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Future European DLT-based Financial Market Architecture

Vision and Recommendations

April 2026

Contents

Executive Summary

- This paper **sets out a vision for the future DLT-based architecture for European capital markets** as well as makes recommendations to European policymakers in relation to the development of policy and infrastructural frameworks in line with this envisaged trajectory.

- To enable connectivity, integration, efficiency, competition and innovation for European capital markets, AFME envisages the development - over the medium term - of a **DLT-based architecture for European capital markets that consists of:**
    1. **A multi-chain DLT network consisting of asset ledgers operated by regulated financial institutions, with interoperability protocols enabling cross-ledger connectivity**. A role for public-sector ledgers is envisaged for DLT-based central bank money and connecting market-run asset ledgers.

    2. **Public-permissioned ledger setups** to provide widespread but regulated access for market participants, with different ledgers providing technical and governance arrangements tailored to one or multiple (financial) asset classes (see figure 2).[1]

- Delivering on this vision requires coordinated policy and infrastructural actions between public and private-sector actors, which are set out in Part II of the paper. In particular, the paper recommends, as immediate priorities:

    1. **Recognition of asset interoperability in policy frameworks**. Interoperability standards at asset, token/smart contract, and protocol layers should be agreed and developed through public-private collaboration. In particular, the legal and regulatory framework should evolve to recognise the asset transferability and control mechanisms and operational settlement finality provided by DLT.

    2. **Progress on making DLT-based central bank cash solutions available (e.g. Pontes), alongside DLT-based commercial bank money solutions**. For Europe to maintain its lead in creating capital markets of the future, providing certainty on DLT-based cash solutions is key.

    3. **Public-private cash ledgers as a way forward for accommodating different forms of DLT-based cash solutions** (central bank, commercial bank, stablecoins) on a cross-currency and cross-jurisdictional basis, with the aim of minimising cash liquidity fragmentation. In addition, public ledgers can play a role in enabling collateral mobilisation for monetary-policy purposes.

    4. **A careful approach to public asset ledgers**. Because market-run asset ledgers, connected through interoperability solutions, present the most viable way forward for scaling, public-sector authorities should carefully assess if public asset ledgers can add any value without undermining existing investments from market participants.

    5. **Collateral eligibility for all DLT securities**. Authorities should immediately focus on enabling the use of DLT-based assets as collateral in central bank credit operations. This can be achieved by clarifying the application of the collateral eligibility framework to DLT-based assets, recognising asset controls and movement by non-CSD DLT platforms, and integrating these platforms into the collateral mobilisation architecture.

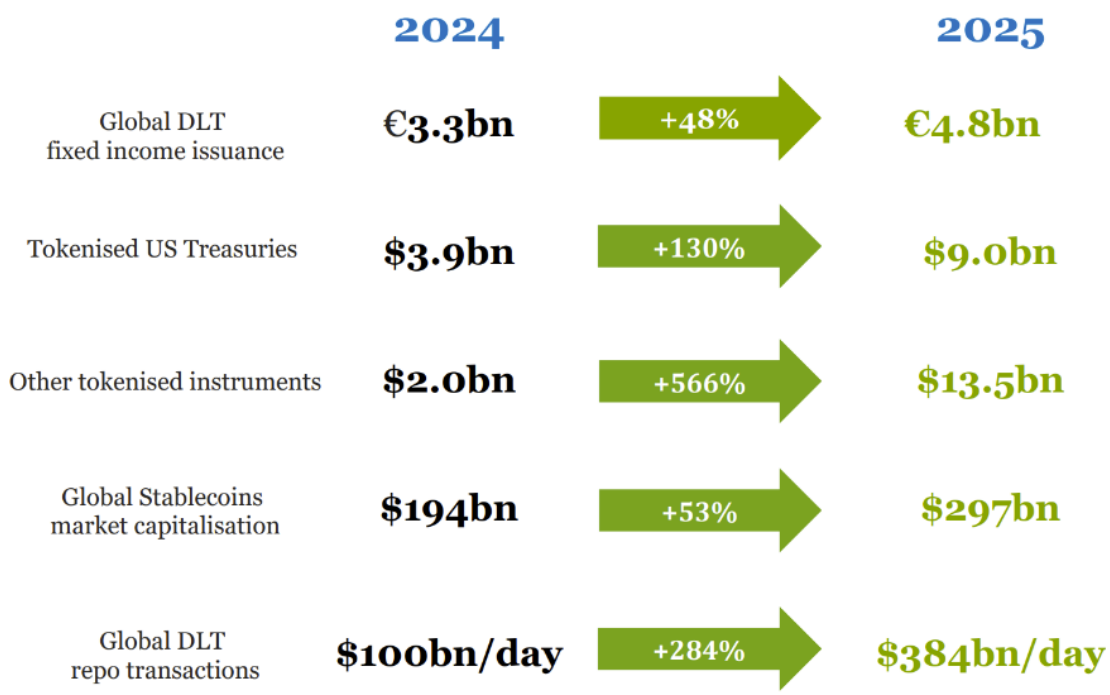
    6. **Delivery of complementary EU regulatory reforms enabling network-based settlement**. European authorities should urgently conclude reforms to establish a permanent regime for DLT-based capital markets infrastructures that enables regulated, distributed, and network-based transactions and settlement at-scale.

[1] Indeed, this is one of the implementation options highlighted by the ECB's own Appia Roadmap.

Introduction

The last year has experienced reinvigorated interest and momentum in DLT-based financial markets, with significant growth in funds, stablecoins, repos, and continued growth in fixed income issuance, particularly in the collateral, cash and fund management spaces (see figure 1 below). There is also clear acknowledgement from European policymakers – through initiatives like the EU Pilot Regime, ECB's Project Appia, UK Digital Securities Sandbox, and the Bank of England's RTGS synchronisation initiative – of the benefits of DLT to the financial ecosystem, and a need to take strategic actions to prepare for tomorrow's DLT-based financial markets and update the market architecture.

Figure 1 – Global activity in DLT-based financial markets



Source: AFME Research

Market activity has been buoyed by increased policy momentum, particularly in the US. These developments also have key implications:

- First, DLT is now widely expected by both public- and private-sector actors worldwide to play a key role in the future of capital markets and financial services, with benefits widely recognised.
- Second, in the past year, increased momentum has given rise to a significant new number of initiatives, at the protocol/platform layer (launching of both Layer 1 and Layer 2 initiatives) and asset layers of the ecosystem. This has to some extent enhanced fragmentation while at the same time enhanced the focus on mutualisation and interoperability across DLT-based networks.
- Third, while Europe was very much in the lead in terms of DLT-based capital markets activity, such activity and momentum elsewhere have grown significantly, requiring greater ambition and urgency among European public and private-sector entities to enable creation and scaling of a new DLT-based market architecture.

These three key implications give rise in turn to important questions about what the medium-term DLT-based market architecture can and should look like to enable resilience, innovation, competition and efficiency of capital markets, and what corresponding public-policy initiatives from European policymakers are needed to enable such an architecture to emerge.

This paper therefore assesses possible future European DLT-based financial architecture models, sets out AFME's vision as to the desired design of such a future architecture, and discusses the required actions to evolve towards a future model.

Part I - Future European DLT-based Capital Markets Architecture

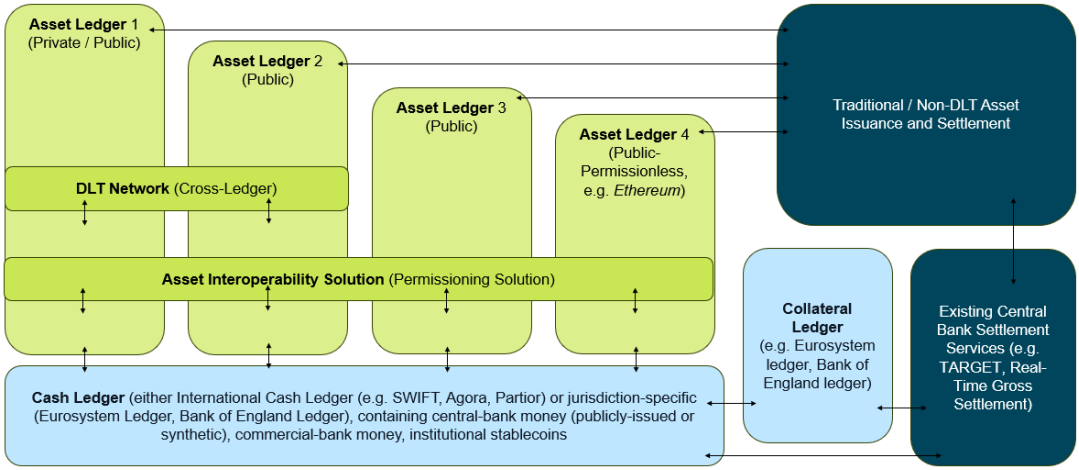
Strong market momentum worldwide and a view that DLT is here to stay as a key technology for the future have led to a string of new architectural and asset initiatives being launched in the last year, in the private and public sectors, and across a wide range of both incumbent and new market participants. All these developments in turn raise questions about what the envisaged 'end state' of DLT-based market architecture may look like.

