# ADAN

# "TOKENISATION"

*Memorandum* from Adan

# Contents

## Introduction

Although increasingly widespread, tokenisation remains an often obscure and poorly understood concept, frequently confused with other concepts. It therefore seems necessary to clarify this innovation by providing a precise definition in order to fully grasp its prospects and challenges. The notion of tokenisation encompasses many different realities, which can lead to a certain lack of understanding on the part of the various parties involved. The aim of this educational guide is to clarify tokenisation for the ecosystem, regulators and the general public.

Adan's aim is to **(i)** draw up a global overview of tokenisation; **(ii)** demonstrate the paradigm shift it is bringing about; and **(iii)** highlight its potential for employment and economic development at French and European level.

More specifically, the Association hopes that this guide will not only help people to grasp the potential of tokenisation, but also to understand its regulatory framework in order to ensure its smooth and secure integration into the economic world.

The studies carried out in the field of tokenisation highlight its complexity and underline the importance of an in-depth understanding of the legal, economic and technological implications. This work is a continuation of the work carried out by our institutional partners, whose contributions enrich our collective understanding of tokenisation.

Initiatives such as the guide issued by the Association Française de la Gestion Financière (AFG) on the tokenisation of fund units, and the work carried out by Paris Europlace on the Pilot Regime, are particularly enlightening. These resources provide a valuable framework for better understanding tokenisation and its implications. All the studies highlight the complexity of tokenisation and the need for a multidisciplinary approach to grasp all its nuances, in order to maximise the benefits while minimising the risks.

To complement these thoughts, projections such as those in the BCG x GFMA report estimate that the size of the tokenisation market could reach around $17 trillion by 2030, underlining the significant opportunities it represents.

> The aim of this guide is to provide a clear and comprehensive overview of tokenisation, addressing its various aspects and presenting its potential benefits and challenges. It also aims to offer recommendations for the successful adoption of tokenisation, building on existing best practice and regulatory frameworks. In addition, the Adan hopes that this guide will serve as an essential resource for players in the financial ecosystem, regulators, investors and the general public, in order to promote a common understanding and harmonious adoption of tokenisation in the economic and financial landscape.

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# 1.  Defining tokenisation

## 1.1.  What tokenisation is not

In order to define tokenisation, we first need to put it into perspective with related concepts that are often confused or used interchangeably. Two concepts deserve particular attention: securitisation and fractionation.

- **Securitisation:** Securitisation is defined by the EU Securitisation Regulation[1] as an operation whereby a lender converts a pool of loans or receivables into tradable securities. By pooling different loans (e.g. real estate or consumer loans), a credit institution can organise them into risk categories suitable for different investor profiles, thus offering greater accessibility and risk diversification. Although securitisation focuses on receivables and loans, it can be extended to any asset that generates predictable cash flows.

- **Asset splitting:** asset splitting allows you to acquire portions of an asset, making investment accessible even with limited capital. This democratises investment in expensive assets, making it possible to diversify a financial portfolio.

  This method can take various forms. For example, programmed investment *via* brokers enables investors to gradually buy fractions of an asset until they become full owners. Other models include exposure to changes in an asset through derivatives, where the investor does not own the asset but becomes a creditor of the issuer of the product.

  Under Act 2024-537 of 13 June 2024 aimed at increasing business financing and the attractiveness of France, the Government has been given the power to legislate by ordinance to create a system for splitting financial instruments. The aim is to enable a larger number of shareholders to benefit from greater opportunities to invest in the stock market, by regularly investing small amounts according to their means.

While securitisation, asset-splitting and tokenisation have some points in common, notably the transformation of assets into more accessible and tradable forms, these three concepts are not the same thing. Securitisation and asset-splitting, which are effective in diversifying risk and democratising access to investment, rely on traditional financial infrastructures. Conversely, thanks to *blockchain*, tokenisation considerably improves the accessibility and liquidity of assets, by making them more easily negotiable.

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[1] Regulation (EU) 2017/2402 of the European Parliament and of the Council of 12 December 2017 creating a general framework for securitisation and a specific framework for simple, transparent and standardised securitisations, and amending Directives 2009/65/EC, 2009/138/EC and 2011/61/EU and Regulations (EC) 1060/2009 and (EU) 648/2012, amended by Regulation (EU) 2021/557 of the European Parliament and of the Council of 31 March 2021 amending Regulation (EU) 2017/2402 establishing a general framework for securitisation and a specific framework for simple, transparent and standardised securitisations to support recovery from the COVID-19 crisis.

## 1.2. What tokenisation is

Many projects in the Web 3 ecosystem claim to be tokenisation projects, often using it as a commercial or marketing argument. However, simply digitising assets is not enough to achieve true tokenisation. Similarly, using the *blockchain* for transactions does not necessarily constitute tokenisation.

- **The tokenisation environment**

To fully understand tokenisation, it is essential to understand the legal and technical environment in which it is taking place. To make complex concepts accessible and understandable to a non-specialist audience, educational definitions can be used[2] . They will help you to grasp the differences and specificities of each concept in the *blockchain* and crypto-asset ecosystem.

- **Web 3**: evolution of the Internet (known as Web 2). Web 3 ecosystems, supported by blockchain technologies, are interconnected networks of applications and communities built on a decentralised basis. Web 3 recreates a digital economy based on tokens.

- ***Distributed ledger* technology (DLT)**: a data ledger maintained in a decentralised manner, where information is shared and duplicated across a network of users. The data is not stored in a giant, centralised database; each participant holds a synchronised, up-to-date copy. Users can see all changes and who made them, providing greater transparency and making fraud and manipulation more difficult.

- **Blockchain**: type of DLT that stores information in the form of a chain of blocks. New blocks of data added chronologically to the register include a unique digital fingerprint called a hash (an algorithm), the creation of which depends on the hash of the previous block and the data it contains. As each block cannot be modified without manipulating the hash of all the blocks in the chain, modifying the register is made more difficult each time a new block is added. If a block of data is modified, the inconsistency between the stored hashes will allow the network to detect and prevent it. This makes the system more resilient to manipulation and attack. *Blockchain* is a specific form of distributed ledger technology, characterised by a concatenated and immutable data structure, where each block contains a set of transactions verified and validated by a network of nodes. Although all *blockchains* are DLTs, not all DLTs *are blockchains*. Other types of DLT may use different data structures, such as directed acyclic graphs (*"DAGs"*).

