



Tokenisation of securities in the Netherlands

Towards a clear and future-proof framework

DeNederlandscheBank

EUROSYSTEEM



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Summary

Tokenisation of securities is evolving internationally from a technical experiment to a building block of future financial market infrastructures. This development makes the question of legal compatibility more critical over time: as European and international initiatives take the step towards the regulated use of tokenisation, there is an increasing risk that Dutch market participants will turn to legal systems that more explicitly facilitate digital securities for issuance and upscaling. The conditions for implementation are therefore shifting from technological feasibility to the legal conditions under which shared infrastructures such as distributed ledger technology (DLT) infrastructures can be used for issuance, holding, delivery, pledging of tokens and also asset segregation and third-party protection in relation to tokens.

The friction in the Netherlands does not lie primarily in the qualification of tokenised securities as property rights but in the property law consequences of changes in the registration of those tokens. Although European and national frameworks do not exclude DLT, they are primarily designed for traditional market structures, administrative chains and post-trade functions. As a result, the legal compatibility between DLT registrations and the rules for the creation, holding, delivery and encumbrance of rights is not yet sufficiently explicit. Market participants therefore fall back on hybrid models with parallel traditional and DLT-based administrations, so the potential efficiency gains of tokenisation are only partially realised.

In this exploratory study, the AFM and DNB examine the EU and national legal frameworks surrounding the tokenisation of securities.

According to the Central Securities Depositories Regulation (CSDR), DLT can be used to register securities in book-entry form and to issue them directly in dematerialised form. However, under the applicable national legislation, namely the Dutch Securities Giro Transfer Act (Wet giraal effectenverkeer, Wge) and the Dutch Civil Code (BW), direct issuance in a CSD of securities that exist only in the form of tokens (direct tokenisation) is not possible. Only indirect tokenisation of securities is possible under Dutch law. Although the EU framework offers more flexibility through the DLT Pilot Regime (DLTPR), national restrictions remain decisive.

Targeted civil law adjustments are needed to make direct tokenisation of securities in the Netherlands legally tenable and scalable.

In this exploratory study, we conclude that both the BW and the Wge need to be modernised to enable the direct issuance of digital securities in a CSD. To this end, the BW and the Wge must be brought into harmony with each other and optimally aligned with the possibilities that the CSDR aims to facilitate. This route must determine the conditions under which securities can be issued only in book-entry form and can be tokenised, held, delivered and pledged directly, with guarantees of asset segregation in the chain and third-party protection.

Timely follow-up to this exploratory study is needed through a process in which concrete use cases are developed to determine the most appropriate legal route. Delay would reduce the scope for aligning Dutch efforts to European routes at an early stage and increase the risk that market practices and infrastructure choices consolidate elsewhere. These use cases can be

used to test civil, operational and supervisory assumptions and to assess whether clarification of the existing regulatory framework would suffice or whether amendments to the BW and the Wge would be desirable. At the same time, this would facilitate closer alignment with relevant European developments.



Introduction

Tokenisation is developing internationally into a strategic building block of the future financial market infrastructure. Financial instruments are increasingly being issued, held and delivered digitally. This can take place using both traditional, centralised systems of registration and shared infrastructures, such as infrastructures based on DLT. International initiatives show that direct issuance through shared infrastructures such as DLT is technically feasible and can offer concrete efficiency benefits. The international discussion about tokenisation is increasingly shifting from the question of whether the technology is applicable to the question of the legal and institutional conditions under which it can be used on a larger scale.

At the same time, the European public sector is making efforts to enable further uses of tokenisation. For example, in 2025, the central banks of the Eurosystem, including the Dutch Central Bank (DNB), launched a programme to enable financial institutions to settle transactions of tokenised financial assets in central bank money (the Pontes and Appia sections). In addition, as part of the Market Integration & Supervision Package, the European Commission is working on a revision of the European DLTPR. This revision is aimed at increasing the flexibility, proportionality and scalability of initiatives that offer DLT applications on financial markets under this regime.