While the market architecture is still yet developing, Part I of this paper sets out a preliminary vision of the contours of the preferred medium- to longer-term market architecture. Such a vision takes into account both the existing investments and initiatives from public and private sectors.

An assessment of the potential future European DLT-based capital-markets architecture necessarily involves considering envisaged outcomes at different layers of that architecture:

- Underlying Ledger archetypes
- Governance and Set-up of Individual DLT platforms built on ledger archetypes
- Overall Market Architectural model that encompasses different individual DLT platforms and networks.

Figure 2 – Overview Envisaged DLT-based market architecture



Overall Market Architecture

- Market architecture consisting of a (limited) number of DLT networks dedicated to particular jurisdictional and/or asset class requirements
- Networks connected through international market standards enabling interoperability at asset, token, and protocol levels
- Potential for consolidated cash ledger to enable cash settlement, including cross-currency

Individual DLT Network Governance

- Regulated DLT networks that enable at-scale, distributed trading and settlement of DLT-based transferable securities and other assets
- Distributed settlement: regulated entities fulfilling individual roles within DLT networks to enhance resilience, innovation, and competition

Ledger Archetype

- Public-permissioned ledger set-ups enable broad participation among regulated financial ecosystem participants. Participation can be broadened through expansion of private networks or building of permissioning solutions atop permissionless base layers

1.1 Ledger Archetypes

As highlighted in a recent joint industry report on the impact of DLT on capital markets, three main ledger archetypes can be distinguished:[2]

- Private-permissioned
- Public-permissioned
- Public-permissionless

While it is currently too early to predict which DLT initiatives (protocols) will succeed in gaining widespread adoption, there is growing consensus that the optimal set-up will involve ledgers that enable both:

- Wide participation among market participants so as to enable the reaping of network effects; and
- Practices, standards and conventions that enable secure (including in terms of settlement finality, AML, etc.) and efficient transactions across protocols as well as compliance with regulatory requirements.

Given these considerations, we view that ledgers with the greatest potential for capital markets to enable widespread access and compliance will be those with a public-permissioned setup - combining attributes of openness with security. Public-permissioned ledgers combine widespread ability of market participants to deploy activities on the ledger but with restrictions with respect to privileges (such as hosting of nodes).[3]

Such public-permissioned ledger approaches can be achieved – and are in fact already being created - in multiple ways; for instance, by opening up and widening participation in more restricted (private) permissioned networks, or by building permissioning solutions at token, smart-contract or sub-ledger ('Layer 2') level on top of permissionless base ledgers (such as EVM-compatible solutions). This can trigger and synchronise asset movements between and across permissioned and permissionless networks.

What precise ledger setup will be optimal may vary depending on market, jurisdictional or asset class requirements and is likely to be influenced by a number of factors, including: the level of industry adoption, presence of particular participants, governance arrangements, performance of a protocol (e.g. in terms of throughput, cost or downtime), as well as legal, regulatory or locational (sovereignty) considerations.

1.2 Governance of individual DLT Networks

While much attention is paid to the ledger archetypes, the governance and setup of DLT networks built atop these ledgers is also a key consideration in determining the outcome of market architecture. While a shift towards forms of public-permissioned ledger setups is envisaged, the use of private-permissioned ledgers has thus far been prioritised due to regulatory scrutiny and risk appetite. Such governance networks can be highly centralised, with a single entity providing key services - such as notary or settlement services - in ways similar to traditional market infrastructures. On the other end of the spectrum, decentralised DLT networks have emerged in finance in recent years. Such platforms rely significantly on deterministic settlement using rules embedded in smart contracts and purport to operate without intermediary institutions.

The DLT network governance we envisage as likely to produce appropriate outcomes in capital markets, however, sits in the middle of these extremes: regulated, distributed networks that enable the benefits of DLT – connectivity, automation and distribution – to be leveraged while maintaining accountability and flexibility required in capital markets.[4] Such a governance framework is also fully compatible with the vision for a multi-chain architecture based on public-permissioned set-ups, in which interoperable DLT asset ledgers can be operated by regulated actors.

In such a distributed, network-based governance, regulated entities can jointly operate DLT networks that enable transacting and settlement of DLT-based assets. Individual regulated entities can play different roles – be they notary functions (ensuring issuance integrity), provision of settlement services, hosting of accounts and wallets, validation, and/or offering of banking services (such as cash or securities lending). The network can be regulated by legally binding agreements (e.g. schemes). Supervisors can also be present on the network for reporting and oversight purposes. Indeed, there are currently EU regulatory reforms under the Market Integration and Supervision Package pursuing the exact need to "*allow market participants to experiment with a new business model that does not involve a single operator of a settlement system, but rather relies on regulated entities that are individually and jointly required, through the establishment of a settlement scheme, to ensure robust*

[2] Each DLT network archetype has its own defining characteristics, and advantages and disadvantages for widespread adoption and scaling (see Annex 1 for an overview and comparison of different key DLT archetypes).

[3] Indeed, the GFMA Report on the Impact of DLT in Capital Markets (2025) compares the defining characteristics of different DLT network archetypes, with evidence on the benefits of public networks especially when deployed with permissioning mechanisms to assert control and security.

[4] For more background on a vision for a "Technology Financial Infrastructure" enabled by regulated, network-based distributed settlement, and the necessary policy actions to achieve this vision, please see AFME Policy Roadmap on Scaling DLT-based Capital Markets (2024) and Use of DLT and Tokenisation in Financial Markets (2025).

settlement outcomes".[5] The UK Digital Securities Sandbox also purports to allow for the same kind of innovation through distributed settlement.

Such distributed networks serve to enhance market resilience as they help reduce single-point-of-failure risk. At the same, clear accountability ascribed to individual regulated participants ensures market integrity and provides regulatory safeguards. The distributed nature can also serve to enhance innovation and competition, and enable connectivity – especially as the initial proliferation phase of DLT adoption shifts towards mutualisation of networks as shared utility.

1.3 Overarching DLT-based Market Architecture

While the governance and setup of individual DLT networks is a key element – and one in which the DLT-based market architecture is likely to differ from the current market setup – how these networks are linked together in an overarching market architecture will be vital to the economic viability of DLT as a base technology for capital markets.

Considering existing market models and different possible models for the future DLT-based market architecture, three key architectural models stand out as plausible trajectories for the market architecture to evolve towards, as outlined in *Figure 3* below:

Figure 3 - Three key possible future market architectural models

	Description
1. Unified ledger (operated by public sector or public-private arrangements)	A single shared ledger for an individual jurisdiction (e.g. UK, Euro Area) combining different DLT-based money types (e.g. central-bank, commercial bank, stablecoins) or even non-money assets, operated by public-sector institutions or public-private sector arrangements. Currently this model is not yet significantly operational as most unified ledger initiatives are still in development stage (e.g. Agora, Global Layer 1), while some unified ledger initiatives (UK RLN, US RSN, Banque de France DL3S) have been used for pilots and experiments, solely for DLT-based money asset movements.
2. Multi-chain	A market architecture model in which multiple DLT networks are operated by a variety of regulated entities, likely across different distributed ledgers, and are connected through industry interoperability standards and arrangements.[6] Asset ledgers may display concentration along asset class lines.
3. Public-permissionless ledger(s)	DLT networks – likely with permissioning solutions at token, smart-contract or sub-ledger level - based on a single (or strictly limited) number of permissionless chains that provide network effects through widespread adoption, including beyond capital markets as part of the development of a token economy.

The three different possible market architectural models each have their own benefits and potential drawbacks or complications. *Figure 4* below compares the models based on a number of key considerations that influence the viability of DLT-based market architecture (see left column), which are assessed in relation to the key future market architectural models.

