High fees for big exchanges	✓ Low costs / for every business size	

Source: Taurus

Figure 7: EU DLT pilot regime

## 7. Other relevant considerations

The following aspects are also important from an operational perspective. We will cover them indirectly in Section IV (use cases).

- Blockchain platform choice: which blockchain shall I use? You should use reputable and time-tested blockchains to issue your securities. All else equal, an easy way to answer the question, is to select those for which tokenized assets standards already exist. For example, in Switzerland, issuers mostly rely on Ethereum or Tezos. Then, issuers may select blockchains:
  - That are easy to use: toolkits, user-guides, wallets exist
  - That have a wide adoption: avoid niche unused platforms
  - Whose underlying blockchain does not consume energy: environment friendliness is an increasingly important criterion

- For which transaction costs are low.

The goal of this article is not to compare blockchains so we will leave it to the reader due their own due diligence, based on their requirements.

- Legal partner: while tokenization of assets represent the future of private markets, tokenization of assets is more of a legal structuring exercise than a technological one. Make sure you surround yourselves with legal experts, that ideally, have had a couple of tokenization experience.
- Technology partner: same, make sure you select players whose products, processes and organization are securities-ready as opposed to crypto-players trying to surf on a wave they do not master. A cryptocurrency has nothing to do with a tokenized security.

## IV. Reflection on 3 use cases: Equity, debt, structured products

Taurus has performed today more than 15 tokenization deals in production across different asset classes (figure 8) leveraging its integrated and modular platform for the issuance, custody, asset servicing, blockchain connectivity and trading. (figure 9). This section focuses on 3 use cases powered by Taurus' technology highlighting our practitioner point of view across different type of assets and issuers, namely:

**1** Asset: Equity + Capital raise  
Issuer: Mid-cap private company

**2** Asset: Structured products  
Issuer: Banks

**3** Asset: Debt  
Issuer: Asset managers

Go beyond custody. 15 tokenisation deals performed directly.						CONFIDENTIAL	T
Real production. Selected examples. Not exhaustive							
<b>STRUCTURED PRODUCTS</b>	Dec 22	◆ Public - Ethereum testnet	CMTAT	CREDIT SUISSE	PICTET	Vontobel	
<b>FUNDS</b>	Nov 22	◆ Public - Ethereum mainnet	Confidential		<b>CONFIDENTIAL</b>		
<b>EQUITY</b>	.Jul 21	◆ Public - Ethereum mainnet	CMTAT	QoQaBrew CRAFT BEER	ALAIA	CITE GESTION	
<b>DEBT</b>	Jan 23	◆ Public - Ethereum mainnet	Custom	SCCF	HORIZON CAPITAL		<b>CONFIDENTIAL</b>
<b>STABLE COINS</b>	On-going	EVM Private blockchain	Custom		<b>CONFIDENTIAL</b>		
<b>NFTs</b>	Jan 23	◆ Public - Ethereum mainnet ◆ Public - Tezos mainnet	ERC 721 / 1155 FA 2.0	Consumer brand 1	Luxury brand 1		

Source: Taurus

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Figure 8: Taurus tokenisation deals overview - not exhaustive

## 1. Tokenization use case 1: Equity capital raise



**Company name:** QoQa Services SA (Ltd)    **Revenues**: ca CHF170mn  
**Industry:** e-commerce    **Website**: qoqa.ch

### KEY HIGHLIGHTS

Tokenization to raise capital and community engagement

- QoQa Services SA (<https://www.qoqa.ch>) is a well-known e-commerce platform in Switzerland with ca. USD 170 mn revenues in 2021 and a 800 '000 strong community of customers, very engaged with the brand. QoQa had been investing tokenization and ways to engage with its customers for a couple of years.
- In Q3 2021, QoQa wanted to tokenize the shares of one of its subsidiaries and raise capital with the support of its community.
- On 20 May 2022, at 10.00pm CET, QoQa launched its fundraising campaign as a time-limited window to its customers. It managed to raise CHF 1.2mn in 19 minutes from ca. 2'000 investors. 20'000 interested investors were in the queue.