Global bodies such as the World Economic Forum (WEF), the International Monetary Fund (IMF) and the International Organization of Securities Commissions (IOSCO) discuss tokenisation from different angles and mention the steady growth of tokenisation. In 2025, the WEF mainly emphasised the potential of tokenisation to make financial markets more

efficient, accessible and transparent, while pointing to barriers such as a lack of standards, limited interoperability and privacy and compliance issues. IOSCO noted in 2025 that commercial adoption was still limited, but growing, especially for bonds and money market funds. At the same time, IOSCO cites interoperability, the lack of settlement assets and legal compatibility as challenges, among others. The IMF is looking at tokenisation in 2026 mainly from the perspective of market infrastructure, monetary policy and financial stability. It notes that tokenisation is gaining momentum, but that technical standards, governance structures and legal frameworks need to converge further to combat fragmentation and enable large-scale adoption. They see a role for the public sector in this.

The proposals put forward in this exploratory study contribute to the efficiency of new and current market infrastructures. Recent developments in the international capital markets show that national legislation is an important prerequisite for the digital issuance of securities. For example, in 2021 Germany made the issuance of electronic securities possible with the introduction of the eWpG. Within this framework, Clearstream (Deutsche Börse Group) has developed digital issuance processes. A related initiative is the issuance of a digital euro commercial paper by the European Investment Bank (EIB) through Clearstream's D7 platform. Euroclear and Clearstream also recently announced services for dematerialised Eurobond issuance, which they describe as an important step in the further development of the Eurobond market. These examples show that national legal adjustments not only enable innovation but also determine where new digital issuance activities actually take place.

Further adoption and scaling of tokenisation increases the need for legal compatibility of transactions with tokenised financial instruments. As tokenisation evolves towards production environments and broader market adoption, the importance of legal compatibility for direct tokenisation of securities and of good connections of DLT infrastructures to existing financial market infrastructures increases. Existing European and national frameworks only partially provide for the desired compatibility. As a result, market participants often opt in practice for hybrid models, in which a traditional securities register or book-entry administration is combined with a token register.

This exploratory study aims to provide insight into the development and use of tokenisation of securities in the Netherlands and the legal complications involved. Against the backdrop of increasing market interest and public initiatives, the study considers how tokenisation relates to the existing Dutch and European legal framework. It uses the term financial instrument as an umbrella term within the meaning of Markets in Financial Instruments Directive II (MiFID II) and the Financial Supervision Act (Wft) but focuses on securities within that broader framework. In the case of securities, the concurrence between the CSDR, Wge, BW and DLTPR is most acute, because tokenisation directly affects issuance, holding, delivery, pledging, asset segregation and third-party protection. The term securities refers to tradable shares, bonds and similar instruments.

The study describes what tokenisation entails and analyses how the issuance, holding and delivery of securities tokens fit within the current Dutch and European legal framework.

The focus is on the legal compatibility of direct tokenisation of securities at the beginning of the securities chain. In addition, possible solutions for the identified legal bottlenecks are discussed. Such solutions will require efforts on the part of legislators, market participants and regulators. The study is based on literature research and discussions with experts and market participants.

This exploratory study is structured as follows.

Chapter 1 introduces the conceptual framework for tokenisation and describes the technological and infrastructural basis, distinguishing between direct, indirect and incomplete tokenisation. Chapter 2 places tokenisation in a European, international and Dutch perspective and draws lessons for the Dutch legal and market infrastructure context. Chapter 3 then elaborates on the Dutch legal connection and shows that existing frameworks are technology-neutral, but not completely system-neutral, and direct tokenisation of securities is currently not possible under Dutch law. Chapter 4 concludes with one central core message and then elaborates on follow-up steps in the field of route choice, legal compatibility, pilot projects and European connection. For the sake of readability, Annex 1 includes a glossary of the most important technical, legal and market infrastructure terms used in this study.

1 Tokenisation – definition and typology

This chapter introduces the conceptual framework that is used in the rest of this exploratory study. It briefly places tokenisation in the broader context of digitalisation of financial administrations, defines the concept and distinguishes three types of tokenisation that are relevant for legal analysis: direct tokenisation, indirect tokenisation and incomplete tokenisation or digital twins.

1.1 Context and definition

Tokenisation is consistent with a longer-term development in which financial administrations have become increasingly digitalised. Whereas ownership and delivery were historically determined by physical value carriers, such as share certificates, bearer securities and bills of lading, the use of digital records by intermediaries, central securities depositories and financial institutions has steadily increased. In that sense, tokenisation is not a completely separate technological break but a next step in this development. At the same time, it affects more than just technology, because shared, DLT-based infrastructures, for example, offer the opportunity to bring functions that are traditionally institutionally separate (e.g. issuance, delivery, holding and pledging) closer together within a single shared operational environment. It is precisely for this reason that tokenisation raises questions about the legal meaning of token registration and changes within it.