Figure 4: Assessment of possible DLT-based market architecture models

	Unified Ledger	Multi-chain	Public-permissionless Ledgers
Ability to generate network effects	Depending on the jurisdictional scope of a unified ledger, network effects would be substantial within jurisdictions, but likely more limited across jurisdictions.	Network effects benefits can be significant, depending on the degree to which non-money assets are concentrated on particular networks and ledgers.	Significant network effects are expected to be generated in an architecture where DLT networks are ultimately linked through a large, international permissionless ledger.

[5] EU Proposal for a regulation regarding the further development of capital market integration and supervision within the Union
[6] The ECB's *Appia Roadmap* (2026) also acknowledges this "multiple linked networks" model as a key implementation option: "Multiple networks offer redundancies that can enhance resilience and can, depending on their set-up, foster competition and facilitate innovation. There could be both competition on services and competition on infrastructures from different utilities."

Settlement atomicity	Atomicity can be achieved within a jurisdiction as DLT-based central bank money, commercial-bank money and assets would all reside on the same network and ledger. However, fragmentation is likely to exist across unified ledgers (cross-currency, cross-jurisdiction), requiring interoperability and limiting international atomicity.	Full atomicity can be achieved within and across DLT networks operating on the same ledger. Efficient and secure cross-ledger settlement will rely on interoperability solutions and standards being in place. The degree to which cash liquidity will be fragmented depend on whether cash is distributed onto asset ledgers or whether (a) separate money ledger(s) exist(s).	A market architecture based on networks that ultimately reside on the same permissionless base layer should enable significant atomicity in the settlement of both money and non-money assets, within and across DLT networks, provided central banks are willing to distribute DLT-native central bank money onto DLT networks based on permissionless ledger.
Regulatory compliance	As a unified ledger is likely to be operated within a permissioned archetype, partially or wholly by public-sector entities, this combination should provide certainty with respect to compliance with regulatory requirements.	The underlying ledger archetypes may impact certainty about at-scale compliance. However, if EU reforms and UK policy initiatives are able to provide a viable framework for regulating settlement schemes, regulatory risk would be significantly assuaged.	Market standardisation and further regulatory/supervisory clarity on compliance with e.g. AML or OpRes regulation is needed to enable at-scale regulatory compliance. Note that technical solutions exist – e.g. with respect to AML/KYC at the token, smart-contract and sub-ledger level.
Resilience, performance, and technical throughput	Particularly if operated in a permissioned environment, resilience and throughput are likely to be sufficient.	Market-run DLTs have thus far demonstrated high levels of resilience and technical performance. Depending on the underlying ledger archetype, there may be uncertainty as to the ability of some (permissionless) base ledgers to accommodate the throughput required to be the basis for capital markets infrastructure. Significant improvements (e.g. through sharding or Layer 2 solutions) are expected in coming years.	Permissionless Layer 1 ledgers have proved to be resilient. Currently, it is uncertain that such ledgers could cope with significant volume required as a basis for capital markets infrastructure, but technical improvements (e.g. sharding, Layer 2 development) are expected to significantly enhance throughput in the coming years.
Innovative potential	Concerns exist about the ability of such unified ledgers to be sufficiently agile and innovative in the face of rapidly-changing market circumstances. The willingness and ability by public-sector actors to bear investments related to such innovation would also impact potential.	Particularly in a multi-chain world where no one ledger or network is fully dominant, market-run DLT networks and ledgers are likely to be subject to significant and constant competitive and innovative pressures. Agility and responsiveness to market needs are also expected to be significant.	Distributed governance where participants can propose new or update token standards is likely to maintain innovation. Moreover, a single base layer that accommodates a variety of DLT networks can enable a competitive environment across DLT networks while enabling network effects benefits.
Economic viability based on commercial implications and costs	Unified ledger development is likely to require significant investment. Moreover, there are questions related to cost effectiveness, the development time required and the degree to which such initiative(s) would achieve widespread adoption.	A multi-chain architecture is expected to be built on a (more limited) number of DLT networks and ledger, many of whom are likely to be in existence already. This reduces the cost of further building out the architecture	While upgrades to existing permissionless base layers may be required in coming years, a markets architecture would be built on existing ledgers which have already secured a significant uptake and ecosystem, likely requiring limited investment.

Overall assessment:

Considering aforementioned criteria for assessing architectural models in their totality, AFME's envisaged structure of a medium- to long-term DLT-based architecture for European capital markets is one mainly based on the multi-chain model, consisting

of a limited number of DLT networks predominantly based on public-permissioned ledgers with likely significant but not full degree of concentration of assets along asset class and regional lines. Such a model would enable innovation and competition and would enable networks and ledger to be calibrated to the needs of individual regions or asset classes, e.g. in terms of regulatory compliance, throughput and latency.

It is expected that public-permissionless base ledgers will play a significant role in such a multi-chain architecture – and indeed convergence towards a limited number may occur, especially if non-capital markets sectors of the economy adopt DLT. However, this development will be contingent upon further changes made to enhance capacity of such ledgers, ensure stability, and provide clarity on governance and solutions and standards for at-scale regulatory compliance. In addition, at least in the medium term, central bank money is likely to reach public permissionless ledgers through interoperability solutions rather than through native issuance. This may also impact industry considerations for adoption.

While the unified ledger model for DLT-based market architecture can in theory generate network effects, the economics of unified ledgers projects remain in doubt: high upfront investment would be required by both public and private actors – possibly stranding or duplicating private investment made in DLT infrastructure – with significant doubts and uncertainties remaining as to the development time, operational cost, functionality and agility of such ledgers to respond to technological advances or changing market demands.

In addition, while unified ledgers can limit fragmentation within jurisdictions, they are unlikely to eliminate fragmentation altogether, as cross-currency and cross-jurisdiction linkages between unified ledger would remain vital to the functioning of capital markets. Moreover, it is not clear that such unification would be desirable: different asset classes and jurisdictions are likely to have different requirements for assets and services. In addition, while we acknowledge the Eurosystem's expressed objective to strengthen European sovereignty through the development of DLT networks and reduce critical dependence on foreign providers of DLT, the network layer of DLT – like the internet – is global by definition and derives its functions and benefits from distribution; therefore, we would highly discourage a localised approach to the network layer of DLT.

AFME does envisage that a singular money ledger – unified across currencies and jurisdictions with the ability to hold central-bank money, commercial bank money and (institutional) stablecoins – may prove beneficial in managing DLT-based cash instruments efficiently across currencies and avoiding cash liquidity fragmentation. A number of (public-) private initiatives have been launched along these lines in recent years and months, and some of these initiatives may capture network effects in the coming year(s) as DLT-based cash solutions mature and become more widely adopted.

Moreover, by connecting to regulated actors with central bank accounts, unified ledgers could play a role in the efficient mobilisation of DLT-based assets for use as collateral for monetary-policy purposes. For example, the ECB has announced that it will begin permitting CSD-linked securities to be eligible as central bank collateral. In the future, linkage should also be established with other regulated actors with central bank accounts (including non-CSD DLT asset ledgers) to allow more maximal collateral mobilisation and ecosystem-wide benefits.

Part II - Towards a Future DLT Architecture – Required Actions

Moving towards a future DLT-based architecture model for European capital markets as envisaged in Part I of this paper – i.e. a multi-chain architectural model with the potential for a cross-currency money asset ledger – implies the need for a number of key public and public-private initiatives, including those related to interoperability, DLT-based money infrastructure, use of DLT-based assets in monetary policy operations and legal and regulatory frameworks for DLT networks and architecture.

These areas are increasingly becoming part of policy discussions in Europe, including in central bank forums (e.g. ECB's Appia Roadmap and initiative). Part II will set out AFME's vision on the required actions in each of these areas, as summarised in *Figure 5* below. These are discussed in more detail later in the chapter.