### CAPITAL RAISE OBJECTIVE

**Target amount:** CHF 1.2mn

**Target investors:** Swiss residents



### RESULTS

**Raised amount:** 100% target in 19 minutes

**Secondary trading:** pending project delivery

### OVERVIEW

Full tokenization	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Primary market support	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Secondary trading	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Regulated marketplace	<input checked="" type="checkbox"/> T-dx.com	<input type="checkbox"/> Others
Token standard used	<input checked="" type="checkbox"/> CMTAT	<input type="checkbox"/> Others
Blockchain	<input checked="" type="checkbox"/> Ethereum	<input type="checkbox"/> Others
Asset class	<input checked="" type="checkbox"/> Equity	<input type="checkbox"/> Participation certificates <input type="checkbox"/> Debt <input type="checkbox"/> Structured products

### TOKENIZATION PROCESS

QoQa decided to tokenize part of its capital structure – remember a Company does not need to tokenize all its capital structure. The core equity of QoQa Brew SA would therefore not be tokenized for the mother company did not need it to be so and only the part to be raised will be tokenized as participation certificates (shares without voting rights) for simplicity reasons. Investors will become participation holders of the company, have the same economic rights as the mother company (i.e., dividends).

QoQa leveraged Taurus technology suite i.e.,

- Taurus-CAPITAL to tokenize securities,
- Taurus-PROTECT for custody
- Taurus-EXPLORER for the share transfer.
- Taurus Investor portal: was used to perform KYC/AML of investors.

From a legal point of view, the fundraising process followed all applicable Swiss requirements and was advised by Vischer law firm.

## 2. Tokenization use case 2: Structured Products



Vontobel

cmta.

### KEY HIGHLIGHTS

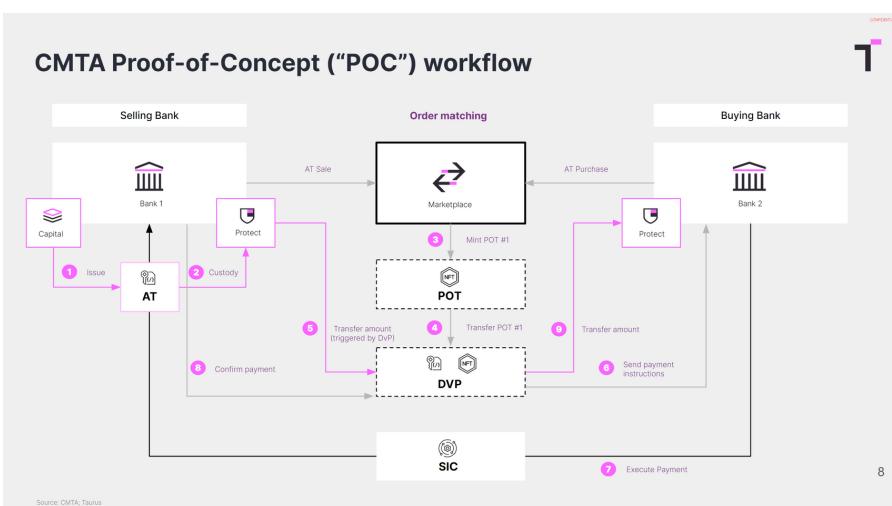
Automated Delivery vs Payment of a tokenized structured product transaction

- Credit Suisse, Pictet and Vontobel have conducted a proof of concept to issue tokenized investment products recorded on the Ethereum public blockchain
- Taurus' platform and CMTA's token standard have been used to issue, book and manage tokenized investment products
- Trades in tokenized securities are settled in fiat currency - the Swiss franc - through a smart contract and Targens' payment bridge DLT2Pay.
- Instruments were traded on BX Swiss, a Swiss regulated stock exchange
- The financial industry is taking advantage of the blockchain technology to increase security and efficiency and reduce complexity