- **Public blockchain**: a public *blockchain* is one that does not require authorisation to access (*"permissionless blockchain"*). Any user can read the register and take part in the smooth running of the network, provided they comply with the consensus rules. A public *blockchain* is characterised by its resilience and high degree of decentralisation.

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[2] The following definitions are taken from the Adan glossary.

Like the Ethereum network, this type of blockchain can be open (Ethereum Mainnet) or closed (Ethereum test networks). It is also possible to create situations where authorisation is required, such as controlling access to data.

- **Private blockchain**: a private *blockchain* is a *blockchain* deployed in a private setting, requiring permission to access it ("*permissioned blockchain*"). It enables businesses to guarantee a certain level of security, privacy, compliance and performance. Only predefined users have the right to read the register and participate in the operation of the network. The *Proof-of-Authority* protocol is often used, but a private *blockchain* does not necessarily involve the use of digital assets.

- **Token (or crypto-asset)**: digital representation of a value or right registered on a blockchain. This value may be an entirely virtual object, the digital twin of a physical object or, like a password, enable its holder to exercise an economic, governance and/or consumer right. A token can thus be a crypto-asset for financial use, but also the representation of brand loyalty points, a subscription (e.g. the right to view 72 hours of streaming content), or even a voting right. They are very often issued by start-ups wishing to raise funds from the public in exchange for tokens that can then be exchanged for a product or service, or resold. They include protocol tokens (cryptocurrencies), *utility tokens, security tokens, non-fungible tokens*, etc.

- **Non-fungible token (NFT)**: a type of token that is unique and non-fungible. An NFT therefore has unique attributes that prevent it from being exchanged indiscriminately or replaced by another. NFTs can represent an infinite number of digital assets (an entirely digital work of art), real-world assets (a physical work of art, a ticket to an event, a certificate for a luxury item, etc.) or rights (a vote, membership of a club, property rights, an advantage in a video game, etc.). Given the inherent characteristics of the blockchain technologies on which they are based, NFTs offer proof of authenticity and ownership.

- **Smart Contract:** computer programme based on blockchain technologies, coded to automatically execute an action when predefined conditions are met (for example: if it rains for more than six days, trigger aid to farmers; or if song X is listened to, pay royalties to Y; if the individual provides proof of majority, open access). They can be used in a wide variety of fields and for a wide variety of purposes. These programmes improve the efficiency and security of transactions, while eliminating the need for intermediaries and reducing the risk of error or fraud.
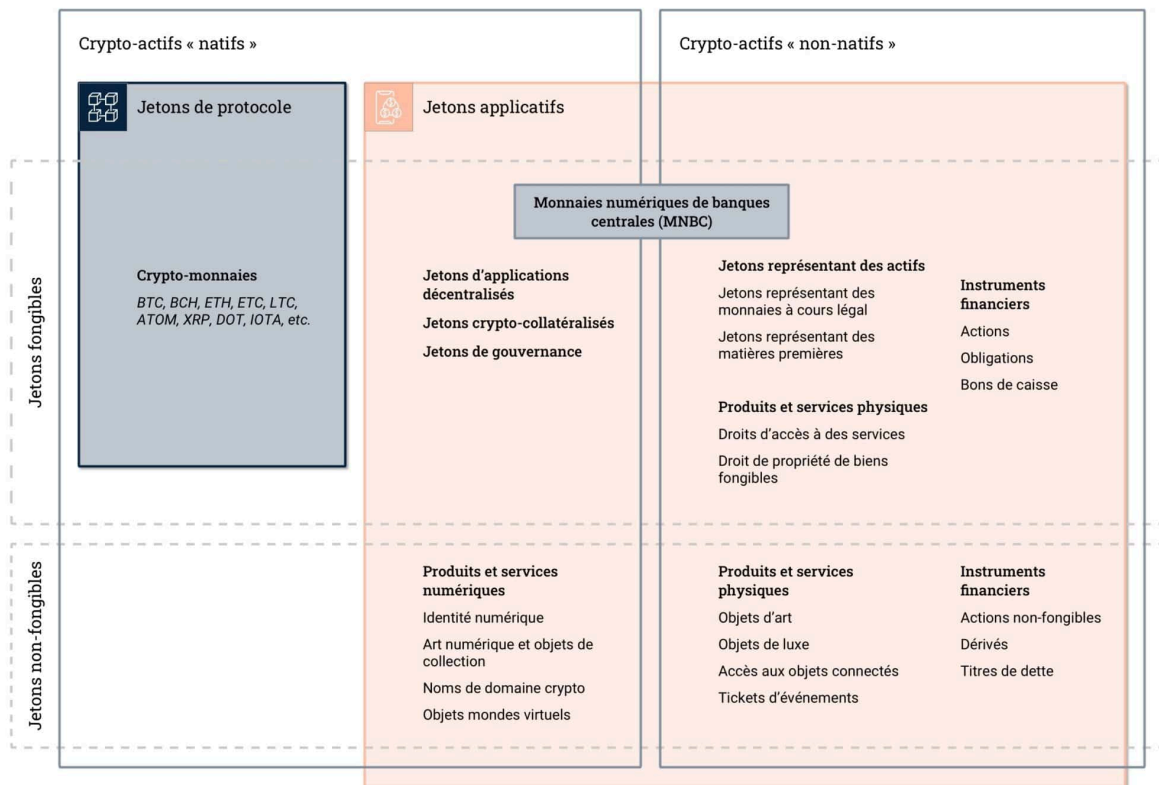
Source (fr): Adan

● **The definition of tokenisation**

Computer code is at the heart of tokenisation. An asset on a *blockchain* is represented by computer code. This code is designed to create specific structures on the *blockchain*, such as *smart contracts* that define the rules and functions of the asset. When an asset is tokenised, it is encoded in the form of a digital token that represents ownership or a right over an underlying asset. For example, a token can represent a share in a property, a work of art, or even a unit of value such as a crypto-asset. The token is then stored on the *blockchain*, where it can be transferred, exchanged or managed according to predefined rules.

