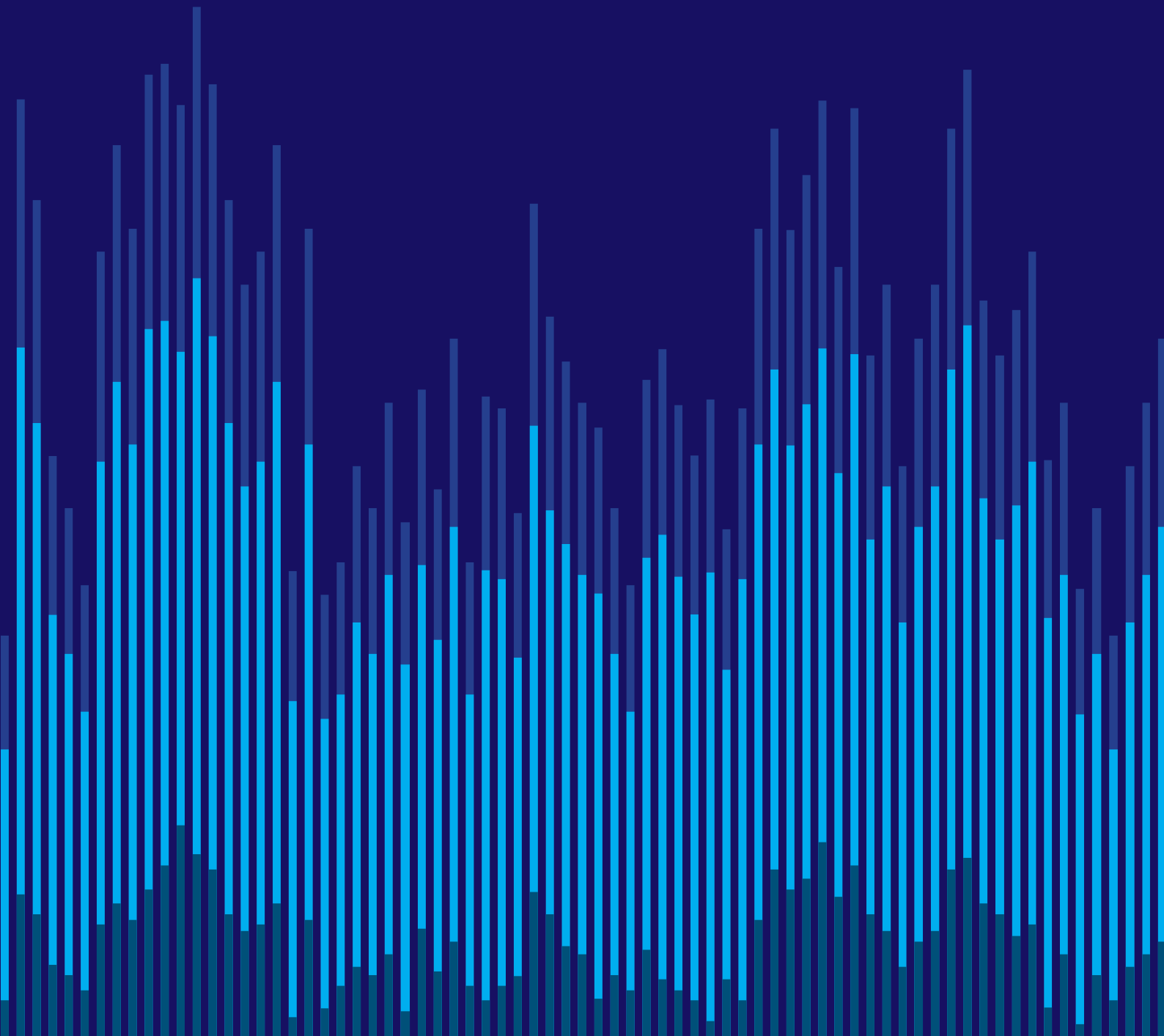
A DISCUSSION WITH MARKET INFRASTRUCTURES AND PARTICIPANTS IN PARIS

Towards European market
and post-market infrastructures
supporting the smooth functioning
of the Savings and Investments Union

BANQUE DE FRANCE
EUROSYSTÈME



This document is the result of an in-depth reflection by the Banque de France following discussions with market infrastructures and participants in Paris held in the third and fourth quarters of 2024, reflecting a wide range of perspectives as well as points of attention relating to their activities. It was drafted by the Banque de France and does not necessarily reflect individual views of the firms consulted. The aim of this report is to identify the areas for improvement to optimise market infrastructures and explore a future vision. It seeks to strengthen the efficiency and integration of the Savings and Investments Union, while preserving the strong resilience that currently characterises the financial system. This approach was adopted in a rapidly evolving international and technological context, where it is crucial to explore and anticipate solutions that will meet the challenges of tomorrow while maintaining the stability and competitiveness of market infrastructures.

This paper benefitted from the contributions of: BNP Paribas, BPCE, Caceis, Crédit Agricole CIB, Euroclear, Euronext, Iznes, Paris Europlace, Société Générale, Swift and Viel & Cie.

Contents

Financial market infrastructures contribute to market stability and the smooth circulation of European savings to ensure the financing of the economy. Keeping these infrastructures at the cutting edge of technology enables progress to be made in the Savings and Investments Union. This ensures the European sovereignty and financial stability in financial markets that is essential in a rapidly changing environment. The M. Draghi report[1] offers the most recent analysis of the need for investment in the European Union (EU) to remain competitive at a global scale, to which the European financial markets and their infrastructures must contribute. This report has created a momentum at European level, and P. Cipollone's speech on a "digital capital markets union" is one of the most prominent outcomes.[2]

Efficient European trading venues and infrastructures are also particularly important for the further expansion of European green finance, which is genuinely transparent and designed to meet the challenges of climate transition.