Figure 5 – Overview of required actions for European policymakers

Key Consideration	Recommendations
Asset interoperability and standards	▪ Actively support public-private initiatives to achieve asset, token, and protocol interoperability. The policy and legal framework should evolve to recognise the asset transferability and control mechanisms (e.g. locking, minting, burning, and token wrapping) and operational settlement finality provided by DLT platforms.
Monetary policy implementation and collateral management	▪ Enable the maintenance of the two-tier banking system by providing DLT-based central-bank money solution and, as necessary, regulatory and supervisory clarity regarding the status of DLT-based commercial bank money liabilities. ▪ Provide legal clarity on the central bank collateral eligibility of DLT-based securities issued by (non-CSD) DLT platforms, including by recognising the operational capabilities of such platforms to pledge collateral and control assets in a sound and reliable manner.
European tokenised central bank money infrastructure(s)	▪ Make available an operational interoperability solution within the shortest feasible timeframe over time ▪ Carefully consider the development of an additional or successor central-bank money solution, in order to limit cash liquidity fragmentation. ▪ Refrain from creating unified ledger initiatives that aim to bring cash and assets onto a single distributed ledger. ▪ Enable the development of a variety of DLT-based non-central bank cash solutions.
International dimension and cross-border and cross-currency links	▪ Continue to engage proactively in international projects (public and public-private) that have the potential to achieve international network effects and create a shared, cross-currency institutional money ledger as part of an overarching DLT market architecture. ▪ Ensure appropriate linkages between Eurosystem and Bank of England projects to avoid duplication and proliferation of such initiatives.
Innovative, safe and resilient new ecosystem	▪ Consider reasonable implementation that does not obstruct innovation using permissionless base layers, including capital requirements ▪ Provide clarifications, as necessary, on the treatment of DLT-based commercial bank liabilities. ▪ Encourage substantial changes to relevant capital markets regulation that enable network-based settlement, including workable and commercially viable settlement schemes under the DLT Pilot Regime that incentivise institutional participation ▪ Facilitate and participate in considerations of how securities law could be harmonised for DLT-based securities to pre-empt legally-induced fragmentation of DLT-based markets in the EU.
Implementation strategy and impact on existing infrastructures	▪ Continue to support regulatory and supervisory coordination and interoperability with existing infrastructures and transitional needs.

2.1 Asset interoperability and standards

Background:
Asset interoperability is critical to ensuring that assets can be transferred and exchanged between different ledgers whilst maintaining their data and programmable functionalities, optimally allowing for atomicity.

This is especially important in a multi-chain market architecture to avoid breaking of liquidity when assets (e.g. securities) might be issued on different ledgers and form liquidity pools across different ledgers

While congregating asset types on particular ledgers may reduce the fragmentation risk, more sophisticated and accountable cross-network financing and asset interoperability standards and market practices (e.g. for burning and minting) remain in development. In addition, how trading desks offset risks and manage liquidity will need to be taken into account.

Unified Ledger	Multi-chain	Public-permissionless Ledgers
Assets are issued on market-run DLTs, and settled with a cash solution offered by the unified Eurosystem ledger. If this ledger also includes assets, assets can be issued and transferred on this ledger. It will, however, need access to non-EU DLTs	Assets are mostly issued and transferred, within the same DLTs, which have liquidity pools and network effects for particular assets. Assets can also be transferred and usable across distinct DLTs which require connectivity to each other to facilitate transactions	DLT networks, if based on a single base layer (e.g. Ethereum), would be able to achieve interoperability on the basis of the common protocol. Asset transfers can also be conducted between different Layer 1 and/or Layer 2 chains.

Envisaged trajectory/outcomes:
It is envisaged that different levels of the DLT-based market architecture require standardisation to enable reaping of network effects across DLT platforms and ledgers, as well as between traditional and DLT-based market architecture.

In particular, it is envisaged that standards are developed for the following architectural layers:

- Assets: to ensure the smooth operation of markets, interoperability with traditional systems and economic fungibility with existing formats of securities (e.g. 'traditional twins'), common asset documentation standards facilitating asset lifecycle events are key. Existing standards – e.g. ISDA Master Agreement for derivatives, ICMA Common Domain Model for bond and repo transactions – should therefore be applied within the DLT-based market architecture.
- Tokens: while asset standards are vital for ensuring financial asset integrity and capital markets efficiency, similarly, token standards are key to ensuring tokens can be held, exchanged, and transferred within a distributed ledger network, with associated ownership rights. Existing standards developed by individual ledgers or networks – e.g. ERC for Ethereum/EVM-compliant ledgers, SPL for Solana, DAML for Canton Network - can be leveraged for this purpose.
- Protocols: different DLTs are governed by different protocols, which set out network governance, including network data structures, node communication and rules, transaction validation, and how network consensus is achieved. For example, the Ethereum Virtual Machine (EVM) defines how smart contracts are written, deployed, and executed, and this common execution standard enables a wider ecosystem of compatible chains, applications, liquidity pools, and developer tooling. While technical solutions exist to enable interoperability across networks – e.g. centralised bridges and hashed timelock contracts (HTLC) – protocol standards that, for instance, cover key aspects of transactions (e.g. asset transferability, locking, minting, burning, token wrapping, and settlement finality) are needed as a priority. These standards, if recognised by the policy and legal framework as well as market practice, would also help fulfil legal requirements for networks, operators, and participants. Enabling interoperability at this level, therefore, is about enabling/ensuring common market practices, conventions and standards through technological innovation.

Recommended actions:

- Interoperability requires collective action, which may be difficult to sustain by private industry alone. The ECB and Bank of England (and other public authorities) should therefore participate in experimenting with interoperability solutions, including possibly connecting their cash ledgers to different solutions, and maintain a role in establishing and agreeing protocol interoperability standards with the industry.
- The policy and legal framework should, as a priority, evolve to recognise the asset transferability and control mechanisms (e.g. locking, minting, burning, and token wrapping) and operational settlement finality (incl. for DvP, PvP, DvD, etc.) provided by DLT platforms. Experiments through existing central bank money initiatives (e.g. Pontes) can help provide insights into asset movements and control, and whether policy improvement and further legal assurances are needed going forward.
- Authorities should also prioritise policy measures that will encourage interoperability across DLT-based market structures/operations, technology, and associated laws/regulations, thus reducing related market fragmentation and costs. For example, developing common technical standards for cross-ledger/multi-ledger activity (e.g., covering

technology, data, privacy, regulatory reporting, audit/assurance, custody/settlement (asset safeguarding), operational resilience/prudential (safety and soundness), AML/CTF, private international law and tax) would also help promote cross-ledger/multi-chain activities towards more interoperability and market integration.

2.2 Monetary policy implementation and collateral management on DLT

Background:

DLT can yield significant benefits to the functioning of capital markets and support efficient monetary-policy transmission, including - over time - through the expansion of the types of assets that could meet collateral eligibility criteria. Expanding the pool of collateral available through widening collateral eligibility, faster speed of mobilisation, and operational programmability would help meet global markets' demand for high quality collateral. The US authorities, for example, have already confirmed that the regulatory treatment of financial collateral (including for capital purposes) is technologically neutral, i.e. irrespective of whether DLT is used to confer legal rights to securities.

In order for this to be possible, key actions required include:

- Creation of instruments and solutions necessary to enable two-tier banking system within a DLT-based architecture, maintaining key monetary policy channels. This includes in particular the creation of DLT-based central-bank money and permission to develop and use commercial bank money solutions
- Clarity around the eligibility criteria and operationalisation of DLT-based collateral for the purposes of central-bank credit operations, including for DLT platforms with central bank accounts (including non-CSD DLT asset ledgers).

European central banks have initiated DLT-linked central-bank money solutions, and industry is increasingly launching initiatives to make commercial-bank money available *on-chain*. Moreover, ECB as part of its Appia initiative and Bank of England as part of the Digital Securities Sandbox have indicated a desire to consider how DLT-based assets could be brought into the central-bank collateral frameworks.
Below sets out the trajectory and outcomes envisaged by AFME in these areas.

Envisaged trajectory/outcomes:

DLT enables a more distributed and network-based architecture for capital markets. This can have significant beneficial implications for capital markets and the financing of the real economy, through enhanced market efficiency and resilience, but also by enabling greater market connectivity, and expanding access to markets.

From a monetary policy perspective, DLT can provide positive enablers, provided the correct policy, legal and operational provisions are put in place:

Monetary policy transmission:

- DLT is likely to entail changing roles for capital-market participants – and possibly even a degree of disintermediation of some participants. Whether DLT will also entail significant changes to monetary policy transmission channels is currently a matter of discussion: DLT-based cash solutions are still in development. While stablecoins have seen rapid progress in recent years, it is expected that DLT-based commercial bank money will become more widely available and applied, especially as wholesale capital markets shift towards DLT-based architecture (see also Part 2.3).
- AFME envisages that while new forms of cash will have a role to play in capital markets (e.g. in relation to facilitating crypto-asset trading, for cross-border payments or in frontier markets), significant erosion of the two-tier banking system would be undesirable from both an economic and monetary-policy perspective: as has been confirmed by recent research – including analysis performed by central banks[7] – undermining of the two-tier banking system is likely to adversely affect credit provision to the real economy, particularly smaller firms dependent on banking credit. Significant erosion of two-tier banking systems also has potential to weaken direct monetary policy transmission channels.
- Whilst the development of DLT-based central bank money solutions remains a priority, AFME envisages that it will be vital for policymakers to enable the development of a variety of DLT-based cash solutions both to maintain the two-tier money system and broaden settlement choice for end users. In addition to regulatory clarity for stablecoins, this requires a confirmation of the technology-neutral treatment of DLT-based commercial bank money. It is unlikely that enabling access to central-bank money for issuers of new cash solutions will serve as a mitigant against weakening of monetary policy transmission channels, given the inability - both from a regulatory and organisational expertise perspective - to back such new solutions with risky credit instruments (as opposed to safe, mainly government-issued instruments).