### OVERVIEW

Full tokenization	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Primary market support	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Secondary trading	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Regulated marketplace	<input type="checkbox"/> T-dx.com	<input checked="" type="checkbox"/> Others
Blockchain	<input checked="" type="checkbox"/> Ethereum	<input type="checkbox"/> Others
Token standard used	<input checked="" type="checkbox"/> CMTAT	<input type="checkbox"/> Others
Asset class	<input type="checkbox"/> Equity	<input type="checkbox"/> Participation certificates <input type="checkbox"/> Debt <input checked="" type="checkbox"/> Structured products

### TOKENIZATION PROCESS



DvP: Delivery vs payment smart contract | POT: Payment Order Token smart contract | AT: Asset Token smart contract

The DvP smart contract works as an “escrow account”, The POT smart contract is used to monitor the payment of the purchase of the Asset Token (“AT”)

#### TAURUS

- Credit Suisse, Pictet used:
  - [Taurus-CAPITAL](#) for the issuance
  - [Taurus-PROTECT](#) for the servicing
  - [Taurus-EXPLORER](#) for the transfer.

#### targens

- The tokenised securities settlement in fiat currency (CHF) was made possible by [DLT2PAY](#) - from Targens -, a module that connects blockchain with the Swiss Interbank Clearing (SIC)



- These securities were traded on the platform of BX Swiss, a FINMA regulated Swiss securities exchange. The trades were settled bilaterally on the blockchain.

## 3. Tokenization use case 3: Debt



**Company name:** SCCF Structured Commodity & Corporate Finance and Horizon Capital AG

**Industry:** Trade Finance | Commodities

### KEY HIGHLIGHTS

Tokenization of private debt securities at the service of the real economy and renewable energy transformation

- SCCF, a Swiss-based trade finance expert founded in 2004, partnered with Taurus to issue a note in the form of ledger-based securities – a process commonly referred to as "tokenization".
- The note was issued to finance a loan to a commodity trading firm active in biofuels. The loan was used to purchase commodities.
- This demonstrates how tokenization can be used to optimize capital allocation and to finance the real economy in a more efficient way in comparison with the traditional paper-based alternatives.

### OVERVIEW

Full tokenization	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Primary market support	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Secondary trading	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Regulated marketplace	<input type="checkbox"/> T-dx.com	<input checked="" type="checkbox"/> Others
Blockchain	<input checked="" type="checkbox"/> Ethereum	<input type="checkbox"/> Others
Token standard used	<input checked="" type="checkbox"/> CMTAT	<input type="checkbox"/> Others
Asset class	<input type="checkbox"/> Equity	<input type="checkbox"/> Participation certificates <input checked="" type="checkbox"/> Debt <input type="checkbox"/> Structured products

### TOKENIZATION PROCESS

#### Step 1 - Issuance Taurus-CAPITAL



SCCF issued a 3-month note ("Tokenised Note") as ledger-based securities using Taurus-Capital. Said ledger-based securities were created using the CMTAT and recorded on Ethereum mainnet.

#### Step 2 - Trade T-DX



SCCF's Tokenised Note was then purchased by Horizon Capital AG. The trade was executed through Taurus' T-DX regulated marketplace for tokenized securities.

#### Step 3 - Lending SCCF

The proceeds of the sale of the Tokenised Note were lent by SCCF to a Swiss commodities trading firm active in biofuels.

# Conclusion

- Tokenization and digitization of securities have the potential to create new use cases and markets in private markets. Technology and regulation allow the transfer of shares of private companies as fast as a few seconds compared to weeks or months in their analog paper version.
- It is positive that an increasing number of financial institutions, especially systemically important financial institutions, have concrete and important projects in the space. It will take a couple of more years for widespread adoption to take place. In the meantime, Taurus believes the below areas represent priority areas to accelerate said adoption.
- Continue clarifying regulations in all key financial centers when it comes to recognizing, transferring and trading ledger-based securities. In particular remove the compulsory nature of Central Security Depositories and replace them by regulated custodians. Establishing standards in terms of smart contracts, KYC/AML is also paramount: they will reduce costs and foster trust from a supply (banks) and demand perspective (issuers). Finally, having on-chain FIAT currency issued by regulated financial institutions is the key catalyst needed for tokenized securities to thrive. We believe we will get there and are working with our clients and partners across the world.

## CONTACT

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