

Scaling DLT Capital Markets

Enabling Central Bank Money Settlement and Collateral Eligibility for DLT-based Securities

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Executive Summary

The ECB trials and experiments have shown the importance of central-bank money settlement to the development of European DLT-based capital markets. According to AFME data, the ECB trials and experiments were linked to >EUR 1 billion worth of DLT-based bond issuance in 2024, ca. 1/3 of the total such issuance worldwide.

It is crucial that the ECB continue to build on this momentum in a way that enables Europe to remain in the lead when it comes to the scaling and maturing of DLT-based markets, especially at a moment where jurisdictions worldwide are taking steps to develop theirs. Building DLT-based markets can also play a crucial role in achieving key EU policy objectives in the area of competitiveness, Capital Markets Union and enhancing efficiency in and ensuring robustness of capital markets.

Two key building blocks towards at-scale DLT-based markets that fall within the ECB's remit include:

- 1. Availability of a well-designed solution for settlement in central bank money of DLT-based transactions; and
- 2. Eligibility of DLT-based assets to serve as collateral in Eurosystem credit operations.

More specifically, AFME recommends the following actions by the ECB and Eurosystem with respect to these two building blocks:

Areas	Recommendations to the ECB/Eurosystem
1. Central Bank Money	 Develop an operational interoperability solution in the shortest feasible timeframe (operational within a year). Ensure the solution enables smooth and swift implementation by industry, by ensuring that it links seamlessly to exiting settlement infrastructure (Target 2). Ensure the solution enables efficient liquidity management, by avoiding risk of fragmentation and settlement finality uncertainty. Consider how to maximise the solution's value and take-up by enabling it to be used across a variety of use cases and for it to offer settlement that is as close as possible to atomic settlement.
2. Collateral eligibility of DLT- based securities	 Consider how credit, market and liquidity risks the ECB's General Framework for collateral aims to mitigate can be addressed for DLT-based securities through existing regulatory, operational and contractual requirements. In particular, mitigation of these risks in a DLT environment could be achieved through: Assessing the operational robustness for non-CSD platforms by application of existing relevant regulations (e.g. CRD, DORA) Assessing underlying indicators of liquidity of DLT-based securities instead of admission to trading requirement, e.g. number of quotes for a DLT-based security.

Introduction

Europe has played a leading role in the development of DLT-based Capital Markets worldwide. Last year, European DLT-based markets showed a remarkable upward trajectory, with issuance of DLT-based fixed-income instruments more than tripling, totaling over €3 billion (figure 1).¹

The ECB trials and experiments served as a key catalyst in this development (figure 2) - attracting over 60 market participants and €1.6 billion in funds settled- by providing the ability to directly settle DLT-based transactions in central bank money. This has long been considered a breakthrough step in the development of DLT-based markets, enabling DLT-based transactions' cash legs to benefit from risk-free settlement assets.

With the success of the trials and experiments, the focus has shifted towards how the scaling of **DLT-based markets can be continued** and what role central banks – and in particular the European Central Bank (ECB) – can and should play in this process. AFME welcomes the ECB's announcement that it plans to implement a platform that can support an interoperability solution in the shortest feasible timeframe. Operationalising central-bank-money settlement for DLT-based transactions and including DLT-based assets in central-bank collateral frameworks would be key next steps in enabling scaling of DLT-based markets and ensuring technology neutrality. This paper discusses the steps to be taken in these two areas in the short term.





Rest ECB trials SNB trials



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¹ See AFME's DLT-based Capital Market Report for further data on market developments.

1. DLT-Linked Central Bank Money

1.1 Importance of DLT-Linked Central Bank Money

Unique benefits of DLT-linked central-bank money settlement

DLT-linked central-bank money settlement offers unique benefits compared to alternative settlement cash assets available in DLT-based capital markets. In particular, DLT-linked central bank money offers advantages in relation to counterparty credit and settlement risk when compared to alternative assets:

First, in the absence of operationalised DLT-linked central bank money, alternative, privately-issued settlement assets have been deployed in recent years. These have included commercial bank money, stablecoins (on-chain) and synthetic wholesale CBDC (tokens backed by central-bank money held in traditional RTGS systems). While these assets are expected to continue to play a significant role in DLT-based markets for the foreseeable future, it is widely considered that publicly issued and controlled central bank money offers unique advantages over these alternatives for wholesale markets, particularly in relation to counterparty credit risk. Central bank money directly issued by central banks offers a direct claim on central banks, thus eliminating counterparty credit risk associated with settlement assets that either represent claims on private issuers (e.g. banks, stablecoin issuers) or involve reliance on private intermediaries for settlement.