Improvements to European infrastructures must go hand in hand with enhancing the position of European actors in the financial securities value chain. For this purpose, a strategy needs to be defined to help maintain the euro area's lead in infrastructures.

European market infrastructures have continued to improve and evolve in recent years. In particular TARGET2-Securities (T2S), the Eurosystem's technical platform for securities settlement, has significantly enhanced the efficiency and integration of Europe's financial system. By harmonising settlement processes and centralising operations across participating markets, T2S has reduced cross-border transaction costs, minimised settlement risks, and fostered liquidity. T2S has also paved the way for more efficient collateral management, enhancing access to liquidity for market participants.

However, T2S faces structural and competitive challenges. Furthermore, the rise of new technologies and market demands exposes gaps in its current design. Key areas to address include asset tokenisation, which calls for DLT-based settlement compatibility, the shift towards T+1 settlement cycles, the expansion of fast retail payments to meet consumer expectations, and the need to support innovation financing and sustainable transition projects.

1 The future of European competitiveness: Report by Mario Draghi, September 2024

2 Towards a digital capital markets union (europa.eu), P. Cipollone, October 2024

1. Current state and challenges of European market infrastructures

1.1 Overview

1.1.1 Current market infrastructures

TARGET Services play a pivotal role in financial infrastructures, which guarantee settlement in central bank money (CeBM), with the notable exception of Eurobonds[3] and ETFs, certain OTC products including funds and more recently tokenised asset transactions. CeBM final settlement is mandatory for a large part of market infrastructures, under regulations transposing the CPMI-IOSCO's PFMIs. Target Services infrastructures not only support the circulation of CeBM but also underpin the entire two-tiered system, ensuring that both central and commercial bank money can flow seamlessly across borders and financial institutions.

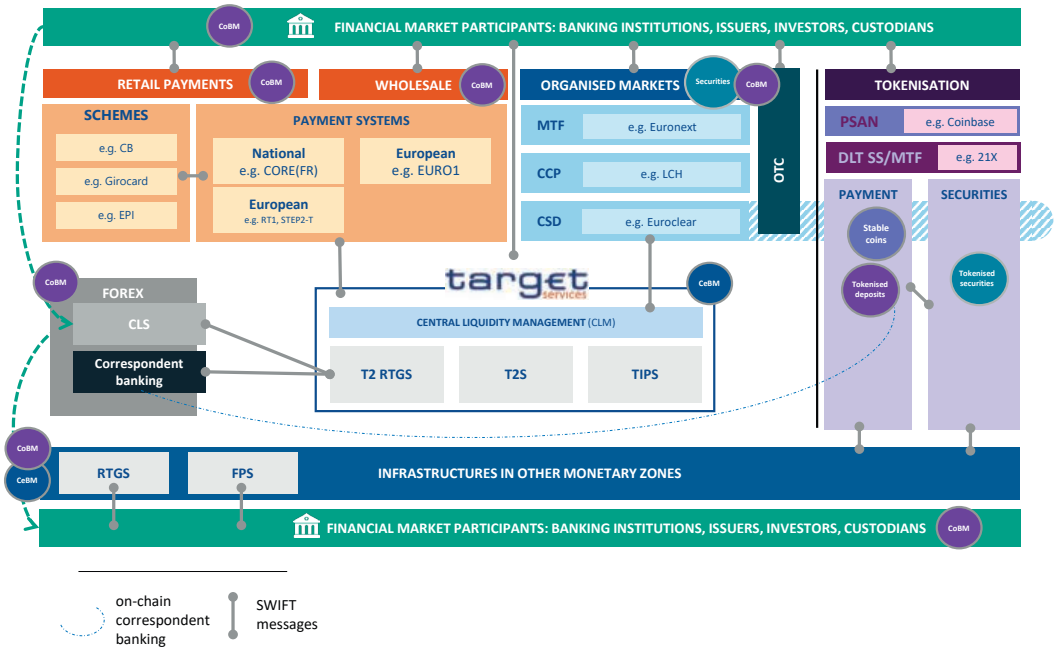


FIGURE 1 – Current overview of financial market infrastructures

3 Bonds with XS ISIN deposited with a common depositary and settling mainly in (I)CSDs in commercial bank money.

1.1.2 Key achievements so far

Significant progress has been made in recent years for integrating market infrastructures. TARGET Services now propose a centralised liquidity management (CLM) module that centralises the monitoring and management of TARGET participants' payment capacity in CeBM and support all central bank operations. T2S has already made it possible to harmonise a large number of settlement features within the euro zone and the market has benefited from T2S advances in terms of standardisation of delivery versus payment (DvP) processes and new services (e.g. partial settlement). The Target Services consolidation brought technical as well as functional enhancements and the future launch of European Collateral Management System (ECMS), enables to continue on harmonising collateral management and the handling of securities transactions.

Regulation has done much to promote harmonisation, with increased transparency and better access to information for investors, facilitated by intermediaries and market infrastructures.[4] This regulatory harmonisation facilitates the consolidation of major European market infrastructures, which delivers tangible benefits (e.g Euronext,[5] Euroclear,[6] etc.) to market participants. This allows the emergence of relatively integrated markets (vertical and cross-border), intermediaries with a broad regional presence, and in the end supports a simplified access to financial assets in the EU. As a result, financial infrastructures are characterised by trading efficiency (i.e the ability to trade with low latency and high liquidity, reducing bid/ask spreads), flow netting, reduced the number of net transactions, reliable registration and transaction processing, while ensuring adequate regulation of the players involved.

1.2 Identified needs and frictions

1.2.1 Structural and competitive issues

The landscape of trading venues and post-trade infrastructures is still fragmented. There are 28 active CSDs in the EU, while for instance settlement is handled by a single operator in the United States (US). In the EU, only Estonia, Lithuania, Cyprus and Ireland do not have "their" national CSD.[7] This multiplicity of actors is somehow mitigated by

4 i.e MIFID, CSDR, EMIR, SFD, SIPS, SHRD, etc.