Collateral mobilisation:

- Important for the smooth implementation of monetary policy is not just the availability of DLT-based cash solutions; the ability for DLT-based transferable securities to be mobilised, pledged and managed as collateral – including in transactions with central banks – is key as well.
- AFME envisages that DLT can assist efficient collateral mobilisation: both through enhanced automation and transparency on asset holdings, as well as, over time, the ability of DLT to help bring a wider variety of assets within the capital markets

[7] See, for instance, Wang (2025) Banks in the Age of Stablecoins: Some Possible Implications for Deposits, Credit, and Financial Intermediation, *FEDS Notes,* https://www.federalreserve.gov/econres/notes/feds-notes/banks-in-the-age-of-stablecoins-implications-for-deposits-credit-and-financial-intermediation-20251217.html#fn1

perimeter as it helps to enhance secondary market tradability and liquidity of these assets; this will also enable a wider variety of assets to be mobilised as collateral. Such developments can positively affect both monetary policy implementation, capital markets efficiency, and access to capital markets.

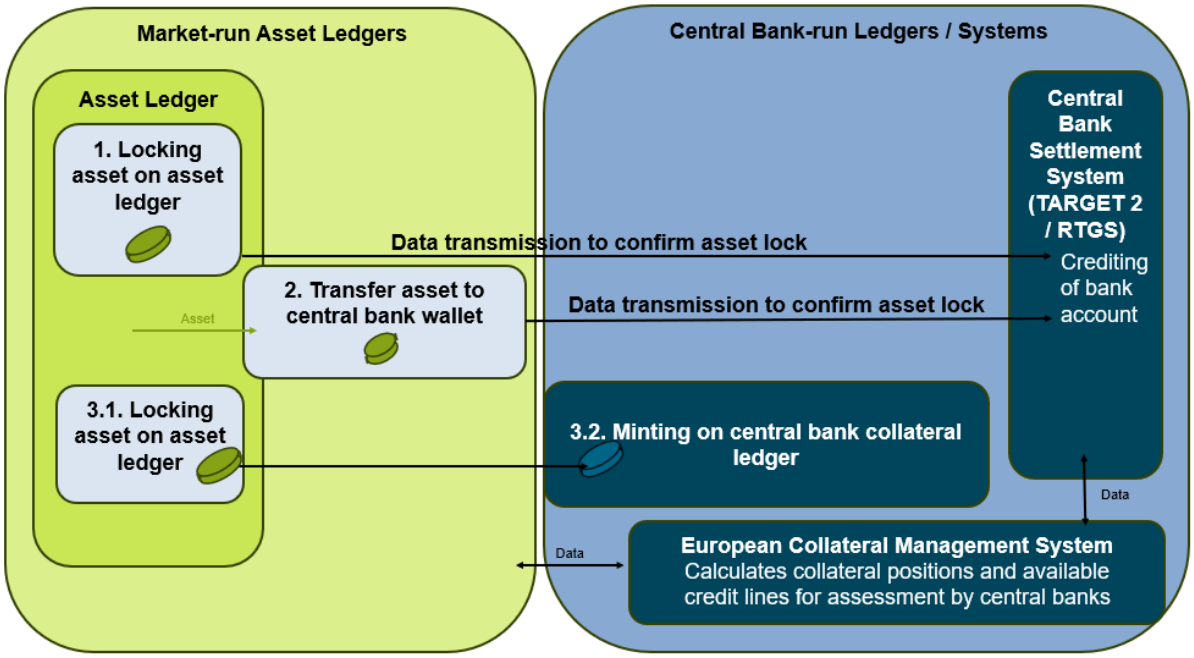
- A key driver for scaling DLT-based markets - as well as for the smooth implementation of monetary policy in a DLT-based market architecture - is the ability – both legally and operationally - to pledge DLT-based assets as collateral in central bank credit operations. The Eurosystem will enable the collateral eligibility of CSD-linked securities from end-March 2026, and the UK authorities are granting central bank collateral eligibility to securities issued through the Digital Securities Sandbox.
- AFME has published detailed proposals outlining how DLT-based assets could be brought into the Eurosystem collateral eligibility framework, both in the short-term – key to continuing momentum for the development of European DLT-based capital markets – and over the medium term.

In addition to meeting the legal definition of collateral eligibility, the operationalisation of DLT-based collateral mobilisation will also need to be considered. There are several options available to the Eurosystem to consider, and the industry prefers a pragmatic route that would minimise the number of bridges required between DLT platforms and optimise operational efficiency.

For the Euro Area/Eurosystem, AFME envisages that DLT-based collateral assets held in eligible DLT platforms (based on robustness assessment as outlined in the AFME proposals, and also any relevant criteria under the EU reforms for DLT account keepers) can be mobilised:

1. Data on DLT-based collateral assets can be sourced by the European Collateral Management System (ECMS) in ways similar to currently done for assets held at CSDs or Triparty Agents.
2. ECMS can use this information to perform calculations on the collateral position and credit lines available to individual institutions.
3. Mobilisation instructions are provided with respect to DLT-based collateral for assessment by a relevant national central bank (NCB). DLT platforms may need to update and/or establish new contractual and operational relationships with NCBs.
4. If eligible, mobilisation of collateral (settlement) can be effectuated in a number of ways:
    - Connection of DLT-based platform to Target-2 Securities (T2S): for DLT platforms to establish direct connection to T2S is an option. Transfers can take place between accounts / wallets (as is the case today). Due to the costs of building additional connectivity from the Eurosystem and participants, the Eurosystem would need to consult on the operational set-up and cost of APIs, inter alia. However, this option is likely to be operationally complex, as both T2S and the DLT platforms would need to establish additional connectivity, thereby incurring additional costs.
    - Recognition of the DLT platforms' ability to control assets:
        - Lock the asset on the ledger on which it resides. Locking of the asset with a controls account can trigger a central-bank money transaction (e.g. in T2 or on a Eurosystem ledger with tokenised central bank money)
        - Transfer of asset to central bank wallet: the asset can be transferred to a centralised collateral account held on the DLT platform (e.g. an NCB/ECB wallet). This would require NCBs to host nodes or hold wallets on eligible DLT platforms (and subsequent ledger), either directly or through custody agent. For the duration of the transaction, only the DLT platform would have control over the assets' mobilisation. Once a transaction has matured, the platform would mobilise the assets back to a centralised account / wallet. In case of default by the collateral provider, the platform would transfer the assets to the secured party (collateral receiver).
        - Lock and mint: locking the asset token on the distributed ledger on which it resides and minting a collateral token on a unified ledger (e.g. a Eurosystem ledger or avoiding a need for NCBs to hold accounts/host nodes on multiple asset distributed ledgers), with the Eurosystem ledger interoperating with central bank money through interoperability with T2 or DLT-based central bank money.

Figure 6 Operationalisation of DLT-based central bank collateral transactions: three different possible ways of posting DLT-based assets in exchange for funds



For each of options listed under step 4, further legal/regulatory clarity may need to be established in terms of a DLT platform's ability to ensure:

- Settlement finality
- Accuracy of books and records
- Asset encumbrance procedures
- Counterparty default protocol
- Regulatory licensing status
- Other applicable (e.g. ECB's Single Collateral Management Rulebook for Europe)

For the UK, the legal, policy, and operational criteria for enabling central bank collateral eligibility can build on lessons from the Digital Securities Sandbox. However, we view that participation in the DSS should not be a prerequisite for achieving central bank collateral eligibility, and also to avoid the risk of the DSS becoming a bottleneck for broader DLT adoption.

Recommended Actions:

Cash

- Enable the maintenance of the two-tier banking system by providing DLT-based central-bank money solution and,
- As necessary, provide regulatory and supervisory clarity regarding the status of DLT-based commercial bank money liabilities.