1.2 Typology of tokenisation

Tokenisation can be defined as the process of digitally representing and managing the rights to an asset, or the asset itself, in a shared digital infrastructure, such as a DLT system (DLTPR, Recital 3). For the legal analysis, the determining factor is not whether a token technically exists but what legal status the token represents and whether the registration is legally relevant to issuance, holding, delivery, pledging, asset segregation and third-party protection. This exploratory study distinguishes three types of tokenisation. In direct tokenisation, an asset itself is issued, held and delivered in token form. The token is therefore not just a digital representation but the only manifestation of the asset. With direct tokenisation, there is a registry or administration where the token is held. An example of direct tokenisation is a digital bond that is issued directly as a token and held exclusively in a DLT registry. There is no separate traditional form of registration in addition to the DLT register. Transfers and holdings are manifested as state changes in the registry in which the tokens are held. Such instruments are also referred to as digital-native securities.

In indirect tokenisation, the central point is that the token does not embody the asset itself but represents a contractual right to an intermediary legal structure. Indirect tokenisation involves the tokenisation of an existing asset that is already registered in a registry or administration. The token does not represent the asset itself but refers to it indirectly and can also refer to a derivative asset. An example concerns bonds that have already been issued and are then issued on a DLT. In addition to the fact that two records must be kept, the holder of

the token may be unclear about the nature and extent of the rights that the token represents. Furthermore, indirect tokenisation requires an additional legal structure to legally establish the relationship between the underlying asset and the token.

In the case of incomplete tokenisation, also referred to as digital twins, the token only acts as a digital representation or administrative tool, while the legally relevant position remains outside the DLT infrastructure. Here too, there are double administrations, as in the case of indirect tokenisation. However, there is no contractual relationship between the asset and the token, as there is in indirect tokenisation, which means that in a digital twin the token holder has no right to the underlying asset. Concrete examples of this are scarce, as the token only represents information about the asset and not the asset itself. Sometimes, digital twins are presented in the literature as the tokenisation of off-chain assets with a contractual relationship. This exploratory study adheres to the definitions used by Lavayssière, who classifies such constructions under indirect tokenisation.

1.3 Scope within the regulatory framework

Tokenisation is asset-neutral as a concept, but this exploratory study focuses primarily on securities within the broader framework of financial instruments. The study focuses on the tokenisation of securities, because it is precisely there that the civil law issues surrounding issuance, holding, delivery, pledging, asset segregation and third-party protection converge with the rules of CSDR, the Wge and DLT-based market infrastructures. As securities are part of the broader framework of financial instruments, an overview of the applicable definitions and regulatory frameworks in relation to financial instruments is a useful complement and can be found in Annex 2.

2 International context and lessons for the Netherlands

In an international perspective, several countries are actively pushing for targeted legal adjustments to facilitate tokenisation and increase compatibility with existing regulations.

The European discussion on tokenisation is increasingly showing that tokenisation is not limited to a technical experiment but touches on the competitiveness and future design of European capital markets. With the Market Integration & Supervision Package, the European Commission is taking an important step towards a more integrated and technology-neutral regulatory framework for DLT-based financial markets. The conversion of the Settlement Finality Directive (SFD) into a directly effective Settlement Finality Regulation (SFR), combined with the revision of the DLTPR, is explicitly aimed at removing structural bottlenecks that currently limit innovation and scaling.

The proposed revision of the DLTPR focuses mainly on the regulatory and post-trade framework, while important differences between national legal systems remain at the property law level. In this context, the 28th Regime is also mentioned as a possible step towards further European harmonisation. Such an optional European legal framework could offer market participants an additional route to the existing national legal systems, thereby contributing to reducing fragmentation within the internal market. For tokenised securities, this could in principle help to create a more uniform legal basis for issuance, holding, delivery, pledging, asset segregation and third-party protection, and thus reduce national frictions around direct

tokenisation. At the same time, a 28th Regime is not an obvious solution. The national property law rules on tokenisation differ considerably between Member States. Only when the European regime is designed sufficiently autonomously, completely and clearly will it be able effectively to reduce national incompatibilities. Otherwise, there is a risk of creating an extra legal layer in addition to existing national frameworks. For the Netherlands, this means that European harmonisation is relevant in the longer term but that the question of the alignment of the Dutch legal framework remains as topical as ever.