5 Beyond the successful integration of 7 stock-exchanges (France, The Netherlands, Belgium, Portugal, Ireland, Norway and Italy) on a common technology and single liquidity pool, Euronext is investing to deploy a common platform for all CSDs managed by the group (4 CSDs in Portugal, Italy, Denmark and Norway), enabling market participants to benefit from a harmonised service on various European markets representing around 7,000 billion in assets (equities & ETFs, bonds, structured products, fund units). Having designated Euronext Clearing as its CCP by default, Euronext relies on T2S for all cross-border settlement.

6 The integration of the three Euroclear ESES platforms (France, the Netherlands and Belgium representing EUR 11 Trillion of AUC) on a single operational and technological platform is an illustration of current efficiency. Three separate legal entities co-exist, each operating a single Securities settlement system (SSS) under local property and title law, supervised by the regulators of the country in which the SSS is domiciled. The ESES platform's links with the main European domestic markets and, above all, with the iCSDs, provide direct access to international investors, enabling international distribution of Euroclear's domestic issuers' issues.

7 Estonia, Lithuania and Cyprus are part of the Nasdaq CSDs headquartered in Estonia with three local branches (covering Iceland not part of the EU). The branches have their own SSS that operates under local securities law. Ireland is the only country that does not have their own SSS operating their local securities law. Irish securities operate under Belgian law as issued in the Belgian SSS of Euroclear Bank.

the consolidation movements carried out in recent years by European groups (cf. supra). Several CSDs, particularly in the Member States with the largest volumes, are part of pan-European corporate groups. The three largest groups represent 96% of European CSDs' settlement activity and 93% of assets under custody.[8] Nevertheless, capital integration and operational integration remain distinct streams.

This European complexity in the value chain of financial securities leads to an increased cost of cross-border operations due to the necessity to secure access to multiple CSDs and the CSDs' preference to maintain CSDs links. The mobilisation of a multiplicity of actors and the establishment of links between them (122 one-way or two-way links exist between European CSDs) might generate potential high costs which might be passed on to transaction costs.[9] There is also a variability of costs due to the multiplicity of actors.

1.2.2 Market and post-market frictions

The current landscape is effective for liquid assets, but not for illiquid assets and cross-border transactions in Europe due to the fragmentation of the post-trade. The launch of T2S has been a real step forward in the harmonisation of the post-trade market in Europe, providing a single, simplified access to central bank services, collateral management and cross-border transactions. However, there are still opportunities to take this movement further. In terms of both volume and value, cross-border transactions in T2S[10] represent a minority of flows, above 4% of volumes and 4% of amounts in 2023. A very large proportion of settlement, whether cross-border or not, is carried out within custodian networks (including international (I)CSDs) that have long standing and efficient network arrangements, allowing for international settlement within and outside T2S. Some trading models (e.g payment for order flow, systematic internalisation, etc.) largely bypass trading and clearing infrastructures. Vertical integration, whether partial or total, can take place without technological disruption if the largest players, with a large number of clients, are able to execute and settle transactions internally, without going through all or part of the "open" infrastructures.

The multiplicity of actors creates a need for many reconciliations especially for multi-listed securities. For example, ETFs start issuing in one market, their home market where they appoint an issuer CSD. To reach investors across Europe, ETFs issuers cross-list

8 Wright, W. and Hamre, E.F. (2021), "The problem with European stock markets", New Financial LLP, March. See also Euroclear (2024), "Unlocking scale and competitiveness in Europe's markets – Enablers for an integrated and digitised post-trade architecture".

9 Bazot, G. (2018), "Financial Consumption and the Cost of Finance: Measuring Financial Efficiency in Europe (1950-2007)", *Journal of the European Economic Association*, Vol. 16, Issue 1, pp. 123-160, February; See also Philippon, T. (2015), "Has the US Finance Industry Become Less Efficient? On the Theory and Measurement of Financial Intermediation", *American Economic Review*, Vol. 105, No 4, pp. 1408-1438, April.

10 In 2023 the daily average volume of cross-CSD settlement transactions represented 1.61% of total T2S settlement volume (1.25% in 2022), while the daily average value of cross-CSD settlement transactions represented 3.45% of total T2S settlement value (3.63% in 2022). The drop in intra-CSD value observed in December 2023 was mirrored by an increase in cross-CSD value, where the share reached 4.01%, for the reason outlined above (see https://www.ecb.europa.eu/press/payments-news/ecb.t2sar2023.en.html).

on multiple exchanges. ETFs are neither fungible at the trading level (i.e no single-order book for ETFs when there is cross-listing), nor at the settlement level, leading to realignments to transfer shares from the seller's CSD to the buyer's CSD. These realignments represent a sticking point for the transition of ETFs to T+1, including with the UK and Switzerland. Besides, differences in settlement cycles also lead to increased costs - and long-term, lower profitability ratios - for multi-listed assets like ETFs.

Despite the partial harmonisation reached within the EU, national legal frameworks continue to diverge on fundamental points such as the law governing financial securities and the corresponding tax regime. Indeed, the EU has no delegated competence on Member States' civil law. Market consolidation has been achieved through vertical or horizontal integration strategies, with certain groups centralising multiple markets or segments of the securities processing chain. However, the groups cannot reap the whole benefits of their consolidation as they need to operate different SSSs on different IT platforms due to the frictions identified in national laws related to securities, as well as divergent accounting and tax frameworks. In these areas, a careful and precise analysis would have to be run to assess why such differences occur, as a poorly-conducted effort to harmonise some of these gaps could lead to unintended and severe consequences for investors' protection and financial stability. Besides, financial market practices in Europe have largely converged over the past 20 years, but there are still local market practices, for example, in the treatment of corporate actions.