The computer code that makes up the tokens is designed to be immutable once recorded on the *blockchain.* This means that the rules initially defined cannot be changed, ensuring greater integrity and reliability of transactions. This immutability is guaranteed by the *blockchain*'s consensus mechanism, which checks and validates each transaction before it is added to the public register. On the other hand, it is still possible to retain a degree of flexibility: while the rules cannot be changed *retrospectively*, the same cannot be said of the conditions under which they are applied.

Tokenisation is the process of creating tokens representing an asset on a DLT such as *blockchain*. Tokens can embody the information and rights associated with the underlying asset. Any object, property or asset can be tokenised as soon as ownership is registered or the asset is represented on the *blockchain*. In other words, "everything is technically tokenisable".

This capability consists of creating a digital equivalent in the form of a token for physical or financial assets, enabling them to be managed, transferred and exchanged on the *blockchain*. This includes a variety of objects, from real estate to works of art to shares.

By registering these assets on the *blockchain*, we give them new properties. We can give them a value and increase their exchange and marketing capacity. In other words, once tokenised, each asset can benefit from the advantages of blockchain, such as decentralisation, transparency and greater liquidity. This flexibility, which means that everything in commerce is technically tokenisable, opens up new perspectives in finance, investment and asset management, making these processes more accessible and efficient. Tokenisation can take place as early as the primary market, in which case they are referred to as "*native* tokens" ([3]), or be based on pre-existing assets, known as "*non-native to*kens" ([4]).

**Finally, tokenisation stands out for its ability to offer native asset splitting and increased traceability thanks to *blockchain* technology**. It is also possible to tokenise securitised assets to make them more widely available. Tokenisation can therefore be the final stage in the securitisation process to create tokens representing the securitised asset. This same asset can be fractionalised natively to make it accessible to as many people as possible and improve its liquidity.

In this sense, the European Pilot Scheme Regulation defines the tokenisation of financial instruments as the digital representation of financial instruments on distributed ledgers or the issuance of traditional asset classes in a tokenised form to enable them to be issued, stored and transferred on a distributed ledger.

| Definition of tokenisation |
| :---: |
| **Tokenisation is the process of transforming an asset into one or more freely tradable securities on a DLT.** |

Example:

A bank has a portfolio of mortgage loans and wishes to release capital tied up in these loans while continuing to receive income. It therefore converts this loan portfolio into financial securities, with each security representing a share of the total loan portfolio. The bank decides to tokenise these securities on a *blockchain*, with each token created representing a specific fraction of a financial security in the portfolio. Each token contains information about the

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[3] **Native tokens**: initially issued *on-chain* as tokens through a primary offering, with ownership of the token recorded on a distributed ledger or *blockchain*. The token represents ownership of an asset that exists exclusively within the crypto-asset ecosystem and can be traded or pledged as collateral on a DLT-powered secondary market or within a DLT-powered application. At no point has ownership of the token been registered on a traditional ledger.

[4] **Non-native tokens**: the tokenisation of pre-existing traditional assets refers to the process of transforming an asset that was initially issued *off-chain* (i.e., an issue outside the *blockchain*, as opposed to "*on-chain*") through a primary or secondary offering and recorded as an accounting entry on a traditional register, such as a central securities depository, into a token. The token represents the digital ownership of the *off-chain* asset, incorporates the rights of the asset and can be traded or pledged on a DLT-powered secondary market or within a DLT-powered application. The pre-existing traditional asset, which is held by a custodian within a special purpose vehicle, continues to exist *off-chain* in the "real world", but also exists within the crypto-asset ecosystem, with changes in ownership recorded on a distributed ledger or *blockchain*.

underlying loan, its risk, its expected return and the share of the asset it represents. These tokens are distributed to investors *via* the *blockchain* and are stored directly in each investor's *wallet*. These tokens can be traded on a marketplace or directly from peer to peer.

# 2. Types of assets concerned by tokenisation

## 2.1. Moveable assets excluding financial instruments

The tokenisation of movable assets[5] (excluding financial instruments) represents an innovation in the way we own, trade and invest in goods. It facilitates access to markets that were previously inaccessible or inefficient. Various types of movable asset can be tokenised, both tangible and intangible.

### 2.1.1. Property, plant and equipment

| Assets or tangible property | A concrete example | Added value |
|---|---|---|
| ● **Property** | Focus below. | Fractional ownership, increased liquidity, greater accessibility for small investors. |
| ● **Luxury items** | Luxury watches, jewellery and leather goods. | Access to a global market, improved security and traceability to combat counterfeiting, possibility of fractionation. |
| ● **Works of art and collectors' items** | Paintings, sculptures and rare coins. | Fractional ownership, easy access for investors, conservation and traceability |
| ● **Stocks and inventories** | | Optimised stock management, improved liquidity, accurate tracking of goods movements. |
| ● **Documents** | Supply chain (invoices, documentary credit, etc.) Freight transport. | Adan believes that improving transparency can encourage banks to provide more funding for working capital. Banks can increase the quantity and size of loans, which generates additional revenue, all other things being equal. However, tokenisation of inventory may also reduce the need for banks to carry out physical audits, which could reduce a supplier's financing costs. Example: after six months of deploying the platform, Walmart Canada has processed more than 200,000 invoices, reduced disputes by around 70% and cut the time |

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[5] Often referred to by the industry as RWA, for Real World Assets.

| | | taken to approve carrier invoices from 6 to 8 weeks to less than a week. |
|---|---|---|
| ● **Heavy vehicles and equipment** | Cars, industrial machinery. | Split ownership, easier access to investment, improved asset management and traceability. |

This table highlights how tokenisation can transform the management and investment of various types of tangible assets, offering significant benefits such as fractionation, increased liquidity and improved traceability.