The comparison with Luxembourg, France, Germany and the United Kingdom shows that legal certainty and compatibility can be built up in different ways (see Annex 3). Luxembourg and France mainly opt for recognition of DLT-based registry operation within securities law, with the digital registration able to function as a legally relevant registration under certain conditions. Germany has created a specific regime for electronic securities, with regulated registrars and room for DLT-based registries. The United Kingdom is taking a different route by recognising digital assets as possible objects of personal property rights under civil law and also providing regulatory scope for experimentation through the Digital Securities Sandbox. The common lesson is that tokenisation does not automatically scale up through technological neutrality alone: market participants need clarity about registry operation, ownership status, allocation of responsibility and the relationship with existing securities and infrastructure rules.

Pilots by the Eurosystem and the Bank for International Settlements (BIS) confirm that tokenisation is increasingly being approached as an infrastructure issue. The Eurosystem is exploring how transactions in tokenised financial assets can be settled in central bank money and how such solutions can connect to existing and future wholesale market infrastructures through trajectories such as Pontes and Appia. Initiatives such as Project Agorá and previous DLT bond and settlement pilots also show that tokenisation has potential value for the convergence of payment and securities flows, liquidity savings and cross-border settlement. At the same time, these pilots make clear that technical feasibility in itself is insufficient: for the transition to production, technical finality, governance, operational controllability and connection to public money and existing infrastructures are decisive conditions.

For the Netherlands, it follows that the core task does not lie in the creation of a completely new, legal framework but in targeted, explicit legal compatibility within the existing property law and post-trade frameworks. International examples show that scaling up mainly requires an explicit choice of which registration is legally decisive, who is responsible for it and what protection rights holders enjoy. In addition, a structured elaboration of concrete use cases under Dutch law can help to test operational requirements and legal assumptions in practice. Without a clear legal anchor, they are likely to remain dependent on hybrid models and contractual workarounds. The further analysis therefore focuses on the question of where Dutch law, more specifically the Wge and the BW, needs clarification or modernisation to make direct tokenisation of securities legally tenable, feasible and scalable.

3 Towards a future-proof legal framework for tokenisation of securities

EU and national legal frameworks are in principle formulated in a technology-neutral way but implicitly assume a traditional design of the financial market infrastructure. For example, many obligations within the European regulatory framework are based on a structure with trading venues, central counterparties, central securities depositories (CSDs) and a chain of intermediaries. Dutch legislation, in particular the BW and the Wge, also presupposes a standard chain of intermediaries and specific ways in which securities are legally created and transferred, either by means of notarial deeds or by means of legally prescribed acts of delivery. While relevant frameworks such as MiFID II/MiFIR, CSDR and the Wge do not preclude the use of DLT, there is no explicit legal basis that allows for direct tokenisation. This causes friction in the event of a desire to issue, hold and deliver securities directly on a DLT network.

3.1 Tokenisation of securities

For securities admitted to trading on, or traded through, a trading venue, the European post-trade framework establishes a clear link between multilateral trading and CSD-based settlement. The CSDR provides that an issuer established in the Union must have such securities represented in book-entry form, either by immobilisation or following a direct issue in dematerialised form (Regulation (EU) No 909/2014, Art. 3(1)). In addition, transactions in such securities that take place on a trading venue must be registered with a CSD in book-entry form by the intended settlement date (Art. 3(2)). This means that tokenisation of securities admitted to trading on, or traded through, a trading platform cannot in practice be seen separately from the

CSDR. For securities that are not intended for trading purposes (including secondary trading), registration with a CSD is also possible. Custody with a CSD may be of interest because of additional services (asset servicing/processing corporate actions, safekeeping). However, this does not have to take place through a CSD, unlike in the case of multilateral trading, where the CSD route is required by law. When it comes to the tokenisation of such securities, the CSDR is technology-neutral. A DLT could therefore be used for the book-entry recording of securities. In the case of immobilisation, where direct issuance is not possible, this takes the form of indirect tokenisation. In the case of direct issuance in dematerialised form, this is referred to as direct tokenisation. However, the above-mentioned outcomes of EU law cannot be seen in isolation from the relevant national legislation.