In addition to on-chain assets, off-chain settlement assets have also been deployed to settle DLT-based capital market transactions. Off-chain assets include commercial and central bank money represented in traditional payment infrastructures (i.e. not connected distributed ledgers). The use of such assets, however, requires additional (manual) coordination of the (on-chain) asset leg and the (off-chain) cash leg of a transaction and as such reduces or eliminates one of the key benefits offered by DLT: the ability for atomic settlement - i.e. either all legs of a transaction settle or none of them do – that reduces settlement risk.

Given these benefits, the ability to settle in DLT-linked central bank money represents a prerequisite both to the scaling of DLT-based capital markets and to ensuring financial stability in DLT-based capital markets as they develop.

This has been underscored by the ECB trials and experiments: AFME members have indicated that the trials and experiments significantly enhanced and actualised client and market interest in DLT-based issuance and other types of transactions.

Supporting Key Policy Objectives

In light of the importance of DLT-linked central bank money solutions for the development of DTL-based markets, it can be stated that operationalisation of such solutions can play a key role in achieving policy objectives as set out by both the European Commission and the ECB:

Financial Stability:

Maintaining financial stability will remain a key policy objective as DLT-based capital markets develop. The ability to settle in central-bank money is key to achieving this objective, by mitigating counterparty credit risk of transaction cash legs.

Capital Markets Union:

CMU is a key priority for the EU, and the ECB has indicated that DLT can and should play a key role in the CMU discussions and development. While this bold vision is very welcome, it is hard to see how it can be achieved without further steps in the development of central-bank money settlement on DLT, central bank money being a cornerstone of robust capital markets.

International Competitiveness:

DLT represents a technology in which the EU has played a leading role, particularly in its application in capital markets. The ability to settle in DLT-linked central bank money is a key component of scaling of such markets. Moreover, other central banks are moving forward with the development of central-bank money solutions: the UK has enabled the deployment of synthetic CBDCs, the US has trialed the use of

DLT-linked central bank money as part of the RSN project, and the Swiss National Bank has recently extended its pilot DLT-linked central bank money.

Guiding principles for DLT-linked central bank money

Considering the relevance and benefits of DLT-linked central bank money as set out in the previous section, it must be noted that such benefits are not binary and depend on the details of the design of DLT-linked central bank money.

Therefore, in moving forward towards DLT-linked central bank money, a number of key guiding principles should be applied:

Preservation of the two-tier monetary systems

The two-tier monetary system is the cornerstone of the financial system and creates a clear division of roles between public and private entities: central banks. While DLT could give rise to infrastructures that differ from those in traditional capital markets, there is no a-priori reason to presume that this would or should give rise to changes in access to various settlement assets, in particular to central bank money. Indeed, it is in the interest of maintaining financial stability to ensure that access to central-bank money remains limited to select and well-regulated financial entities.

Promotion of competition and innovation in FMI

DLT characteristics enable distributed but connected settlement infrastructure, as well as robust market infrastructures. The fast pace of innovation in DLT requires a strong role for private-sector entities in the ongoing design of DLT-linked central bank money and DLT-based settlement infrastructures.

Two-step approach to development of DLT-linked central bank money

A significant degree of uncertainty exists with respect to the development and the ultimate makeup of DLTbased markets. While currently different platforms and ledgers are deployed, the beginnings of a movement towards linkage and collaboration can be observed. Therefore, it is likely that short-term centralbank money solutions may not be optimal in the longer run, requiring a two-step approach to enabling central-bank money settlement for DLT-based transactions.

Policymakers have expressed some concerns regarding such a multistep strategy. In particular, it has been argued that it would give rise to lock-in risk: short-term solutions would become engrained due to the significance of switching costs. Lock-in risk should, however, not be overstated; and analogies with data standard implementations have limited applicability: the value of standards lies in their network effects and indeed in their singularity, i.e. a standard only has value if all (market) parties adhere to it. While network effects apply to market infrastructures, they play less of a role for money instruments as such.

Therefore, avoiding lock-in risk can be considered as one of the criteria in designing solutions in the short term, for instance by opting DLT-linked central bank money solutions that would not require participants to participate in a specified market infrastructure (e.g. a single or unified ledger), as well as by considering upfront investment required to deploy a particular solution.

1.2 Short-term DLT-linked central-bank money solution

Key elements for consideration

For the purpose of the ECB trials and experiments, 3 different solutions were made available by National Central Banks. In designing its short-term solution, the ECB should consider a number of important elements. These elements are summarised in the figure below and further elaborated on in this section:



Implementability

A vital element to consider is the ability for both central banks and market participants to implement the solution in the short term. Given developments around the world and the market interest signaled as part of the ECB trials and experiments, implementing a solution in the shortest feasible timeframe must be a key objective.