### 2.1.2. Intangible assets

Exploration of other asset classes that cannot be monetised or securitised because of their technical, operational and regulatory complexity. Adan lists here the different types of asset or intangible value that have financial potential as soon as they are 'listed' or 'admitted to trading', open to investment. These assets become liquid when they can be traded on a market supported by an infrastructure. The *blockchain* comes into play here by facilitating this process, opening up new prospects for monetisation that have not been explored before.

| Assets or intangible property | A concrete example | Added value |
|---|---|---|
| ● **Intellectual property rights** | Nike generated over $93 million in secondary sales of non-fungible tokens (NFT) through the tokenisation of royalty streams. | DLT, *smart contracts*, tokenisation and fractionation allow emerging artists to access financial markets by issuing tokens to raise capital. Enabling musicians to self-finance projects and individual investors to invest in the future success of an individual artist. |
| ● **Certificates of authenticity** | The California Department of Motor Vehicles (DMV) tokenization project is an example of how US businesses and state and federal agencies are using *blockchain-based* solutions to drive efficiency and reduce costs, Bank of America said.<br><br>The DMV will issue vehicle titles as NFTs with ownership immutably recorded on a private (*forked*) version of the Tezos *blockchain*. | Access real-time title issue updates, initiate ownership transfers and verify vehicle ownership via a consumer-facing application.<br><br>Additional features could be added, such as the ability to record repairs in the NFT, to use *stablecoins* (crypto-assets whose value is stable because they are backed by a pool of assets) as a means of payment for transfers of atomic securities. |

| | | |
|---|---|---|
| ● **Rights of use** | | Split rights, easier access for investors, traceability and optimised rights management |
| ● **Licences and franchises** | Ant Group, a subsidiary of Alibaba, has launched AntChain, a digital copyright services platform. More than 100 minutes of digital records, including transaction details, copyrights and ownership certificates, are uploaded daily to the registry. | Increased liquidity, possibility of splitting, transparency and efficiency of transactions. |
| ● **Reputation and influence** | Followers on social networks, influencers. | Security and immutability of records, transparency, easier management and improved stakeholder confidence. Direct monetisation of influence, traceability and transparency, access to a global market for investments. |

This table shows how tokenisation can bring significant benefits to intangible assets, offering opportunities for fractionation, increased liquidity and better management.

## 2.2.   Financial instruments

The tokenisation of financial assets is now being rolled out on a massive scale: more than $10 billion worth of tokenised bonds have been issued over the past decade[6] . Launched in 2021, Broadridge's Distributed Ledger Repo ("DLR") platform now carries out $50 billion of repo transactions every day[7] . There are also currently approximately $1.7 billion in tokenised US Treasuries[8] and over $12 billion in tokenised private loans .[9]

Tokenisation can take place on the primary market ("*native tokens*") or be based on pre-existing assets ("*non-native tokens*").

### 2.2.1.   Listed assets

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[6] Notable recent issuers include the World Bank, Siemens and the city of Lugano. By way of comparison, the global notional amount outstanding is $140 trillion.
https://www.mckinsey.com/industries/financial-services/our-insights/from-ripples-to-waves-the-transformational-power-of-tokenizing-assets#/
https://www.icmagroup.org/market-practice-and-regulatory-policy/fintech-and-digitalisation/fintech-resources/tracker-of-new-fintech-applications-in-bond-markets/
[7] https://www.broadridge.com/article/capital-markets/dlr-transacts-1-trillion-a-month
[8] https://app.rwa.xyz/treasuries
[9] https://app.rwa.xyz/private_credit

The result of a proposal by the European Commission as part of the "digital finance" legislative package[10] , the European regulation known as the Pilot Regime came into force on 23 March 2023. This small legal revolution establishes a transitional regulatory framework to adapt existing regulations for market infrastructures wishing to use *blockchain* and trade tokenised listed financial securities. This new category of players may be exempted from certain regulatory requirements on financial services[11] where they are incompatible with *blockchain*. Any request for exemption must, however, be justified and offset by *ad hoc* measures. This is the first time that a directly applicable piece of European legislation has introduced derogations from existing regulations. The aim of this experiment is to allow blockchain to be tested while protecting investors, the integrity of the financial markets and financial stability.

The Pilot Scheme therefore recognises three new players. They form the category of "DLT market infrastructures". There is the "MTF DLT", a multilateral trading facility which only admits DLT financial instruments to trading, the "SR DLT", a settlement system which settles transactions in DLT financial instruments against payment or delivery and which allows the initial registration of DLT financial instruments or the provision of custody services for DLT financial instruments. Finally, the "DLT SNR", a particularly new player authorised to provide the services of both a multilateral trading facility and a settlement system for DLT financial instruments.

The Pilot Regime concerns tokenised financial instruments, which it defines, with reference to MiFID 2, as financial instruments issued, recorded, transferred and stored using distributed ledger technology. The regulation lists the DLT financial instruments to which it applies: equities, bonds and other debt instruments, as well as UCITS units. The aggregate market value of all DLT financial instruments that are admitted to trading or registered may not exceed €6bn per DLT market infrastructure at the time of admission to trading or at the time of initial registration of a new DLT financial instrument. After admission, the ceiling is raised to €9 billion per infrastructure. If the limit is exceeded, a strategy for transition to a traditional infrastructure must be activated to reduce the number of tokenised financial instruments in circulation in order to ensure financial stability.

A decree has been issued adapting French securities law to the Pilot Regime Regulation. Its main contribution is to specify that securities registered in DLT by a DLT market infrastructure must be in bearer form[12] . Until then, only registered securities were authorised under French law. However, an intermediary may be entrusted with their administration by their owner. Another original feature is that the platform can also admit legal entities and individuals to trade on their own behalf as members or participants . [13]

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[10] https://finance.ec.europa.eu/publications/digital-finance-package_en.
[11] Notably Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments (MiFID 2), Regulation (EU) 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments, and finally Regulation (EU) 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and central securities depositories (CSDRs).
[12] Historically, these financial securities were issued in the form of paper certificates whose bearer was presumed to be the owner. Finally, the tokenisation of securities is the opposite of the immobilisation of bearer securities, with tokens being digital certificates rather than paper certificates. In a tokenised world, the holder has private data in the form of a cryptographic key rather than a paper certificate.
[13] Traditional MTFs may only admit as members or participants investment firms, credit institutions or other entities as long as they have certain capacities, skills and resources.

### 2.2.2 Unlisted instruments

Article 120 of the Sapin 2 Act 2016-1691 of 9 December 2016 paved the way for the representation and transmission of financial securities using *blockchain*. As early as 2017, Order No. 2017-1674 of 8 December 2017 and its implementing decree No. 2018-1226 of 24 December 2017 enabled the representation and transmission of certain financial securities using a *blockchain* (then presented as "a shared electronic recording device", a "DEEP". This term is deliberately broad and neutral in order to remain open to different protocols and not to exclude future technological developments). From now on, registration in a DEEP will take the place of an account registration. However, this only applies to unlisted securities that are not admitted to trading in a central depository and are not delivered in a financial instrument settlement system. In other words, only registered securities not admitted to the operations of a central depository. This new method of registering financial securities represents a genuine alternative to book-entry registration and produces the same effects. It does not introduce any new obligations and does not reduce the existing guarantees concerning the representation and transmission of the securities concerned.