3.2 BW and Wge

Within the Dutch legal order, the Wge determines to a large extent how tokenisation of securities can be legally incorporated.

In principle, the Wge works with a tiered system of giro deposits at the central institution (Euroclear Nederland) and collective deposits at intermediaries, whereby investors acquire no individual right to specific securities but hold a share in the community of the relevant deposit. This system explicitly links delivery, asset segregation and third-party protection to entries within the chain. It also offers protection against intermediary risks and builds on the provisions of the BW. For securities that are required to exist in book-entry form within a CSD on the basis of the CSDR, it is therefore logical to have tokenisation legally aligned with this existing Wge chain, which

is in principle possible with a DLT register such as Wge administration. Although the CSDR offers the possibility for securities to be issued directly in dematerialised form, a direct issue by crediting to the CSD is not provided for in the Wge, which requires a delivery of pre-existing shares for inclusion in the giro deposit. Amending the Wge and relevant parts of the BW to include securities directly in dematerialised form and to better align with the possibilities of the CSDR in this respect was considered in amendments to national financial market legislation in 2016.¹ However, this change was not implemented at the time, partly because of a lack of clarity about the added value of securities in dematerialised form. In practice, this means that direct tokenisation of securities is currently not possible under Dutch law.

Indirect tokenisation of securities under the Wge is theoretically possible using a DLT as a giro or collective deposit administration. From a property law perspective, this requires two steps. First, the securities must be validly created under civil law and then delivered to a CSD or intermediary. Second, in accordance with the Wge, the securities must be included in a collective deposit or giro deposit by entry in the appropriate administration. In the event of a subsequent transfer, the transfer of securities in the books of the CSD or intermediary will take place under the Wge. A similar system applies to indirect tokenisation of securities through a collective deposit with an intermediary. In short, a security can be tokenised indirectly after it has been delivered to a giro or collective deposit, where a DLT is used for the deposit administration. This means that indirect tokenisation of securities is

not categorically excluded under Dutch law but that certain efficiency gains of DLT remain limited as long as the legally relevant issuance, holding and delivery continue to rely on their separate creation before they can be included in a deposit.

The acts of delivery required by the BW remain an independent focal point. For the transfer of property rights, Article 3:84 BW requires a valid title, power of disposal and delivery, with specific acts of transfer being prescribed for each type of right. For rights of claim and debt instruments that are designed as registered claims under civil law, assignment by means of a deed intended for that purpose and notification to the debtor may be required (Article 3:94 of the BW). In the case of registered shares in an NV or BV, outside a book-entry structure, issue and transfer take place in principle by notarial deed, in addition to the independent company law requirements of Book 2 of the BW. For bearer claim rights, transfer takes place by physical transfer of the document representing the right. An on-chain state change in a DLT register does not necessarily fit in with these existing forms of delivery. Although the BW can be read in a technology-neutral way, it is not necessarily system-neutral: it assumes traditional acts of delivery that do not automatically coincide with the characteristics of tokenisation and DLT. For example, although the notification to the debtor does not have to follow a prescribed form, the legislator has not explicitly stated that a DLT state change (with notification) qualifies as such a notification. Contractual provisions or smart contracts may support this but do not automatically remove the uncertainty under property law.

¹ [Parliamentary Paper 34198, no. 3 | Overheid.nl > Official Announcements.](#)

As long as Dutch law does not explicitly stipulate the conditions under which changes in a DLT registration have property law consequences, parties will continue to have to rely on indirect tokenisation, incomplete tokenisation and the resulting hybrid models for tokenisation. Existing acts of delivery are used for this, for example by means of an electronic deed, digital delivery instruction or contractual link to an off-chain administration. Both CSDs and intermediaries could use the Wge for indirect tokenisation of existing securities, but direct tokenisation of securities remains impossible without changes to both the BW and the Wge.