To this end, implementability should be at the core of the design decisions. Particular aspects to consider include:

- *Ease of onboarding:* how easily and quickly could market participants onboard to the solution.
- *Technological neutrality*: the compatibility of the solution with a wide range of technological solutions.
- Need for legal clarification: as indicated earlier, introducing new forms of central-bank money may require legal clarity, whereas solutions based on existing infrastructure would be likely to require limited to no legal clarifications.

Use cases

To ensure uptake and value-add from an interoperability solution, the design of such a solution should enable a range of use cases, particularly with respect to DvP settlement and cross-border payments.

In order to maxmise the benefits from such use cases, consideration can also be given to making adjustments over time to existing settlement infrastructure to support DLT-based features. For example, the ability to conduct on-chain intra-day repo transactions is a key DLT-based use case in capital marrkets. Over time, a gradual extension of Target2 opening hours would enable the benefits of such intra-day repos to be further maximised, enabling central-bank money settlement across a wider time window.

Atomicity

A key benefit provided by DLT is automated (without intermediaries) and more instantaous DvP settlement; settlement in which either all or none of the legs of a transaction are settled ('atomic settlement').

While interoperability solutions in the short term will not enable cash and assets to reside and settle on the same ledger – and hence not enable full atomic settlement - in designing an interoperability solution, it is important for the ECB to consider the degree of atomiciy that can be achieved and the mechanisms deployed to achieve this.

In particular this would require:

- DLT-based coordination of transaction legs.
- No extension of timeout period compared to default timeout management used in trials and experiments. No distribution of cancellation keys to stakeholders.
- Moreover, compared to the trials and experiments, greater technological maturity of the interconnectivity solution is required to reduce the probability of non-atomic settlement in which one transaction leg settles while the other does not.

 In addition, legal certainty is required regarding the settlement status of a transaction in which only one leg has settled. It is thus recommended the ECB launch a consultation with legal experts from platform operators and market participants focused on rights and obligations of participants in DLT platforms, as well as contingency measures related to technical failures. Such a consultation can also relate to transparency about what settlement finality model is applied on the platform.

Liquidity management

A third key element for consideration involves the ability to manage liquidity effectively under an interoperability solution. In this respect, two elements must be taken into account in particular:

- Avoidance of liquidity fragmentation by eliminating pre-funding needs: the need to prefund transactions settled through the interoperability solution e.g. through the requirement to prefund a TIPS account or to tokenise DCA funds on an ex-ante basis) would result in a fragmentation in the holdings of central-bank money, which would enhance operational cost and risk and reduce efficiency.
- Legal clarity on the treatment of central-bank money: particularly if an interoperability solution were to make use of a new form of central-bank money e.g. tokens clarifications that such tokens would constitute central-bank money would be required.

Overall assessment

The AFME membership sees value in (elements of) all 3 solutions deployed in the trials and experiments. AFME does not endorse a particular solution or combination of solutions.

However, we do reiterate the need for a solution that can be accessed and utilised in the shortest feasible timeframe. With this in mind, solutions that link to existing infrastructure – in particular the Target2 infrastructure – would enable swifter and more straightforward industry take-up, both from an operational and legal perspective.

2. Collateral Eligibility for DLT-Based Assets

Central banks, including the ECB, provide credit to eligible financial institutions against (adequate) collateral. What securities are eligible as collateral is regulated by the Eurosystem legal framework for monetary policy instruments, consisting of the ECB's General Framework and the Temporary Framework. Currently, certain DLT-based securities are not being accepted by the ECB as eligible collateral. This section sets out proposals to address this.

2.1 Background: overview of collateral eligibility and its significance

Central banks provide credit to eligible financial institutions in exchange for posting of eligible collateral. The Eurosystem legal framework sets eligibility requirements for collateral, including, broadly:

- Marketable assets, meaning debt instruments admitted to trading on a market that fulfil certain eligibility criteria, and
- Non-marketable assets, meaning fixed-term deposits, credit claims, retail mortgage-backed debt instruments and non-marketable debt instruments backed by eligible credit claims, again subject to the relevant assets fulfilling certain additional eligibility criteria.

As DLT-based markets scale, it is key to review and update the Eurosystem's collateral eligibility criteria to ensure financial stability and smooth functioning of financial markets. This is of particular relevance given the important role eligible securities play in capital markets and the likely growth of importance of DLT-based securities over the next years.