Regulation of the uses of *blockchain* has once again turned its attention to unlisted assets. For example, the Pacte Act No. 2019-486 of 22 May 2019 introduced a new category of asset in France: digital assets. Two types of asset make up this category: tokens (apart from financial instruments) and crypto-currencies. The Pacte Act also created the status of digital asset service provider ("PSAN"), requiring registration based on the activities carried out. These new professionals must comply with a whole body of rules in order, in particular, to protect the interests of customers. Inspired by the Pacte Act, the MiCA regulation[14] aims to standardise European names and rules relating to crypto-assets and providers supplying services on crypto-assets. In October 2024, France adopted an ordinance adapting to MiCA[15] to ensure consistency between national legislation and the new European framework. It provides a clearer framework for French players in order to strengthen the competitiveness of the French tokenisation ecosystem.

Integrating *blockchain* into the value chain redefines the boundaries between listed and unlisted securities. Take the example of a native issue of shares in an unlisted company. Thanks to *blockchain*, these shares can be listed directly on a market platform using this technology, to create the functions of a primary and/or secondary market comparable to those of a traditional stock exchange.

### 2.3.    Property assets

Real estate tokenisation is attracting considerable attention and interest. It represents a genuine revolution in the real estate sector, promising to democratise access to high-value investments and open up new avenues for liquidity and asset management. It is attracting a great deal of interest because of its ability to democratise access to property investment and

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[14] For Markets in Crypto-Assets: EP and Cons. EU, Reg. (EU) 2023/1114, May 31, 2023, on markets in crypto-assets, and amending Regulations (EU) 1093/2010 and (EU) 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937. The Regulation has been in full force since the end of 2024.
[15] Ordinance 2024-936 of 15 October 2024 on crypto-asset markets.

inject liquidity into a traditionally illiquid market. Several models can be envisaged to illustrate the potential of tokenisation applied to the real estate market.

### 2.3.1. Real estate

The first use case for property tokenisation involves breaking up a property into smaller units, represented by tokens on a *blockchain*. This approach aims to broaden investment opportunities, even for individuals with limited financial resources. By making it possible to buy fractions of a property, tokenisation makes property investment accessible to a wider audience, thereby diversifying portfolios. However, despite these promising advantages, current French law does not yet recognise property tokens as equivalent to traditional title deeds registered by notaries. Real estate transactions still have to be recorded in land registers in order to be enforceable. In the same way as for listed financial securities, the legislator could adopt a pilot approach by setting up a transitional regime to test real estate tokenisation solutions while maintaining a high level of investor protection. As French law currently stands, ownership of a property is determined by its registration in the land registry, not by the holding of a token on a *blockchain*. Regulatory changes would therefore be required, in particular to enable distributed registries to be recognised as the official medium for registering property titles.

### 2.3.2. Property companies

To overcome the obstacles identified above, another model exists. It involves tokenising the capital of a company that holds real estate assets. This process offers a number of advantages, including the ability to split investments, making expensive property more accessible to small investors and increasing the liquidity of investments.

Tokenisation is transforming the investor experience, offering tangible benefits through the concrete example of real estate. By tokenising real estate assets, investors can buy shares in a valuable property, such as a prestigious office building or a residential complex, with a much lower initial investment than would normally be required for a traditional investment. This democratises access to investments that were previously inaccessible to most, and also increases the liquidity of the property market, enabling investors to sell their shares more quickly and easily. Tokenisation creates a more dynamic market, reduces transaction costs and increases the flexibility of investment portfolio management.

# 3. Why is tokenisation important?

Tokenisation is a major phenomenon that is shaping the future of the global economy. One of the main reasons for adopting this innovation is to reduce annual transaction processing costs, estimated at between USD 17 and 24 billion according to a 2015 Broadridge study. Tokenisation is therefore a crucial issue of economic and technological sovereignty.

Faced with the acceleration of solutions developed by major American, British and Asian banks such as JP Morgan, Goldman Sachs and HSBC, Europe needs to position itself strategically. These institutions occupy several positions in the value chain, both upstream and downstream, participating in the creation and operation of infrastructures based on distributed ledger technology and structuring various financial instruments. They also offer a wide range of products including payments and settlement assets, as well as tokenised bonds and commodities.

**Adan believes that to reassert its technological and financial sovereignty, Europe, and France in particular, must capitalise on its strengths.** Although the continent is home to many innovative start-ups and fintechs, endowed with talent and considerable potential, the holders of tokenised projects tend to establish themselves outside France or Europe. It is therefore imperative to create a favourable environment to attract and retain these projects, by supporting innovation and adapting regulatory frameworks to encourage the adoption of tokenisation. Tokenisation is not just a technological advance, but a strategic lever for reducing costs, improving efficiency and strengthening Europe's sovereign position in the global economic landscape. The future of the economy depends on the ability of the regions to adopt and integrate these new technologies proactively and securely.

In order to fully understand the importance of tokenisation and its impacts, the analysis will focus on the specific benefits it brings to different stakeholders.

## 3.1. Advantages for the issuer

Issuers face a number of issues in their search for financing and throughout the life cycle of their issues. Many SMEs are too small to access the financial markets, and their limited equity capital restricts banks' ability to finance them. Knowledge of the holders of securities is often incomplete, making it difficult for companies to trace them. This makes it difficult to optimise the processing of conditional securities transactions, to manage general meetings or simply to deploy more regular and targeted communication with shareholders or creditors. More generally, current post-trade operations still require numerous reconciliation operations between counterparties, generating costs and operational risks.

The emergence of *blockchain* is ushering in a new era of market digitisation. This era is characterised in particular by gains in efficiency and a greater ability to share information about investors and the characteristics of securities issued and traded.