3.3 DLTPR

The DLTPR provides regulatory scope for experimentation for DLT-based market infrastructures but does not create a national property law framework. Within the DLTPR, market infrastructures may, subject to conditions, use DLT for trading and/or settlement of DLT financial instruments and obtain specific exemptions from elements of MiFID II/MiFIR and CSDR. This allows for testing within a controlled environment to ascertain how trading, registration and settlement functions can be brought closer together and how DLT can be used. While it provides a degree of flexibility at EU legal level, the DLTPR does not change national rules on issuance, holding, delivery, pledging and asset segregation. Even within the Pilot Regime, the BW and the Wge continue to determine the property law status of the registration and the position of entitled parties. The issuance of DLT instruments under Dutch law is therefore limited to an indirect tokenisation form, with Dutch DLT market

infrastructures for direct issuance being required to use the national legal system of other Member States through the CSDR passporting scheme.

3.4 Possible solutions

The above analysis shows that, while some forms of tokenisation of securities are possible in the Netherlands, legal modernisation is needed to further increase the possibilities for tokenisation of securities in the Netherlands.

Legal modernisation is necessary not only to eliminate the current incompatibility but also to prevent tokenisation in the Netherlands from being structurally limited to indirect and hybrid models. Without a workable legal anchor, there is a risk that the Dutch market will lose competitiveness and that even where DLT is used (including partially), its potential cannot be fully exploited. Several solutions are possible in this regard. First, consideration could be given to a targeted clarification or modernisation of the BW and the Wge with regard to direct tokenisation. The Electronic Bill of Lading Introduction Act² illustrates that the BW can already accommodate targeted adaptations to new forms of digital registration. Although this development concerns the shipping sector, it shows that existing civil law frameworks can be adapted to such forms of digital record-keeping. Second, a harmonising solution at EU level, such as the 28th Regime, could be supported. In the short term, targeted BW and Wge amendments could precede EU harmonisation efforts in the longer term. In addition, further exploration and cooperation between regulators and the government could both improve the market environment and form the basis for a long-term, evidence-based approach.

² [Electronic Bill of Lading Introduction Act](#) (Parliamentary Papers 36 743). See in particular the explanatory memorandum.

4 Key message and recommendation

The key message of this exploratory study is that Dutch law lacks a general explicit regulation determining the conditions under which direct tokenisation of securities is possible. European and Dutch frameworks do not exclude DLT but often attach legal consequences to traditional market structures and systems. Although the CSDR offers room for tokenisation, the Wge and the provisions of the BW limit the possibilities for tokenisation of securities under Dutch law.

A timely joint follow-up process by the Ministry of Finance, the Ministry of Justice and Security, DNB, the AFM and market participants is needed to substantiate the findings of this study before European frameworks and market practices crystallise further. Within such a process, one or more clearly defined use cases can be selected and elaborated. This can provide insight into the most appropriate legal route and the extent to which clarification of existing regulations, for example in the form of guidance, would be sufficient or whether the BW and the Wge should be amended. At the same time, it is important to align with relevant European developments, including the revision of the DLTPR, the 28th Regime, the CSDR and central bank money settlement initiatives, so that national choices remain consistent with future European frameworks.

Annex 1 Glossary

Holding: Holding is understood to mean the retention of the right to a good, right or position, while maintaining the rights, interests and risks associated with it.

Dutch Civil Code (BW): The Dutch legal framework for property relationships. In the case of tokenisation, the Dutch Civil Code is particularly relevant to the issuance of securities and the delivery of property rights to which the Wge does not apply.

Central Securities Depositories Regulation (CSDR): European regulation that provides rules for the settlement and custody of securities and the operation of central securities depositories (CSDs). The CSDR prescribes that securities admitted to trading must be held in book-entry form with a CSD, but in principle it leaves open the choice of technology for the underlying administration.

Digital twins: Term for incomplete tokenisation, where a token acts solely as a digital representation or administrative tool, while the legal acts for delivery remain outside the DLT infrastructure.

Direct tokenisation: Tokenisation model in which the financial instrument or other property right itself exists and is issued exclusively in digital token form.

DLT-based securities registration: Registration of securities using a DLT infrastructure. Depending on the legal structure, such registration may have a purely administrative function or form part of a legally relevant administration for issuance, holding and delivery.

DLT Pilot Regime (DLTPR): European pilot regime that provides room for experimentation under certain conditions for market infrastructures that facilitate trading and/or settlement of DLT-based financial instruments. The regime provides for limited exemptions from parts of MiFID II/ MiFIR and CSDR but does not create a civil law framework.