1.2.3 Asset management transparency and operational efficiency

The issue of transparency with regard to the identification of security holders has still not been fully addressed, with harmonised and complete regulations for equities but only partial regulations for funds and bonds. Extending the Shareholder Rights Directive to cover bonds and funds, based on the French model, would enhance transparency across all financial instruments, aligning with the level already achieved for equities. Although the role of bond holders is massively different from the role of shareholders in the governance of companies, this might promote greater investor engagement and accountability at the European level. This would be of real benefit to fund managers, which currently have imperfect knowledge of the investors in their funds. This would also benefit financial stability purposes from the authorities' perspective to better delineate interdependencies in the financial markets.

Most of the funds distribution in Europe is operated outside of infrastructures through the "Transfer Agent" (TA) model, the French market being one of the exceptions with its French CSD distribution model. In some situations, the distribution chains to investors are unnecessarily long. Whatever type of information circulates along this chain (e.g orders, fund valuations, corporate actions, etc.), there is no guarantee that it will be passed on to the final holder. For the funds' distribution abroad, the use of local centralising agent adds another layer of complexity. There is therefore considerable room for improvement in this area.

Developing registered shares[11] could simplify the distribution chain, benefit investors in terms of fund repository quality, avoid the reconciliation of tracking fees, and improve cut-off times. Private equity funds, mainly invested in real assets, with their complex commitment and call processes, would particularly benefit from this simplification, thereby improving the transparency and efficiency of fund management.

1.2.4 Financial markets accessibility

Another key issue is the difficulty for small and mid-cap companies in gaining access to financial markets. The access is costly for mid-cap companies - and even more so for SMEs - due to regulatory investor protection requirements, and lower liquidity. One approach might be to have a platform enabling lower cost access to financial market infrastructures (FMIs),[12] and possibly considering automated aggregation of SMEs securities in vehicles. Extending access to market infrastructures might be considered in its operational and regulatory dimensions. On the other hand, liquidity might be difficult to build from scratch and in terms of business model, the limited potential of this market makes the greenfield investment difficult to justify.

1.2.5 Need to anticipate the consequences of instant payments development from the retail sphere to the wholesale sphere

The recurring demand for extended market hours and 24/7 availability of infrastructures driven by technological advancements and evolving financial practices, highlights the need for more flexible liquidity management and access for new participants. Users increasingly call for uninterrupted functionality, eliminating traditional cut-off times and shifting towards real-time settlement, which may impact liquidity reserves.

Today, there seems to be a low but genuine interest in corporate cash transactions, particularly given that the euro is a global currency and cash pooling can sometimes be relevant intraday. In contrast, the demand for instantaneity in the segment of financial instruments and settlement appears less relevant, with no strong demand from clients to settle and deliver securities outside the operating hours.

However, looking ahead from a dynamic future perspective, the analysis suggests that the development of instant payments in the retail sphere will exert economic pressure on financial institutions. Commercial firms, in particular, will face increased liquidity volatility during seasonal consumption peaks (e.g. during events such as "Black Friday"). This pressure from retail payments will impact the real-time liquidity needs of corporate treasurers and ultimately, financial institutions, requiring efficient intraday cash management during these peaks, implying as well adapted (i.e. intraday) treasury

11 Registered shares are linked to the owner's identity. Bearer shares, on the other hand, are owned by whoever holds the share certificates, allowing anonymous transfer.

12 E.g.: in a recent report, E. Letta calls for "an EU Deep Tech Stock Exchange thanks to specific rules and supervision". https://www.consilium.europa.eu/media/ny3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf

management practices and tools. As the role of banks and treasurers evolves to manage liquidity in real time, the need for immediate settlement of financial transactions is likely to grow across the industry.[13]

1.3 Technological trends and challenges: responding to the development of new practices

The disruptive changes in the ecosystem are not necessarily linked to distributed ledger technologies (DLTs) developments (see supra). Nevertheless, **the development of DLTs and tokenisation in general for financial transactions have the potential to significantly impact and reshape the structure of the financial sector**, bringing a wave of new actors at the crossroads of IT and finance, as well as new exchange and settlement infrastructures. In principle, tokenised assets are conceived as having the same content as their conventional equivalent. However, their different format brings benefits in terms of circulation and the possibility of using these assets as complementary information vectors. This is therefore a technological innovation that could have a major impact on market practices.[14] The Financial Stability Board (FSB) considers that potential relative gains of tokenisation depend on the scale of adoption across financial markets and asset classes. Some asset classes that stand to gain the most are also the more challenging to tokenise (e.g. less standardised assets such as securitised products and private equity).[15] These asset classes require frequent, manual processes and entail complexity, including legal requirements and multiple layers of intermediation.

Currently, we are in a non-disruptive scenario: tokenisation and crypto-assets expand as adjuncts to the existing ecosystem. While the industry has shown interest in tokenisation, the level of demand from investors and other market participants for these products remains uncertain, one of the key factors of success being the provision of settlement in central bank money. Innovative entrants integrate into the legacy organisation by offering a complementary range of services that covers previously uncovered or underserved market segments. These services remain limited to certain specific and marginal use cases, considering the maturity of the financial market infrastructures. New tokenised private settlement assets, including crypto-assets, are currently the available settlement assets to settle tokenised transactions.

This poses the risk of a disruptive evolution of the ecosystem, with consequent challenges to financial stability and monetary sovereignty. A disruptive scenario could potentially emerge in the future, where incumbent financial institutions recalibrate their business models to further internalise post-trade processing — leveraging new

13 In France, brokers and banks "simulate" immediate settlement for their retail clients, by giving immediate benefit of the cash linked to the sale of securities (and debiting immediately the cash required for buying transactions). Extending this practice in other Member States might answer the demand for immediacy from retail clients, subject to a risk analysis.