Digital securities offer a number of advantages over traditional securities when it comes to raising capital (in addition to enabling the issuer to participate in market innovation):

- **Potential global reach**: Securities issued on a *blockchain* can be bought and sold around the world, giving issuers the opportunity to reach a wider and more diverse audience, while taking into account the specific constraints of the issuance programmes and target investors.

- **Possibility of providing detailed information via the smart contract for creating securities**: This feature makes it possible to provide in-depth information on the sustainability characteristics of the proposed investment, responding to the growing demand from investors for information on the ESG impact of their investments.

- **Permanent identification of holders of issued securities**: The *blockchain* makes it possible to automate the monitoring of securities transactions and to identify the custodians and investors concerned at all times.

**Potential reduction in transaction processing costs thanks to** :
  o The elimination of costs linked to reconciliation operations between counterparties.
  o The programmability of the most common securities transactions (such as payment of issue proceeds, distribution of coupons/dividends, repayment of principal, etc.).
  o More efficient management of default triggering and resolution operations, leading to a reduction in accounting errors.

### 3.1.1. Reducing costs

One of the main benefits of tokenisation for issuers is the reduction in operational and administrative costs through the use of smart contract technology. By making tokenised assets programmable, smart contracts enable a new level of control and automation, greatly simplifying asset management and reducing associated costs.

*Smart contracts* incorporate functions such as *whitelisting*, *freeze/unfreeze* and *burn* and *mint* of tokens. These automated functions reduce the need for complex reconciliation processes and cut management costs. Automation also facilitates routine operations such as capital increases, clawbacks, stock splits and the payment of dividends on shares.

Infrastructure powered by distributed ledger and *blockchain* technologies translates into significant efficiency gains and cost reductions. By eliminating the need for intermediaries and enabling the automation of administrative and operational processes, the implementation of smart contracts can rapidly transform markets. For example, demand deposits and tokenised currencies enable real-time settlement, eliminating manual processes and reducing settlement times and costs.

Potential disintermediation can also free up significant financial resources. Banks, for example, can release around 4 billion dollars of funds held in accounts with correspondent banks and reallocate them to yield-generating assets.

Tokenisation also improves the liquidity and accessibility of assets, enabling a better allocation of capital. Efficiency gains reduce manual processes and business expenses, facilitating the emergence of new products and applications.

Tokenisation has led to a number of financial innovations, including :

- Financial products and applications for people on low incomes.
- Exposure of individual investors to alternative assets such as private equity, commercial property and prime works of art.
- Companies that buy carbon credits on a liquid secondary market to offset their contribution to climate change.
- Intraday settlement of repurchase agreements (repos).

Tokenisation offers issuers significant advantages in terms of cost reduction, process automation, efficiency gains and the creation of new financial products. These advantages help to make issuers more competitive.

### 3.1.2. Democratisation of financial infrastructures

One of the major advantages of tokenisation for issuers is the democratisation of financial infrastructures. Markets based on DLT infrastructures should be able to begin to emerge thanks to the implementation of the Pilot Scheme. The creation of liquidity should be gradual, with different pricing methods for tokens: liquidity events or auctions for the least liquid assets, and continuous trading for the most liquid assets, such as pre-IPO market segments. By generating this liquidity, tokenisation should also revive local economic dynamism by facilitating innovation and SME financing. We can therefore hope to see the re-emergence of regional stock exchanges, where companies of all sectors and sizes can obtain financing, as was the case until the 1990s.

Respecting the local regulatory framework and the company's prospectus, tokenisation enables issuers such as SMEs to access a much wider market of investors. It also makes listing easier for smaller companies, giving them an opportunity to reach a wider audience without the traditional red tape.

Democratising access to capital markets for SMEs means streamlining processes, increasing accessibility for retail investors and reducing costs through operational efficiency. This gives SMEs better access to finance by increasing the number of potential investors and the pools of capital available, leading to a more efficient allocation of capital and increased competition for incumbents in markets with high initial capital requirements.

Tokenisation not only opens the doors of financial markets to a wider range of businesses, but also fosters a more inclusive and dynamic environment for innovation and economic growth.

### 3.1.3.  Access to a wider community of investors - improved liquidity

Tokenisation offers issuers the significant advantage of access to a much larger community of investors, while improving the liquidity of their assets. Unlike traditional markets with limited opening hours, digital marketplaces operate 24 hours a day, 7 days a week. This constant accessibility allows issuers to benefit from continuous access to liquidity, facilitating transactions at any time.

The ability to operate without interruption allows issuers to adapt quickly to changing market conditions, optimise their portfolios and take advantage of new investment opportunities. By transforming traditionally illiquid assets into liquid assets, tokenisation fosters the emergence of more efficient secondary markets. This increases investment opportunities for retail and institutional investors in alternative investments such as private equity, real estate, prime art and carbon credits, while stimulating the formation of more liquid and efficient primary and secondary markets.

Reducing barriers to entry for retail investment in alternatives is another benefit of tokenisation. For example, exposure to private equity for even wealthy retail investors is often hampered by high barriers, limiting access to more than 99% of companies globally and in the US that are privately held. This limitation leads to a risk of client concentration for private equity funds, illiquidity in the secondary market and inefficient capital allocation.

Tokenisation also enables a holistic analysis of structured finance products. Although securitisation transforms illiquid and long-dated assets into liquid assets, it has its drawbacks, notably a lack of transparency about the collateral underlying securitised assets, which reduces investors' ability to analyse the creditworthiness of borrowers. Data transparency and traceability are therefore crucial to improving this analysis.