Securities: Securities within the meaning of Section 1:1 of the Financial Supervision Act (Wft) and Article 4(1)(44) of MiFID II, including shares and equivalent negotiable security instruments, bonds and other negotiable debt instruments, as well as other negotiable securities that give the right to acquire or sell such securities or that are settled in cash. In this exploratory study, securities form the central analysis category, because it is precisely there that the confluence between civil law, CSDR, the Wge and DLT-based market infrastructures comes to the fore.

Financial instrument: An instrument as referred to in Section 1:1 of the Financial Supervision Act (Wft), i.e. the instruments referred to in Annex I, Section C, of Directive 2014/65/EU (MiFID II). In short, this includes:

1. Securities, including stocks and bonds;
2. Money market instruments;
3. Units of collective investment undertakings;
4. Derivative financial instruments (derivatives), including:
 - derivatives on securities, currencies, interest rates, commodities, allowances, indices or other measures;
 - contracts for difference;
 - other derivatives that are physically or cash-settled;
5. Emission allowances.

Hybrid models: Tokenisation models in which digital (on-chain) administration is combined with traditional (off-chain) administration. In practice, these models are often used as a workaround in the event of legal incompatibility regarding the recognition of DLT registration for issuance, holding and delivery.

Indirect tokenisation: Tokenisation model in which the token does not embody the financial instrument or other property right itself but represents a derivative legal or contractual position in relation to an underlying financial instrument or property right. This can also be a financial instrument, but this study does not cover such cases.

Incomplete tokenisation: Tokenisation model in which the token acts solely as a digital representation or administrative tool of a financial instrument or other property right that persists outside the DLT infrastructure. Incomplete tokenisation is also referred to as digital twins.

Not system-neutral: Feature of regulation which, despite technological openness, implicitly assumes certain market structures, functions and intermediary roles, such as those of CSDs and intermediaries, as a result of which alternative system arrangements do not necessarily fit within the existing legal framework.

Transfer: The legal transfer of a financial instrument or other property right from the assets of one rights holder to those of another. In the context of tokenisation, the supply required for that transfer can in certain cases be achieved by means of a registration, accounting or state change within a DLT administration, or a hybrid

model. Whether such a registration or state change actually constitutes an act of delivery depends on the applicable civil law and sectoral framework: the Dutch Civil Code and the Wge.

Register (administration): An electronic medium in which the issuance, holding and delivery of financial instruments or other property rights are recorded, regardless of whether that register (administration) is constitutive to this purpose. In this study, the terms administration and register are used interchangeably.

Smart contract: An automated computer code within a DLT or blockchain infrastructure that automatically executes predefined instructions when certain conditions are met.

Technology-neutral: Characteristic of regulations where the use of a specific technology, such as DLT, is not in principle required but is not excluded.

Tokenisation: The process of digitally representing and managing the rights to an asset, or the asset itself, in a shared digital infrastructure, such as a DLT system.

Issuance: The legal and administrative establishment of a financial instrument or other property right within a legally relevant administration or register structure, in such a way that it first arises and can subsequently be granted to a rights holder. In the context of tokenisation, issuance refers to the administrative and, if legally recognised, property-relevant creation and registration of a position within a DLT register, or a hybrid model. Whether such registration has constitutive property law effect depends on the applicable civil law framework.

Securities Giro Transfer Act (Wge): Dutch legal framework for holding and transferring securities in book-entry administrations with a central institution and intermediaries. The Wge regulates the property rights of securities owners, the delivery and pledging of securities within the meaning of the Wge and third-party protection.