Collateral eligibility frameworks:

1. Legal and Regulatory Considerations

- It is recommended that the ECB and Bank of England fully enable the collateral eligibility of DLT-based transferable securities through clarifications to their collateral eligibility frameworks.
- These changes are outlined in AFME's position paper and can consist of both short-term and medium-term adjustments:

Short-term:

- Focus on the underlying credit, market and liquidity risks of DLT-based securities in the assessment of their eligibility as collateral. A key criterion for whether DLT-based assets are admitted as collateral in central-bank credit operations should be whether these risks – as mitigated through regulatory, operational and contractual measures – are within the scope of existing collateral frameworks, rather than whether the assets comply with procedural requirements that may not be compatible with DLT-based assets. In particular, it is recommended that the ECB and Bank of England consider the operational robustness of DLT platforms – through compliance with existing relevant regulations (e.g. CRD, Operational Resilience rules) and/or national authorisation and licensing - as well as underlying indicators of liquidity of DLT-based securities such as the number of quotes for a DLT-based transferable security.

Medium-term:

- Consider compliance with the updated EU DLT Pilot Regime and UK Digital Securities Sandbox as a key criterion for admission as collateral of DLT assets. As regulations, notably the EU DLT Pilot Regime, are adjusted to enable larger-scale DLT platforms to be operated by regulated financial institutions, DLT-based transferable securities recorded through such platforms should be considered to be eligible given the robustness of records to ensure issuance and transaction integrity. Eligible securities issued through DLT settlement systems, trading and settlement systems, settlement schemes, and held by DLT account keepers with central bank accounts should be considered as eligible as collateral for central bank monetary policy purposes, on a permanent basis.

2. Operational Considerations

Short-term:

- As soon as possible, assess the operational criteria of DLT platforms (including DLT SS, TSS, digital FMIs, account keepers) against the requirements for current eligible settlement systems. The operational criteria should include governance, controls, resilience, safekeeping, record keeping, settlement finality, asset encumbrance procedures, and default protocols in relation to asset locking, transfer, and minting for the purpose of programming collateral. The criteria should ensure that an activity over a secured asset cannot happen unless both parties agree and allow for the secured party to rightfully take control of the asset under pre-agreed conditions.
- As a first step, the criteria can be mapped and assessed against the outcome that is achieved from granting collateral eligibility to CSD-issued and -registered securities.
- Once a DLT platform meets the criteria as part of the central bank's assessment, the central bank should recognise its ability to programme collateral movements by 1) locking assets through control accounts and/or 2) transfer assets to a centralised account for the duration of transactions, and/or 3) locking assets and minting tokens in the Eurosystem's own ledger.

Medium-term:

- Fully connect the Eurosystem and Bank of England collateral system to the multi-chain network of market-run DLT asset platforms. With sandbox regimes moving to permanent implementation, and distributed settlement networks fully live and interoperable, DLT notaries will take up a role as single-source-of-truth, and reconcile transactions in real-time with network participants. The network of participants can also be interlinked to price oracle(s) to update pricing in real-time.

2.3 European multicurrency tokenised CeBM infrastructure(s)

Background:

To enable the issuance, trading, mobilisation of DLT-based assets on the future DLT-based architecture requires the availability of DLT-based cash solutions. Key developments in DLT-based capital markets in the past 1-2 years have centred around the emergence of at-scale cash settlement solutions.

For wholesale markets, the possibility of settlement in central bank money will remain critical. The ECB has taken significant steps towards trialing and making available DLT-based central bank cash solutions, including ongoing work and commitment to operationalise a central bank cash solution based on T2S (Pontes) by Q3 2026. However, other cash solutions, in particular DLT-based commercial bank money solutions and regulated stablecoins are expected to broaden settlement options for market participants and play an increasingly important role in wholesale markets (see Annex 2 for details).

Envisaged trajectory/outcomes:

As outlined in Part I, AFME envisages a multi-chain DLT-based market architecture as a most likely and desirable market architectural model. This implies that a certain degree of fragmentation in terms of the ledgers on which transferable securities reside is both likely/inevitable and -within limits – still economically viable.

Whilst there are advantages of having DLT-based cash solutions reside on the same ledger as assets, for example allowing atomicity, there will exist a tradeoff with fragmentation in a multi-chain DLT-based market architecture. Such fragmentation is undesirable with respect to cash instruments: efficient liquidity management requires that market participants be able to pool, manage and transact cash instruments in a consolidated manner.

Focusing on central-bank money, therefore, we envisage integrated solutions. These can take different forms over time as the market architecture matures:

Medium-term:

Architectural overview

- For the foreseeable future, interoperability cash solutions can sufficiently enable consolidated and efficient central-bank money management. Such solutions – including the solutions currently being developed as part of the ECB's Pontes Pilot and the Bank of England's RT2 synchronisation interface - are based on interoperability mechanisms linking asset ledgers to central banks' Real-Time Gross Settlement (RTGS) systems such as T2S or UK RTGS. By doing so, they enable settlement of cash legs of DLT-based transactions in central bank money without fragmenting the management of central bank money liquidity.
- This implies that beyond existing initiatives, no additional infrastructural initiatives are required from central banks for the time being. In a similar fashion, synthetic central-bank money solutions based on omnibus accounts can provide linkage between asset ledgers and central banks' RTGS systems.

Programmability

- While it is envisaged that central banks will provide governance for smart contracts on central-bank controlled ledgers – as is, for instance, envisaged under the ECB's Pontes solution - interactions with the asset ledger should allow for open programmability. Indeed, transaction programmability is mainly envisaged to be relevant on the asset-ledger side, transmitting automated cash settlement instructions to the RTGS system.

Oversight

- Current central bank cash experiments (e.g. Pontes) will give valuable insights to authorities on the eligibility and risk-based criteria for linking central bank-run cash ledgers to asset ledger(s). Once these criteria are established, the Eurosystem can use them to further ascertain the criteria for which it would be comfortable with issuing CeBM onto asset ledgers.

Longer-term:

Architectural overview

- Over the longer run, as the stablecoin solutions mature and additional cash solutions such as DLT-based commercial bank money come online, a consolidation in the number of ledgers is expected.
- Indeed, depending on market evolution, there may be merit in consolidating cash solutions onto a single or strictly limited number of shared cash ledger(s) on which can reside DLT-based central-bank, commercial bank and (institutional) stablecoins, thus avoiding or limiting the fragmentation of cash liquidity and enabling institutional cash settlement and management in a DLT market architecture. In such a scenario, central banks could issue native DLT-based central bank money to eligible parties directly onto such a ledger; alternatively, interoperability mechanisms linking a cash ledger to RTGS systems can continue to provide a workable solution.

- We can envisage a setup where core settlement is done via central / commercial bank money on a central ledger, and well-regulated stablecoins are used for certain other use cases where they are particularly useful:
    - Cross-border / global digital markets
    - On a variety of blockchains where there is a desire to have asset and cash on the same ledger
    - To support issuer and investor needs and functionalities such as programmability / conditionality

Initiatives have been launched – both private and public-private in nature - that may offer a promising basis for such a consolidated cash ledger solution. These initiatives are, however, still at an early stage and developments must be monitored closely. Avoiding fragmentation across cash-ledger initiatives and limiting the scope of such projects to DLT-based cash instruments – e.g. avoiding expanding the focus to the asset space – are important elements in successful scaling of a consolidated shared cash ledger.

Oversight
Consolidated cash ledgers, as they emerge, can for oversight purposes, be treated as payment systems in accordance with current principles (which may need to be updated for the DLT context). Central banks can define criteria for participants of these systems as well as asset ledgers that interoperate with such systems.

Recommended Actions:

- Focus on making available an operational interoperability solution within the shortest feasible timeframe over time*:* it is considered key that any uncertainty around an operational interoperability solution (e.g. as announced as part of the Pontes initiative) be kept to a minimum.
- Do not unduly pursue the development of an additional or successor central-bank money solution: while it is envisaged that distributing central bank money directly onto a distributed ledger (i.e. DLT-native central bank money) can enhance atomicity, it is also vitally important that cash liquidity fragmentation be limited. Hence, it is recommended that central banks proactively monitor and engage with initiatives with the potential for developing into a consolidated cash ledger, but do not initiate precipitous initiatives without taking stock of progress of existing initiatives with the market. A functioning interoperability solution linking asset ledgers to RTGS systems is considered sufficient for the time being.
- Refrain from creating unified ledger initiatives that aim to bring cash and assets onto a single distributed ledger. While, as indicated, there is a case for central banks to play a proactive role in initiatives aimed at reducing cash liquidity fragmentation, it is unlikely that initiatives aimed at creating a single ledger for cash and assets operated by central banks will yield optimal results for architectural resilience, innovation, efficiency, agility for meeting the demands of specific asset classes, nor prove economical.