In addition to these benefits, tokenisation brings increased efficiency in the exchange and settlement of assets, reduces operational and financing costs, and enables the programmability of asset settlements. It is transforming public and private markets, increasing the liquidity of previously illiquid assets, and enabling a more efficient allocation of capital. It also increases investor accessibility and opens up the possibility of creating new products, thereby contributing to the financialisation of the economy. In short, tokenisation represents a transformative advance for issuers, offering improved liquidity, greater accessibility for investors and a host of other benefits that optimise financial operations and foster economic innovation.

| | Private securities V1.0 - traditional | Private securities V2.0 - tokenized | Public securities (listed) |
|---|---|---|---|
| **1** Securities format | ❌ Paper<br>✔ Custom | ✔ Electronic<br>✔ Disintermediated<br>✔ Programmable | ✔ Electronic<br>✔ Intermediated<br>✔ Standardized |
| **2** Booking & settlement | ❌ Paper, manual<br>❌ Non-bankable | ✔ Electronic, instant<br>✔ Bankable or not | ✔ Electronic, T+2<br>✔ Bankable |
| **3** Trading | ❌ Manual (via bulletin board) | ✔ 24/7 electronic | ✔ Electronic (via stock exchanges) |
| **4** Price discovery / liquidity | ▮ (low) | ▮▮▮ (medium-high) | ▮▮▮ (high) |
| **5** Costs | ▮ (low) | ▮▮ (medium) | ▮▮▮ (high) |
| **6** Public transparency requirements | ▮ (low) | ▮▮ (medium) | ▮▮▮ (high) |

Source: Taurus

While tokenisation offers increased opportunities in terms of liquidity, this remains conditional on the existence of an active market, favourable regulation and easy access for investors. Without these elements, a tokenised asset may remain as illiquid as its traditional equivalent.

### 3.2. Advantages for investors

Tokenisation offers many benefits to investors, fundamentally transforming the way financial and non-financial assets are accessed and managed. But it is only once the regulatory framework has been clarified that a token offers the same rights as traditional securities. Tokenisation then enables investors to benefit from a simplified digital experience, from the acquisition of the token through to its management. In this way, tokenisation broadens the range of investors by simplifying their access.

**Tokenisation offers a number of tangible advantages for investors:**

- The ability to trade 24/7, independently of traditional financial market opening hours, is one of the most significant. Intraday transactions and settlements also enable more agile asset management. Tokenisation is also improving the handling of collateral, both for emerging markets with less liquid collateral and for securities financing and repo settlement.

- New asset management tools are also emerging through the use of tokenised assets. Investors can use them to interact with applications connected to a *blockchain* via smart contracts, offering the potential for 'composability' with other financial functions. These innovative new use cases benefit both the asset issuer and the investor, including access to decentralised liquidity reserves or collateralisation of assets for borrowing purposes.

- Transparency is another major advantage. Transactions on a *blockchain* are recorded securely and can allow investors to track the movements of tokens in order to verify the accuracy of the information. Efficiency gains in information sharing are also important, as blockchain facilitates communication between counterparties and intermediaries in pre- and post-trade processes, eliminating the need for reconciliation and reducing transaction processing costs.

- Lastly, the cost of acquiring data is significantly reduced. The direct integration of data, particularly extra-financial data, by the issuer into the smart contracts used to create tokens, reduces data acquisition costs for investors. These numerous advantages for investors promise to transform markets and open up new investment opportunities.

### 3.3. Benefits for the financial infrastructure

#### 3.3.1. Instant DVP

Tokenisation enables "delivery versus payment" (DvP) transactions to be carried out instantaneously using the atomic swap principle. In the financial sector, DvP ensures that securities are only transferred if the corresponding payment is made. On a *blockchain*, this capability exists natively: the transfer of value can take place within the same transaction of token against token, known as a *swap*.

In a DvP transaction, we speak of a *"cash leg"* and an *"asset leg"* within one and the same operation, offering instant settlement in real time as opposed to deferred settlement.

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**Exampl**

In June 2021, Goldman Sachs joined Onyx and exchanged tokenised treasury bills for JPM Coin, reducing settlement time from several days to just 3 hours and 5 minutes, as well as interest charges, illustrating the benefits resulting from the tokenisation of both sides of the transaction.

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Tokenisation improves the efficiency of the clearing and settlement process. Clearing involves financial institutions processing payment messages, which include routing information and identification of the payer and payee, while complying with anti-money laundering (AML) and know-your-customer (KYC) requirements. Settlement then occurs, where accounts are credited or debited, and financial institutions settle with each other at central bank level.

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**Settlement assets**

There are several types of settlement asset, which may be in the exploratory or commercial phase, depending on the issuer. *Stablecoins*[16] can be issued by private companies, offering a fast and stable settlement option. *Stablecoins* can also be issued by banks, either autonomously or as part of a consortium, providing additional stability by being backed by established financial institutions. Central bank digital currencies (CBDCs) are another class of settlement asset, which can be used for retail, wholesale or interbank transactions and are backed by a central bank guarantee. In addition, tokenised deposits can be issued by banks, offering a new form of liquidity for financial transactions. Finally, units in stable value money market funds are a type of settlement asset, providing a stable and liquid solution for financial exchanges, particularly suited to transactions requiring stability of value.

- Data management benefits greatly from tokenisation. A key difference between a fund token and a fund share registered in a traditional account is that the fund token contains both data and encoded business logic, which optimises the management and analysis of financial information.

- Real-time settlement, available 24/7 or customisable, is another major advantage of tokenisation. This functionality reduces credit risk and lowers settlement, financing and operational costs, making financial transactions more efficient.

- Finally, tokenisation significantly increases the liquidity of previously illiquid assets. This results in a more efficient allocation of capital, giving investors access to a more diversified range of assets and improving the fluidity of financial markets.

### 3.3.2. Simplified record-keeping and management

Tokenisation is radically transforming the way financial records are kept and managed, thanks to the automation and transparency inherent in *blockchain* technology.

Each transaction carried out on a *blockchain* is recorded immutably in a distributed register. This immutability ensures that the data cannot be modified or deleted, which considerably increases the reliability and integrity of the information recorded. As a result, human error, which is common in traditional ledger management systems, is greatly reduced.

Another key benefit is the automation of registry management processes. *Smart contracts* make it possible to automatically schedule certain actions to take place as soon as predefined conditions are met. For example, the transfer of ownership, the payment of dividends or the redemption of bonds can be carried out automatically without manual intervention. This reduces not only the risk of error, but also the operational and administrative costs associated with managing registers.

In addition, the transparency offered by *blockchain* allows all stakeholders to view and verify transactions in real time. This transparency improves trust between market participants and

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[16] MiCA has introduced strict criteria for the use of *stablecoins* as a means of settlement, which will have a direct impact on settlement solutions for transactions involving tokenised assets.

facilitates regulatory compliance, as regulators can access transaction records clearly and transparently. Simplifying the management of records through tokenisation also facilitates better auditing. Auditors can verify transactions more quickly and accurately, improving the efficiency of audit processes and reducing associated costs.