14 According to some estimates, automation and smart contracts could reduce annual infrastructure operational costs by approximately USD 15-20 billion in global capital markets. See: Global Financial Markets Association (2023), *Impact of Distributed Ledger Technology in Global Capital Markets*, 17 May.

15 Financial Stability Board (2024), "The Financial Stability Implications of Tokenisation"

technologies such as DLT. In such a scenario, the ecosystem could be profoundly altered by the adoption and proliferation of new technologies like DLT. This shift would build on the growing internalisation of trading activities, as seen in equity markets, allowing firms to achieve economies of scale and bypass legacy systems. However, the likelihood of such a scenario remains uncertain. This would imply the development of stablecoins or tokenised deposits as settlement assets. While innovative, these private settlement assets lack the inherent security and reliability of central bank money, thereby potentially undermining the substantial progress made over the past 15 years in enhancing financial stability.

Consequently, in the absence of wholesale tokenised central bank money, a few large private entities – particularly major non-EU financial institutions – might increasingly dominate the market. These players might exploit their proprietary networks to establish a commanding position in the market, dictating the rules and imposing high entry barriers. This growing concentration of power would allow them to lead and shape the future of market infrastructures, side-lining existing European initiatives. As a result, European infrastructures including Target Services might be relegated to a secondary, almost satellite role, and the settlement in CeBM might be marginalised, resulting in risks for financial stability, and weakened European independence in terms of financial services necessary to fund the real economy and the twin transitions. The transition might lead to a fragmented financial landscape and introduce systemic risks that could potentially compromise financial stability.

These challenges explain the growing demand from financial intermediaries for the issuance of a wholesale tokenised central money. This demand is reflected in the numerous projects that have been successfully completed or are currently underway across the globe. In particular, the Eurosystem has successfully concluded a series of tests employing DLT for wholesale settlement in central bank money. Between May and November 2024, the Eurosystem processed over 200 transactions and a total value of €1.59 billion. In total, 64 participants comprising central banks, financial market participants and DLT operators completed over 40 experiments.[16] These initiatives highlight the readiness of the financial sector to adopt tokenised CeBM, which would provide a secure and efficient settlement asset directly backed by central banks.

Evolution without disruption scenario	Disruptive changes to the ecosystem scenario
Tokenisation and crypto-assets are developing to complement the existing ecosystem without altering it	Business models are changing to internalise post-trade processing
Competitive environment (particularly internationally) remains unchanged	Dominance of large private entities, particularly non-European financial institutions
Emerging risks (e.g. quantum) do not cause upheaval in the ecosystem	Greater financial fragmentation
The two-tier monetary system remains the central architecture	Emerging risks becoming a reality / upheaval in the financial instruments processing chain

FIGURE 2 – Scenarios for integrating new technologies into the infrastructure landscape

16 See: Eurosystem completes tests using DLT for central bank money settlement, ECB website

2. Vision for future market infrastructures landscape

There is no single future for the financial market infrastructures, but rather a combination of potential developments and improvements that can be partly achieved by leveraging both existing public and private systems and ecosystems to enhance the performance of the existing infrastructures, extend their reach and meet the new needs of market participants.

2.1 Enhancing integration and efficiency

Further progress in harmonisation is still needed, including on the regulatory front. While much has already been achieved in this area, there remains significant room for improvement, especially in terms of taxation processes, accounting standards, and securities law. Currently, pan-European actors cannot deliver all the synergies that are operationally possible.[17] There is a strong consensus that European and national regulators should aim to harmonise regulatory frameworks across Member States to facilitate smoother cross-border operations, and proposals have been made to reduce fragmentation by increasing harmonised supervision and enable to treat pan-European FMIs as a group, that should be supported. Considering that these harmonisation issues are extensively dealt with already, this paper focuses on other complementary operational facets.

2.1.1 Leveraging and improving the existing: optimising pan-European platforms

The current financial market infrastructures in the EU or in the rest of the world appear insufficiently equipped to meet simultaneously several objectives

- **24/7 functionality for wholesale payments** without interruption and therefore without cut-off time, replacing the notion of value date by that of minute (or second) of value;

- **The need to maximise cash pooling and liquidity savings device** at the global level for the larger actors, in a context where excess liquidity should reduce along with the normalisation of the monetary policy normalisation around the globe.

17 E.g CSDR is a harmonised regulatory framework but supervisors implement it differently country by country, and in some case add local requirements.

If shorter settlement delay from T+2 to T+1 can be implemented within the current operational framework, as demonstrated by the recent migration to T+1 in North America markets,[18] there is a strong consensus that any further reduction to T+0, and particularly instant/atomic settlement imply a full reshuffle of the operational design of settlement, requiring a major technological change. For example, one of the biggest benefits of current settlement models (including same-day) is the possibility to net transactions, which reduces liquidity and collateral needs and exposures. Transition to instant/atomic settlement should then be carefully assessed in the cost-benefit analysis, whereas netting is currently providing efficiency advantages on liquid markets.[19]

In terms of transparency, likewise, the facilities currently available offer only limited and partial response to the need to have a complete vision of the securities holding chain. This is not addressed for instance by the European Single Access Point (ESAP) project, whose objective is different, and that aims to simplify access to both financial and non-financial information for entities across the EU. ESAP enhances transparency by providing a centralised platform where companies' disclosures can be accessed by investors and the public, but conversely gives no visibility to corporates and asset managers on the final holder of the financial instrument issued. This transparency might be achieved on existing systems, but depends on the industry's willingness to implement the means to achieve end-to-end transparency (e.g. Unique Transaction Identifier for securities settlement). In any case, this information is still imperfectly disseminated throughout the chain.