Moreover, whether DLT-based securities are eligible as collateral will also affect the development of DLTbased markets: the ability to pledge a particular security as collateral enhances the utility and liquidity of the security, which is of great relevance to investors and thus, in turn, to the liquidity of the security. It is therefore important to develop a step-by-step approach of reviewing and enabling DLT-based in order to further develop, providing clarity on collateral treatment and eligibility of DLT-based securities.

2.2 Current treatment of DLT-based securities

DLT-based securities issued through the DLT Pilot Regime can – under existing regulation and collateral criteria - be admitted to trading and thereby be eligible as marketable-asset collateral.

Notably, such treatment would be in line with developments in other jurisdictions. In particular, the Swiss National Bank accepts securities issued using its pilot for wCBDCs as eligible collateral, and the Bank of England accepts securities issued through the UK Digital Securities Sandbox (DSS) as eligible collateral for credit operations.

However, currently, a significant percentage of DLT-based securities are issued outside the DLT Pilot Regime framework, and the Eurosystem legal framework does not currently enable DLT-based securities issued outside the DLT Pilot Regime to be pledged as collateral. This is because:

- (1) <u>The Eurosystem currently requires that securities in order to be eligible as marketable-assets collateral be recorded in book-entry form in an eligible Securities Settlement System (SSS).</u> To be considered as eligible, an SSS has to meet the following 2 categories of criteria²: (i) The SSS is a National Central Bank or CSD located in the Euro Area; and (ii) the SSS meets additional criteria, including related to legal certainty and bankruptcy remoteness, SSS opening hours, the SSS's ability to settle DvP and FoP on an intraday basis, and links to other SSSs. In add DLT-based securities issued outside the DLT Pilot Regime will not usually satisfy these requirements.
- (2) <u>The Eurosystem requires eligible marketable-assets collateral to be admitted to trading on a regulated market or an accepted non-regulated market</u>. Since recording of a security in book-entry form in a CSD is a prerequisite for admission to trading, this requirement can generally not be met by DLT-based securities
- (3) <u>DLT-based securities would not fall within any of the current sub-categories of non-marketable-assets</u> <u>collateral.</u>

² See Annex VI A https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02014O0060-20210101&gid=1611906501434

2.3 Proposals

In light of the potential offered by DLT, it is important to consider how DLT-based assets can be brought into the Eurosystem's collateral framework:

Overarching aims of the eligibility framework

Given that the Eurosystem's collateral eligibility framework was not designed with DLT in mind, the framework should be updated in light of its general objectives and how provision of DLT-based securities as collateral could achieve these objectives.

As set out by the ECB,³ the Eurosystem's collateral framework is aimed at translating the statutory requirement of adequate collateralisation into concrete tools and procedures that guarantee sufficient mitigation of the financial risks. For these purposes, mitigation of three kinds of risks associated with counterparty default is critical:

- (1) the credit risk associated with the collateral accepted;
- (2) the market risk of an adverse movement in the price of an asset accepted as collateral due to exogenous factors occurring between the last collateral valuation and collateral realisation;
- (3) the liquidity risk of an adverse movement in the price of an asset caused by an attempt on the part of the Eurosystem to liquidate a potentially large position in that asset.

To address these risks, the Eurosystem framework applies a number of criteria, including credit-quality criteria; accurate valuation on a daily basis; and certain risk control measures⁴ (such as valuation haircuts, variation margins/marking to market, and certain limits), which differ between marketable and non-marketable assets.

First, it should be noted that the fact that a given security is issued on a DLT basis rather than in traditional ways does not necessarily result in different characteristics in terms of credit, market or liquidity risks. In other words, existing eligibility requirements could mitigate these risks in respect of DLT-based securities in the same way as they do in respect of other assets.

Secondly, in certain respects, DLT-based securities may in fact raise lesser concerns when compared to securities issued in traditional ways. This includes the reduction/elimination of manual processes implying potential human errors and settlement risk through atomic settlement, reduced settlement times, and the immutability of transaction history.

Proposals for mitigating relevant risks for DLT-based securities

As aforementioned, as regards eligibility as marketable-assets collateral, DLT-based securities issued outside the DLT Pilot Regime might face difficulties satisfying two requirements in particular: the requirement to be issued with an eligible SSS (or a central bank) and the requirement to be admitted to trading on a regulated market.

Given that the current regulatory framework related to SSSs (in particular, the CSDR) was not designed with DLT in mind, traditional compliance with the criteria set by the Eurosystem may not always be possible for DLT-based settlement systems. It is therefore recommended that the Eurosystem focus on what regulatory, operational or other measures could be applied to mitigate these risks, in a technology-neutral fashion:

Requirement for eligible SSS involvement

(1) Authorisation requirement: the Eurosystem framework generally requires eligible SSSs to be operated by a central securities depository authorised under the CSDR. However, the objectives which CSDR authorisation/supervision aims to achieve can be ensured in alternative ways.