- Separately, policymakers should enable the development of a variety of DLT-based non-central bank cash solutions. In wholesale capital markets, these solutions – including DLT-based commercial bank money and stablecoins – maintain different legal, operational, and technological characteristics that might be suitable for different asset classes, clients, and use cases, and therefore enabling their use for settlement would broaden choice and create flexibility for end users (see Annex 2). In particular, policymakers should actively work with ecosystem participants as initiatives on DLT-based commercial bank liabilities develop, to ensure that their legal and regulatory treatment allows for innovation.

2.4 International dimension and cross-border and cross-currency links

Background:

As outlined in Part I of this paper, cross-currency and cross-jurisdictional interoperability are likely to be key prerequisites for any of the possible DLT-based market architectural models.

As the market architecture is still in a relatively early stage of development, design elements, including cross-border and cross-currency links, are still in an early stage and under active development. This implies a more gradual and agile approach is needed from policymakers. This notwithstanding, below will set out potential envisaged trajectories on how international connectedness can be ensured:

Envisaged trajectory/outcomes:

As highlighted under section 2.3, limiting fragmentation in the money layer - within and across currencies and jurisdictions - is of importance to ensuring the efficiency of liquidity management and overall market functioning.

To this end, AFME envisages the emergence of a limited (or even single) cash ledger that can, across currencies, hold private money and either hold or link to central-bank money solutions and can service the functioning of (wholesale) capital markets. DLT platform projects have been launched in recent years and months that have the potential to generate network effects in this respect. Both convergence across those projects and ensuring maintaining a narrow focus of these initiatives on cash and money solutions are relevant elements in enabling such network effects.

For European policymakers – in particular central banks – it is relevant to proactively monitor and participate in these projects to ensure that:

- An appropriate scope and connectedness to solutions implemented in Europe, in particular interoperability solutions to T2S and RTGS systems.
- Access on a global scale to European currencies within the emerging DLT market architecture.
- Leveraging of existing projects to enable network effects to emerge and avoid a proliferation of projects (be they public, private or public-private in nature). This will be key to ensuring economic viability of solutions.
- Where relevant, preserve the operational efficiency and economic benefits (e.g. multilateral netting) available in current FX markets

Recommended Actions:

In relation to the design of DLT-based central-bank money, it is recommended that central banks:

- Continue to engage proactively in international projects (public and public-private) that have the potential to achieve international network effects and create a shared, cross-currency institutional money ledger as part of an overarching DLT market architecture.
- Ensure appropriate linkages between European projects (e.g. the ECB's Appia workstream, RTGS synchronisation) and international projects to avoid duplication and proliferation of such initiatives.

2.5 Innovative, safe and resilient new ecosystem

Background:

A transition towards a DLT-based market architecture requires a legal, policy, and regulatory framework that is robust and sufficiently flexible and supportive of innovation. Both the EU and UK have taken important steps towards allowing market participants to experiment, e.g. through ECB trials and experiments, DLT reforms under the EU Market Integration and Supervision package, and the implementation of the UK Digital Securities Sandbox. DLT offers an unprecedented opportunity to review and revise the market architectural model in ways that enhance resilience, innovation, connectivity and competition.

Focus must now be on enabling the sustainable and resilient scaling of the DLT-based market architecture, as set out in Part I of this paper. This will require a number of ambitious steps to enable network-based trading, settlement, and market participation. In addition, changes to the framework are required in the areas of using of public-permissionless ledgers, ensuring the prudential framework is fit-for-purpose, and harmonising securities law.

Envisaged trajectory/outcomes:

Network-based capital markets

To pave the path towards the creation of a multi-chain architecture for future capital markets, AFME envisages that a regulatory framework needs to enable:

- The full benefits of DLT in terms of resilience, innovation and competition by enabling efficient, automated settlement through a distributed and network-based model.
- Scaling of a robust DLT-based market architecture by enabling larger-scale financial institutions to make viable investments in DLT-based architecture.

In particular, this would require further adjustments to existing regulations, focused on enabling at-scale DLT-based settlement of transferable securities to occur in a regulated network allowing for distributed, broadened, and network-based participation by issuers, investors, and financial institutions. The current proposed reforms to the DLT Pilot Regime already acknowledge this potential.[8] While the proposals present a positive direction / evolution of the EU framework for DLT-based capital markets, a number of issues require further improvement particularly in light of the pace of international policy developments to recognise – and embed - the transformative potential of DLT in permanent legal and policy frameworks. In particular, the need to enable the creation of settlement schemes between eligible DLT account keepers (e.g. credit institutions and investment firms) that leverage the Eurosystem's DLT-adapted wholesale central bank money solutions.

In the UK, the Digital Securities Sandbox offers a viable pathway to experiment with network-based settlement. However, as international market dynamics accelerate at pace, the EU and UK should explore how – on a permanent basis – they can enable the use of DLT as a basis for a new market architecture that promotes innovation, connectivity, resilience and competition, rather than one that replicates the existing capital market architecture, and its shortcomings, on DLT. Both the EU and UK should also engage with other jurisdictions to develop common and consistent approaches to promote cross-border DLT-based activities.

Regulatory treatment of permissionless ledgers

As public-permissionless networks may play a significant role in the future capital markets architecture, the regulatory framework should not constrain banks' ability to participate in and experiment with such networks.

Current Basel standards relating to the prudential treatment of DLT-based assets are based on the erroneous assumption that in practice, permissionless ledgers are unable to meet requirements in relation to design of the networks on which DLT-based assets run and the regulation of ledgers.

AFME envisages that operational concerns related to ledgers are, can and should be addressed through design solutions at token, smart-contract or sub-ledger level and through operational resilience or market infrastructure regimes rather than punitive prudential requirements. [9]

Securities law

A key cause of fragmentation in European capital markets – both based on traditional infrastructure as well as distributed ledgers – relates to securities law fragmentation, affecting issuance as well as lifetime servicing of securities. DLT-based markets arecurrently at a nascent stage, creating an opportunity to consider securities law harmonisation without significant legacyconsequences or the functioning of DLT-based markets. AFME is therefore supportive of exploring a harmonised regime at EU-level ('28th' regime) covering securities issued on distributed ledgers.

Recommended Actions:

- Ensure reasonable implementation of capital requirements in ways that do not obstruct innovation using base layers permissionless in nature, and to urge at international level of review and revision of the Basel SCO60 standards.
- Promote cross-border DLT-based capital markets activities, including potentially through the use of cross-borders sandbox arrangements. It is critical to reduce the regulatory burden(s) associated with complying with multiple regulatory regimes when deploying DLT solutions on a cross-border basis.

In relation to the EU, it is recommended that the ECB/Eurosystem:

- Encourage substantial changes to relevant capital markets regulations that enable distributed settlement systems, including workable and commercially viable settlement schemes under the DLT Pilot Regime that incentivise institutional participation. A strong vision for Appia to make network-based market participation possible and scale transactions through the new EU settlement scheme models would help to redesign and optimise European market architecture.
- Facilitate and participate in considerations of how securities law could be harmonised for DLT-based securities to pre-empt legally-induced fragmentation of DLT-based markets in the EU.

[8] The EU's Market Integration and Supervision Package state "the Pilot should allow market participants to experiment with a new business model that does not involve a single operator of a settlement system, but rather relies on regulated entities that are individually and jointly required, through the establishment of a settlement scheme, to ensure robust settlement outcomes".
[9] See joint trade associations letter on BCBS Cryptoasset Exposure Standard https://www.gfma.org/wp-content/uploads/2025/08/bcbs-prudential-letter-final-public-version.pdf

2.6 Implementation strategy and impact on existing infrastructures

Background:
As part of Appia blueprint (to be launched in H2 2028), the ECB will outline how its identified approach to the future DLT-based architecture will be implemented. This will include the overall impact on the ecosystem, in terms of network effects and adoption, as well as the impact on existing infrastructures. The Bank of England is similarly assessing the implications of the use of DLT for wholesale capital markets, including through the permanent introduction of framework for digital FMIs.

Envisaged trajectory/outcomes:

- It is likely that whilst DLT adoption is maturing, there will be parallel systems (traditional and DLT-based) coexisting in operation for the foreseeable future. Both systems will require linkage with a critical mass of market participants and T2S services and RTGS.