Future infrastructures may require continuous enhancements to support the objectives of the Savings and Investments Union. To address market fragmentation and enhance post-trade efficiency, one promising avenue could be a platform integrating natively functionalities meeting 24/7 and transparency requirements. This would rely on tokenised commercial and central bank money (the latter playing its anchoring role, maintaining the resilience of our current monetary system while leveraging new technologies), as well as tokenised financial instruments.

18 Keeping in mind that the comparison between EU and North America post-trading markets is limited by some structural differences, since North American jurisdictions each have a unified post-trade infrastructure, do not enforce a settlement discipline regime that include penalties, etc.

19 There are numerous technical options available to ensure the pooling of liquidity between the conventional and tokenised versions of a given asset. These solutions leverage advanced interoperability frameworks and bridge mechanisms to seamlessly link traditional financial systems with tokenised platforms. These approaches ensure that market participants benefit from the efficiencies of tokenisation while maintaining access to the broader liquidity of conventional financial markets.

2.2 Building a resilient and sustainable financial ecosystem

2.2.1 A regulatory context for technological innovations

A strategy could be to build upon the European Pilot Regime to integrate these technologies into the financial ecosystem. The tokenisation of finance is attracting growing interest from the financial sector and its stakeholders, and introduces possibilities unforeseen in the current traditional set-up. The European co-legislators have taken up this issue with the recent adoption of the European Pilot Regime for DLT-based market infrastructures. Regrettably, ESMA recently reported that this regime is off to a rocky start and no DLT market infrastructures have been authorised yet. ESMA identified some challenges and asked the European Commission for clarifications to support the increased uptake of the regime. The obstacles identified include the absence of central bank digital currencies for cash settlement and a liquid secondary market, challenges with custody through self-hosted wallets, interoperability issues between DLTs and traditional financial infrastructures, investor protection concerns, limitations in volume and value for DLT-based financial instruments, and uncertainties regarding the duration of the Pilot Regime. The limited interest in the Regime can also be attributed to the fact that each actor appears to prefer maintaining their specialised roles within the existing framework (e.g. banks show no inclination to become settlement system provider). The European Commission has already clarified that there will be no expiration date for the European Pilot Regime

Finally, it is necessary to address the risks posed by the proliferation of market DLTs leading to potential fragmentation in asset custody and issuance as well as liquidity fragmentation. Proprietary ledgers and proprietary systems lacking harmonisation and standardisation and diverging regulatory requirements and market practices across different jurisdictions or market segments result in fragmentation along national borders or along infrastructure silos, creating and maintaining islands and non-interoperable mini-ecosystems.

2.2.2 Facilitating access to market finance and supporting green finance

DLTs might efficiently address key challenges of financial market infrastructures by offering significant improvements in data processing and cross-border transactions. First, DLT enhances data accuracy, reducing the need for intermediaries and streamlining processes. This ensures better data integrity and transparency in transactions. Second, this technology can operate in real-time and allows for continuous, 24/7 availability, eliminating settlement delays and enabling instant finality of transactions. This contrasts with traditional systems that rely on fixed operational hours and often experience latency. Moreover, DLT is particularly effective in cross-border operations: its decentralised nature helps overcome geographic and institutional silos, fostering interoperability and a more unified global financial infrastructure. These capabilities make DLT a powerful solution to the inefficiencies faced by modern financial systems.

This would be particularly useful for commercial paper since automation and digitalisation can streamline issuance, verification, and compliance processes, reducing manual errors and delays. Real-time reporting, and DLTs can enhance transparency, security, and cash flow management. Overall, these improvements lead to faster, more efficient processing while ensuring better risk management and cost savings.

Transparency in market infrastructures is particularly necessary in environmental, social, and governance (ESG) finance, whose development is hampered by the need for access to reliable, rapid, transparent, affordable and standardised information. There is now a regulation on corporate sustainability reporting (i.e. CSRD), which aims to enhance transparency and accountability by requiring companies to disclose their ESG impacts. The focus now shifts to implementing these requirements effectively, enabling stakeholders to make informed decisions regarding sustainability practices and performance. The risk is that pioneering private initiatives, notably those linked to the development of green finance, will not find relevant public support and adequate infrastructures in the EU and will thus seek it outside, taking up among non-EU financial actors and authorities, eventually meeting large market demand, the European actors being marginalised. Investors have an interest in being able to track and visualise the impact of their investments on the real economy and therefore also on the climate transition. An end-to-end traceability mechanism between the use of the funds (indicators reported by the projects using the funds) and the end investor could enable investments to be better targeted.

3. From vision to action: objectives and path towards future-proof European market infrastructures

3.1 Key considerations: enabling European infrastructures to meet new demands

This part proposes to define the major objectives that European market infrastructures should seek to achieve. These include gradually moving towards instantaneous payments and financial transactions, simplifying cross-border and straight-through processing management, and enhancing the flow of data to issuers.

3.1.1 Adapting infrastructures to the new relationship with time, including new services

While current demand for instantaneity is low, and an extension of market infrastructure operating hours to a 24/7 model does not in itself constitute a substantial need nor a solution to market fragmentation, **the rise of instant payments in the retail sector is expected to place economic pressure on financial institutions, increasing the need for real-time liquidity and treasury management, exerting the need for intraday financial instruments settled in an instant mode.** In this perspective a shared DLT-based platform could be designed to operate with extended hours from the outset, with the possibility of gradually extending hours to adapt to market needs. Other areas of improvement identified regarding the optimisation and acceleration of settlement in the EU and also relevant in the context of the contemplated transition to T+1 notably relate to the lack of a shared/ common ledger to handle Standard Settlement Instructions (SSIs), or of an EU platform for allocation / confirmation.