### 3.3.3. Reducing the risk of market manipulation

The transparency and traceability inherent in *blockchain* technologies play a crucial role in reducing the risk of market manipulation.

Every transaction carried out on a *blockchain* is permanently recorded and accessible to all network participants. This transparency provides complete visibility of exchanges, making it more difficult for malicious actors to manipulate prices or conceal fraudulent transactions. Attempts at market manipulation, such as *pump and dump* or *spoofing*, become easier to detect and trace, discouraging illicit behaviour.

In addition, the traceability offered by *blockchain* means that every stage of a transaction can be tracked from origin to completion. This includes identifying the parties involved and the amount transferred, which reinforces accountability and transparency. If fraud or manipulation is suspected, transactions can be traced to identify suspicious activity and the parties involved, facilitating investigation and remedial action.

*Blockchain* also enables the implementation of smart contracts, which can automate and regulate transactions according to pre-established rules. These smart contracts automatically execute the terms of the agreement when they are completed, reducing the opportunities for human manipulation. For example, smart contracts can be used to ensure that transactions only take place when all conditions are met, preventing malicious behaviour.

Using *blockchain* for financial transactions also promotes better regulatory compliance. Regulators can access transaction records directly, making it easier to monitor and detect suspicious activity. This proactive monitoring helps maintain market integrity and protect investors from fraudulent practices.

### 3.3.4. Interoperability

Tokenisation greatly facilitates interoperability between different financial systems and market platforms. This interoperability enables existing infrastructures to be smoothly and efficiently integrated with new *blockchain* technologies, facilitating a smooth transition to more modern, interconnected financial systems.

Interoperability makes it possible to transfer securities and assets between different platforms seamlessly, without the need for complex conversion or reconciliation processes. For example, an asset tokenised on one *blockchain* can be exchanged for another tokenised asset on a

different platform, while maintaining the integrity and security of the transactions. This eliminates technological silos and allows market participants to benefit from greater flexibility and efficiency in their financial operations.

In addition, interoperability enables better coordination and collaboration between various market players, including banks, exchanges, asset managers and regulators. This increased collaboration fosters innovation and the adoption of new financial solutions, while ensuring regulatory compliance and investor protection.

The implementation of open standards and protocols that are compatible between different *blockchain* platforms also enhances interoperability. These standards allow developers to create applications and services that can work seamlessly across multiple systems, increasing the efficiency and reach of *blockchain-based* solutions.

In conclusion, tokenisation offers a number of benefits for the financial infrastructure, including instant settlement of transactions, simplified management of registries, reduced risk of market manipulation, and improved interoperability. These innovations are helping to create a more efficient, transparent and accessible financial ecosystem, enabling financial institutions and investors to take full advantage of the opportunities offered by *blockchain* technologies.

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❖ **About Adan**

*Adan federates and represents 200 professionals - new players and established companies - who are developing innovation and use cases for Web 3 in all sectors of the economy.*

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❖ **Specific contributions**

\* \* \*

# Appendix

This appendix groups together the legal definitions in the field of tokenisation.

❖ **Definitions in French law**

When it comes to *blockchain*, French law was a forerunner, adopting the first texts as early as 2016. These included Ordinance No. 2016-520 on savings bonds of 28 April 2016, Law No. 2016-1691, known as "Sapin 2", of 9 December 2016, Ordinance No. 2017-1674 on "*the use of a shared electronic recording device for the representation and transmission of financial securities*" of 8 December 2017, and Decree No. 2018-1226 on "the use of a *shared electronic recording device for the representation and transmission of financial securities*" of 8 December 2017, Decree 2018-1226 of 24 December 2018 on "*the use of a shared electronic recording device for the representation and transmission of financial securities and for the issue and sale of minibons*" (the latter no longer exist). Above all, it was the adoption of the "Pacte" Act No. 2019-486 of 22 May 2019 that established a genuine legal framework for digital asset services, reinforced by Act No. 2023-171 of 9 March 2023 known as "DDADUE 3". All of these texts bear witness to sustained legal activity over the past eight years or so.

Article L. 54-10-1 of the French Monetary and Financial Code defines digital assets as: "*1° the tokens referred to in Article L. 552-2, excluding those that fulfil the characteristics of the financial instruments referred to in Article L. 211-1 and the savings bonds referred to in Article L. 223-1; 2° any digital representation of a value which is not issued or guaranteed by a central bank or a public authority, which is not necessarily attached to a legal tender and which does not have the legal status of a currency, but which is accepted by natural or legal persons as a means of exchange and which can be transferred, stored or exchanged electronically*".

Article L. 552-2 of the CMF defines a token *as "any intangible asset representing, in digital form, one or more rights that may be issued, recorded, stored or transferred by means of a shared electronic recording device enabling the owner of the asset to be identified, directly or indirectly*".

❖ **European law definitions**

The definitions in European law are similar to those in French law, but they do not completely overlap. For example, the European regulations Régime pilote[17] and MiCA[18] , which aim to provide a framework for the development of blockchain technology and crypto-assets, introduce particularly broad definitions:

● **Distributed registry technology (or "DLT")**: a technology that enables the operation and use of distributed registries.

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[17] Regulation (EU) 2022/858 of the European Parliament and of the Council of 30 May 2022 on a pilot scheme for market infrastructures based on distributed ledger technology, and amending Regulations (EU) 600/2014 and (EU) 909/2014 and Directive 2014/65/EU.
[18] Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) 1093/2010 and (EU) 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937.

- **Distributed registry**: a repository of information that maintains a record of transactions and is shared and synchronised across a set of DLT network nodes, using a consensus mechanism.

- **Crypto-asset**: a digital representation of a value or right that can be transferred and stored electronically, using distributed ledger or similar technology.

- **Asset(s)-referenced token**: a type of crypto-asset that is not an e-money token and is intended to retain a stable value by reference to another security or right or combination thereof, including one or more official currencies.

- **Electronic money token**: a type of crypto-asset that aims to maintain a stable value by referring to the value of an official currency.

- **Official currency**: the official currency of a country issued by a central bank or other monetary authority.

- **Utility token**: a type of crypto-asset intended solely to provide access to a good or service supplied by its issuer.

- **DLT financial instrument**: a financial instrument issued, recorded, transferred and stored using distributed ledger technology.