Recommended Actions:

- Ensure regulatory and supervisory coordination: the Eurosystem and Bank of England should ensure coordination with each other as well as other key international jurisdictions. As not all major jurisdictions will have DLT-based central bank money solutions, the Eurosystem and Bank of England should also ensure that their respective frameworks and solutions support cross-border settlement and fungibility with international commercial bank money solutions (including deposit tokens and stablecoins).
- Support interoperability with existing infrastructures and transitional needs: the Eurosystem and Bank of England should take an active role in supporting interoperability with existing infrastructures whilst promoting innovation and competition.
- Support DLT-based money distribution and collateral mobilisation at pace: building on existing initiatives (Project Pontes, RTGS synchronisation, the UK Digital Securities Sandbox), the Eurosystem and Bank of England should establish criteria for connecting to asset ledgers for cash and collateral purposes at pace.
- Coordinate the funding of DLT-based cross-border projects and wide private market participation. For example, setting the industrial strategy for the deployment of DLT in international capital markets and bringing new/existing FMI providers, banks/dealers, and asset manager/owners together would help accelerate DLT adoption.

Annex

Annex 1 : Comparison of Current Different DLT Archetypes & Initiatives

	Public-permissionless	Public-permissioned	Private-permissioned
Examples	Ethereum, Circle Arc, Stripe Tempo, Solana, BASE	SWIAT RL1, Polymesh, SWIFT, Canton	R3 Corda, Hyperledger Fabric, Partior, Google Cloud's Universal Ledger
Attributes	Widespread access, decentralised governance (including potential for enhanced resilience) transparency	Combines public network with a permissioned layer (e.g. through Layer 2)	Private governance, high level of authentication and privacy. Worth noting that some of private DLT constructs are shifting to becoming more accessible and open-source over time
Governance arrangements	Open governance on Layer 1. Layer 2s can have node permissioning	Open governance with controlled access by verified actors and node permissioning	Closed ecosystem, with the level of permissioning determined by each solution and its participants
Advantages for scaling	Broad accessibility enables network effects	Accessibility and privacy; token control; higher throughput	Regulatory certainty; privacy & control
Disadvantages for scaling	Perceived concerns with throughput, order sequencing, lack of privacy and confidentiality, and regulatory challenges around settlement finality and prudential treatment	Balancing accessibility with permissioning, governance, and authentication	Closed ecosystem
Cash distribution	Difficult to foresee central banks establishing interoperability and/or issuing/distributing cash on public, permissionless ledgers	Cash interoperability is / can be established. Distribution tbd – restrictions / allowlisting of platforms may need to be considered	Cash interoperability is / can be established

Annex 2 – Comparison of General Characteristics of DLT-based money solutions in the context of scaling for DLT-based Market Architecture[10]

	DLT-linked central bank money – Interoperability Model	DLT-linked central bank money – Distribution Model	Tokenised deposits	Deposit tokens	Stablecoins
Description	Central bank money settlement occurs on a central bank-run DLT platform that is interoperable with DLT platforms developed by market participants	Central bank money settlement and securities settlement occurs on a DLT platform shared by central bank and other market participants	On-chain representation of bank accounts, backed by a bank's balance sheet	On-chain representation of a claim on a bank's balance sheet.	Tokens that purpose to maintain a stable value relative to a specified asset (usually fiat money), backed by backing assets.
Advantages for scaling	Imminent availability (e.g. Pontes). Zero credit risk and zero counterparty risk	Zero credit risk and zero counterparty risk. Full atomicity	Low risk; maintain singleness of money. Automation, instantaneous liquidity, and programmability offer key benefits (e.g. payment subject to conditions being met).	Transferability and free circulation; higher compatibility with public blockchains (compared to tokenised deposits)	Bearer instrument
Disadvantages for scaling	No full atomicity.	Cash pools will be fragmented across different asset DLTs	Limited ability to transfer outside of issuing bank, without common (central bank) settlement layer / agent. In addition, banks are not incentivised to hold large amounts of cash in 'nostro' accounts with other banks and bear risks of issuers; hence, more 'neutral' (e.g. Fnality) and consortium-based models may present more viable options.	Perceived lack of legal consistency and commonly agreed definitions. Depending on structure (bearer v non-bearer), market prices may fluctuate from par and redeemability can pose questions, therefore economic fungibility is a key consideration.	Some considerations for additional uptake / adoption in wholesale markets: 1) transferability into fiat currency, 2) development of Euro-stablecoins, 3) depegging risks, 4) pricing (also of interest rate, counterparty and market risk), 5) yield, and 6) access by issuers to central bank money. Stablecoins need regular disclosures on reserve assets.

[10] See GFMA Report Digital Money in Capital Markets (2026) for more detail

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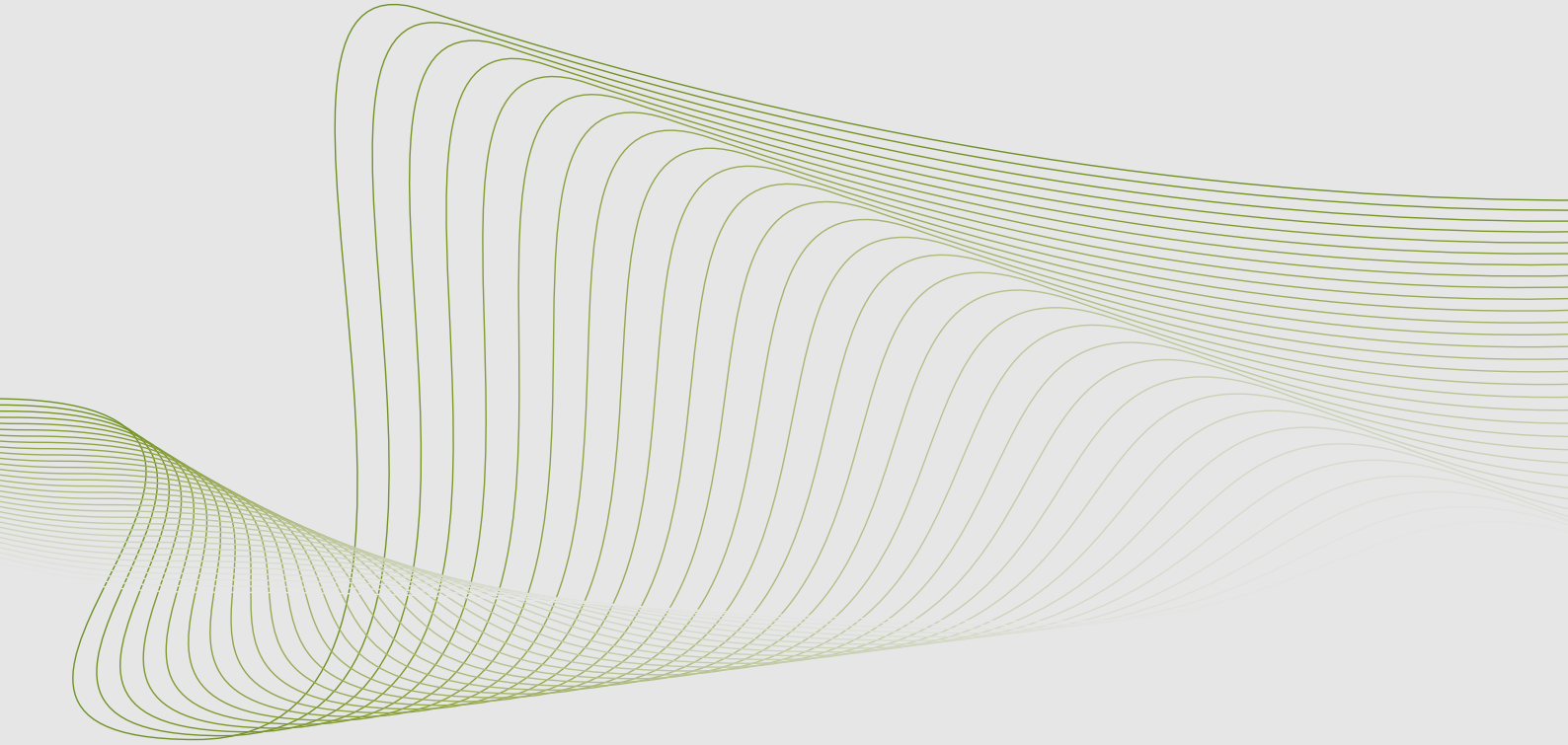

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