KEY CONSIDERATION 1:

European markets should take up the issue of speeding up settlement. The move towards instantaneity from the retail payments sphere towards suppliers and corporates in general has an impact on intraday cash management and calls for appropriate financial instruments on the money market, as well as the ability to settle transactions instantly. New infrastructure projects with instant settlement for certain asset classes (e.g. funds, commercial paper) could provide an opportunity to carry out a cost-benefit analysis for market participants. Optimisation of settlement could be further enhanced with additional services on a shared / common ledger including SSIs and allocation / confirmation services, also identified as key enablers in the context of a move to T+1.

3.1.2 Enriching the services provided vis-à-vis collateral management and corporate actions

To further support this move towards instantaneity, collateral management services operated in DLT could facilitate a faster mobilisation of collateral to cover cash or securities needs to support atomic settlement in a 24/7 environment. First European experimentations on fixed income assets (repo, margin calls, securities lending…) have already showcased all the potential benefits of the DLT in terms of faster mobility, deeper liquidity and better operational efficiency. In addition, digital exchanges of collateral show promise in orchestrating collateral flows which are too complex for current infrastructure, delivering risk reduction and further efficiency gains. A virtuous cycle could be expected from atomic settlement allowing faster and larger mobilisation of collateral, which in its turn would ease atomic/instant settlement.

In the same vein, corporate actions processes are currently processed with proprietary systems, and thus not mutualised through financial market infrastructures. A common utility serving the value chain with regards to the processes of corporate actions could contribute to lowering the costs and thus facilitate access to market funding for a larger community.

KEY CONSIDERATION 2:

European markets should consider providing a common DLT-based facility servicing collateral management and corporate actions in order to enhance processes, in terms of risk reduction, efficiency and cost reduction.

3.1.3 Simplifying cross-border and straight-through processing management and supporting the emergence of a new market for small and mid-caps

Clients want to be able to manage their entire portfolios, including cross-border portfolios, from a single point of interaction: this implies that financial market infrastructures should serve market participants with the objectives to (i) deliver cash as quickly as possible, (ii) facilitate the monitoring of coupon and interest calculations that reduce operational costs (particularly reconciliation) and (iii) in a context of high security (i.e. not being subject to settlement/delivery risk in both primary and secondary markets).

KEY CONSIDERATION 3:

A European shared DLT-based platform should natively incorporate interoperability with both European and non-European FMIs, in order to facilitate the capacity of the market to manage both cash and securities positions on a cross-border and integrated basis. Particular attention should be given to multi-listed assets as financial players should not face discrepancies in their processes (e.g. corporate actions on multi-listed financial instruments).

Besides, financial markets in their current organisation do not allow for an efficient treatment of small and mid-caps. European savings tend to be underinvested in equity. This is especially detrimental to the small and mid-cap segment. This phenomenon is certainly multi-causal (multiple securities laws; lack of coverage of this investment universe by analysts; lack of accessible and reliable data, etc.), but simpler and streamlined financial market infrastructures can certainly contribute to the development of this market segment. A project for a shared ledger allowing European MTFs to list all the European stocks in this compartment, to improve visibility compared to the US, and to converge towards a post-trade chain that is as unified and homogenous as possible, might be a way forward, along with Member States reforms to address the European liquidity issue.

KEY CONSIDERATION 4:

The hurdles for small and mid-caps to access financial markets might in part stem from the fragmentation of infrastructures, which increases operational costs (partly supported by investors) and reduces the size of the liquidity pool. A solution could be the development of a more integrated pan-European platform, reducing costs and streamlining operations for small and mid-sized companies. Tokenisation could further enhance operational efficiency.

3.1.4 Expanding the service offerings of infrastructures to improve asset traceability

Financial infrastructures need to expand their services beyond trading, custody and settlement to also serve as effective vehicle for transferring both financial and non-financial information. In this respect, the concept of securities traceability could offer a new type of service to be considered. This would address a series of important financial processes: the capacity to enable information on the position of securities in the processing chain, the identification of asset holders. This would meet some needs expressed notably by the fund management industry in terms of an asset and liability management perspective and address financial stability concerns, in terms of a better identification of financial interconnections and interdependencies.

In addition, from an operational perspective, the goal is to enable issuers and investors to monitor their positions more effectively, enhancing simplification and transparency, which can help minimise failures and reduce friction in settlement and delivery. In France in particular, fully registered shares (directly managed by issuers) currently fall outside the straight-through processing infrastructure. These concerns gain in importance as the development of green finance emphasises the need to connect myriads of environmental data, with securities linked to ESG performance. This would be a major advantage for investors who have to do reporting, as it would enable them to acquire information directly, without going through providers in an oligopolistic situation. Additionally, the reporting data generated would be rich and valuable for regulators, providing them with deeper insights into market activities and enhancing their oversight capabilities.

The fact remains that the information thus compiled and standardised will not necessarily have to be disseminated to the entire ecosystem. For example, not all market participants want their holdings to be known, which is why the legislator has introduced mandatory disclosure thresholds. Care must be taken to ensure that increased transparency does not change the market structure.

KEY CONSIDERATION 5:

Financial market infrastructures should enable the circulation of relevant information and data accompanying assets. DLT could contribute to this smoothness and standardisation of information with common technical standards to simplify processing. Smart contracts can be used to encode a great deal of information about a security.

3.2 Key takeaways: allow European financial actors to converge and grow within Europe

The description of these developments clearly shows that the world of market infrastructures is constantly evolving. Technological innovation is only one of the driving forces, and the concentration of players did not wait for the emergence of DLT in Europe. However, DLT technology can be the opportunity to accelerate the structural changes underway and enable rapid improvements to Europe's market infrastructures. According to P. Cipollone, if we seize this opportunity, "*the benefits of this new approach could reach far beyond tackling technological inefficiencies, eventually resulting in a move away from the centuries-old structure of intermediation to a unified, distributed ledger or a constellation of fully interoperable ledgers. This transition could help us deal with the current fragmentation of financial infrastructures, reduce barriers to entry and serve as a driver of capital market integration in Europe*". Then, to achieve the objectives described above, it is important that European financial players join forces with their public partners and market utilities (e.g. Swift) to design a common infrastructure.