Annex 2 Legal demarcation of financial instruments and securities

MiFID II	Wft	CSDR	Wge
Financial Instrument			
Art. 4(1)(15): Financial instrument: means those instruments specified in Section C of Annex I, including such instruments issued by means of distributed ledger technology; Section C, Annex I: (1) Transferable securities; (2) Money-market instruments; (3) Units in collective investment undertakings; (4) – (10) Various types of derivative contracts; (11) Emission allowances.	Art. 1:1: Financial instrument: means an instrument listed below, including such instruments issued by means of distributed ledger technology: a. Security; b. Money market instrument; c. Right of participation in an investment undertaking or UCITS, other than a security; d. – j. Various derivatives; k. Emission allowances.	Art. 2(1)(8): 'Financial instruments' or 'securities' means financial instruments as defined in point (15) of Article 4(1) of Directive 2014/65/EU.	Art. 1: Security: financial instrument as referred to in part a, b or c of the definition of financial instrument in Section 1:1 of the Financial Supervision Act and another financial instrument in respect of which a central institution has determined that it may belong to a giro deposit.
Securities			
Art. 4(1)(44): Transferable securities: means those classes of securities which are negotiable on the capital market, with the exception of instruments of payment, such as: (a) shares in companies and other securities equivalent to shares in companies, partnerships or other entities, and depositary receipts in respect of shares; (b) bonds or other forms of securitised debt, including depositary receipts in respect of such securities; (c) any other securities giving the right to acquire or sell any such transferable securities or giving rise to a cash settlement determined by reference to transferable securities, currencies, interest rates or yields, commodities or other indices or measures.	Art. 1:1: Security: (a) A negotiable share or another negotiable security or right that can be assimilated to it, other than an apartment right; (b) A negotiable bond or other negotiable debt instrument; or (c) Any other negotiable security issued by a legal person, company or institution with which a security referred to in subsection a or b can be acquired by exercising the rights attached to it or by conversion or which is settled in cash.	Art. 2(1)(35): Transferable securities: means transferable securities as defined in point (44) of Article 4(1) of Directive 2014/65/EU.	Art. 1: Security: financial instrument as referred to in part a, b or c of the definition of financial instrument in Section 1:1 of the Financial Supervision Act and another financial instrument in respect of which a central institution has determined that it may belong to a giro deposit.

Annex 3 International comparative law

Luxembourg. Luxembourg has facilitated the tokenisation of securities incrementally through successive blockchain laws. This legislation recognises the use of DLT for the issuance, registration and transfer of dematerialised financial instruments and extends the recognition to, inter alia, financial collateral and certain instruments. An important element is the introduction of functional roles, such as the control agent, which ensure consistency between issuance and registration. The Luxembourg model illustrates how legal certainty can be increased by giving DLT registers an explicit legal place within existing securities law.

France. France has introduced a legally recognised shared electronic register for certain *titres financiers* with the concept of the *dispositif d'enregistrement électronique partagé* (DEEP). A registration in a DEEP can, under certain conditions, have the same legal significance as a traditional account registration. The French rules also impose minimum requirements for integrity of registrations, identification of holders, continuity and access to transaction statements. The French approach is therefore especially relevant as an example of functional equivalence between classic securities administration and DLT-based registration.

Germany. Germany has created a specific legal framework for electronic securities with the *Gesetz über elektronische Wertpapiere* (eWpG). This regime allows for issuance without physical paper and allows registration in a central electronic

securities repository or in a DLT-based *Kryptowert* paper registry. The registry function is linked to a designated or qualified registrant, so that responsibility and visibility remain central. The German model shows that direct issuance and transfer of digital securities can be made legally possible, but also that the operation of such a regime is embedded in national law.

United Kingdom. The United Kingdom has mainly focused on civil law recognition of digital assets as possible objects of personal property rights. This approach does not create a specific securities registry regime for DLT securities but clarifies that digital or electronic objects are not excluded from property protection just because they do not fit into traditional common law categories. In addition, the Digital Securities Sandbox provides an experimental regulatory framework for digital securities infrastructures. The UK approach thus combines broad civil law clarification with controlled market infrastructure pilots.

Comparative interpretation. The four approaches differ in technique but point in the same direction: tokenisation requires more than general technology neutrality. Legal compatibility should cover the status of the registration, the responsible registry function, the protection of rights holders and the connection to existing securities and market infrastructure rules. In the case of the Netherlands, it is particularly pertinent that a choice be made about explicitness within the Wge chain and recognition of DLT registration within the Dutch Civil Code.

Country	Legal Route	Recognition of DLT	Register and Responsibility
Luxembourg	Subsequent blockchain laws within the existing securities law framework	DLT explicitly permitted for issuance, registration and transfer	Functional roles, including a control agent, oversee consistency
France	DEEP legally recognised as a shared electronic recording system	Registration in DEEP may be equivalent to traditional account-based registration	Minimum requirements for integrity, identification, continuity and access
Germany	Specific statutory framework through the eWpG	Electronic securities without a physical certificate; central or DLT-based register	Designated or qualified registrar remains responsible
United Kingdom	Legal recognition under private law, supplemented by the Digital Securities Sandbox	Digital assets may be the object of proprietary rights	No specific DLT securities register; experimentation within the sandbox framework

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