One key objective of the CSDR is to ensure operational robustness and resilience of settlement systems and mitigate risk of disruption. In this context, it should first be noted that, while DLT is a

³ https://www.ecb.europa.eu/mopo/coll/risk/html/index.en.html, last accessed on 26 February 2025.

⁴ https://www.ecb.europa.eu/mopo/coll/risk/riskcontrol/html/index.en.html, last accessed on 26 February 2025.

young technology in capital markets compared to more traditional, centralised databases, it has shown itself to be robust. Moreover, to the extent that financial entities within the scope of the EU's Digital Operational Resilience Act (DORA) – such as, for example, credit institutions or investment firms - are concerned, DORA sets comprehensive standards relating to operational resilience, including on ICT risk management and governance, ICT incident management and reporting, resilience testing, and management of ICT third-party risk.

Moreover, financial entities may also be subject to broader requirements (e.g., governance, organisational, conduct-of-business, and prudential requirements) under existing regulatory frameworks, such as MiFID II or CRD/CRR.

As such, DLT-based securities issued/settled on a platform operated by an entity subject to those requirements should be capable of being eligible collateral, notwithstanding that the platform operator is not regulated under the CSDR.

- (2) Settlement finality: Statutory settlement finality is currently regulated for through the EU's Settlement Finality Directive (SFD) and is limited to securities recorded in book-entry form in CSDs. Since DLTbased securities are currently not captured by SFD, contractual arrangements that ensure settlement of finality should be considered as adequate arrangements.
- (3) Access to Target2: The creation of a DLT-based central-bank money solution see Part 1 of this paper – should enable access to Target2 for DLT-based settlement systems. This underscores the importance of a coordinated approach to both DLT-based central-bank money and a review of eligibility criteria.

Admitted-to-trading requirement

In order to support innovation in European capital markets and enable the further scaling of European DLT-based capital markets, the Eurosystem should consider alternative criteria to the requiring DLT-based securities to be admitted to trading. For example:

- (1) *Liquidity assessment:* The Eurosystem can deploy commonly used measures of liquidity to establish whether DLT-based securities not admitted to trading are sufficiently liquid to be accepted as a marketable asset. These measures can include assessing the number of available price quotes for a security, the number of market-makers and similar indicators.
- (2) Overall limits: alternatively, the Eurosystem could also decide to accept DLT-based securities that cannot be admitted to trading as marketable-asset collateral subject to limits in volume and in time. Such limits would be set to limit risk to the Eurosystem and could be focused on:
 - (a) Volume: can be subject to threshold volume limits (e.g. per issuance, issuer, platform) that are considered to not pose significant risk to financial stability.
 - (b) Time: these measures can be put in place until such a time as regulatory reforms had been adopted in the EU that allow for admission to trading of all DLT-based securities.

Medium term eligibility of DLT-based securities

As indicated above, in the medium term, there is an opportunity to adjust and future-proof the EU regulatory framework in such a way as to enable full and safe scaling of DLT-based markets.

Such adjustments should target the creation of a regulatory framework that is neutral across technologies and settlement business models.

To this end, AFME has put forward proposals⁵ for changes to CSDR that would create a single regulatory framework for settlement systems. This framework could be applied across technology architecture and business models, including settlement systems based on DLT and based on distributed settlement. Such

⁵ See AFME (2024) Use of DLT and Tokenisation in Financial Markets A Proposed Vision and Policy Recommendations ; AFME (2024) Scaling DLT-based Capital Markets - A Policy Roadmap for the EU

a reformed framework would also enable DLT-based securities to be admitted to trading, and hence for such securities to meet the criteria outlined in the Eurosystem legal framework.

The ECB is encouraged to coordinate with the European Commission and other policymakers to arrive at a framework that is future-proof, technology-neutral and that enables the EU to be in the lead with respect to scaling of DLT-based markets



London Office Level 10, 20 Churchill Place London E14 5HJ United Kingdom

Brussels Office

Rue de la Loi, 82 1040 Brussels Belgium

Frankfurt Office Neue

c/o SPACES – Regus, First Floor Reception, Große Gallusstraße 16-18, 60312, Frankfurt am Main Germany

Switchboard: +44 (0)20 3828 2700 Switchboard: +32 (0)2 883 5540 Switchboard: + 49 (0)69 710 456 660

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