To take full advantage of the opportunities of standardisation and interoperability that DLT offers, this could take the form of a shared ledger to which all financial players would connect, similar to T2S. The Banque de France has already demonstrated the added value of DLTs in experiments such as Jura project with SNB and BISIH as well as private partners, deploying wholesale CBDC on a DLT platform being multi assets and multi jurisdictions. Some experiments involved major French financial actors such as Euroclear and AFT[20] in a replication on DLT of the vast majority of T2S features, including settlement optimisation, repos, and auto collateralisation. Conceptually, this shared ledger could bring together listing, clearing and settlement activities, bringing together all assets within a transparent, efficient and easily accessible ecosystem.

20 settlement-french-government bonds-in-cbdc-with-blockchain.pdf (euroclear.com)

The development of a common infrastructure as a 'tool-based' approach should be preferred over a 'player-based' approach. The coexistence of multiple CSDs in Europe should not be viewed as an insurmountable obstacle that undermines the importance of developing common standards and a unified infrastructure to enhance the practical functioning of the post-trade environment. From the perspective of issuers or investors, what matters most, in addition to safety and certainty, is the need for streamlined, harmonised and standardised processes. Some operational improvements can be achieved through the sharing of a unified infrastructure, as illustrated by the ambitious T2S project, without forcing the consolidation of the various operators in the industry. The launch of such a platform is not in conflict with the logic of convergence between the different actors, and could even simplify the process by bringing them into closer partnership.

The rationale behind the creation of T2S offers a valuable pathway that should also be pursued in the ongoing efforts to deepen harmonisation. As the pursuit of a sector-wide consolidation remains the initiative of the sole private sphere, a valuable, non-exclusive and more immediately implementable option would be to strengthen collaboration and establish a common infrastructure for financial actors. This approach would enable them to operate independently while enhancing the efficiency of the overall system. Similar to T2S conception, a common infrastructure would allow all European actors to interact with each other so that each one could serve as an entry point to the entire market. It is also important to limit local market practices, and to accompany the development of the ecosystem from the start rather than standardise and harmonise practices *ex post* as is the case today.

This common infrastructure shall not aim to fully replace current infrastructures in the short to medium term (including TARGET Services). Initially it is designed to complement current wholesale markets on specific tokenised segments. If, in the long term, it would turn out that the functioning of "legacy" market infrastructures can be realised in a safe and stable manner through this common ledger, the natural course of action would be that existing infrastructures would eventually be moved to the DLT-based ecosystem. This would mean that this common ledger would in effect become the next generation of TARGET Services (incl. T2S). However, cautious consideration would have to be given to the specifics of this common infrastructure, including the scope of services, governance structure, operational procedures and the potential implications for existing infrastructure and assets.

KEY TAKEAWAY 1:

A "tool-based" approach should be preferred over a "player-based" one, highlighting the need for standardised methods and interoperability between systems. Significant operational improvements can be achieved through shared infrastructure. The European financial centre should leverage the success of the T2S platform to develop a shared infrastructure that allows all operators to conduct their activities in a standardised, integrated and natively interoperable manner. This common infrastructure would facilitate economies of scale and effectively address the silo effects present in cross-border markets.

It is crucial that such a platform is designed to be open to third-party contributions and foster collaboration. A closed infrastructure could hinder innovation, while cooperation among market players will allow for improvements tailored to user needs. Therefore, a promising concept could be a global European ledger, that is designed from the outset to interconnect with other currency areas.

This platform could be built using both existing TARGET Services and innovative projects led by the Eurosystem. Throughout the exploratory works, which experimented a wholesale CBDC among other solutions, the Eurosystem has actively engaged with private sector stakeholders, witnessing massive interest and market participation in the central banks' initiative. A total value of €532 million has been successfully settled in more than 50 transactions involving 15 different financial firms and central banks since May 2024. In total, 60 financial firms from 9 Euro area countries and four central banks are participating in the Eurosystem's exploratory work. This collaborative approach has not only fostered a robust dialogue but has also ensured that the market needs are woven into the solutions developed, ensuring that they are finely attuned to the real-world demands of the financial ecosystem.

KEY TAKEAWAY 2:

This infrastructure could leverage the success of the Eurosystem's exploratory work on tokenisation, which involved private actors in a "learning by doing" approach. Its development should be grounded in a collaborative framework that engages both public and private stakeholders.

Moreover, the growing demand for secure settlement assets on distributed ledger technology (DLT) underscores the importance of exploring the potential of wholesale central bank digital currencies (CBDCs). As digital currencies issued directly by central banks, wholesale CBDCs could act as a vital complement to existing payment systems, filling the gap left by the absence of tokenised central bank money in the current landscape. Tokenised finance today operates without the foundational security that CeBM provides, limiting its ability to achieve full potential. By introducing tokenised CeBM, central banks could offer a trusted and stable framework for DLT-based financial operations, enabling these new technologies to evolve within a secure and resilient ecosystem.

Without a tokenised CeBM, the financial system risks losing its coherence and stability, sending uncertain signals to the market while compromising the integrity of the established two-tier banking system. This absence creates vulnerabilities, particularly concerning the sovereignty of payments and the euro's critical role in global finance. A failure to address this gap could lead to fragmentation, as private alternatives dominate the settlement space, further challenging the euro's central position. By providing a secure and reliable settlement solution, tokenised CeBM would act as a "security linchpin," reinforcing the financial system's structure and ensuring the seamless integration of tokenised finance within the broader monetary framework.

KEY TAKEAWAY 3:

The provision of a tokenised wholesale CeBM as settlement solution would strengthen the financial system and reinforce the euro's role, unlocking the potential of tokenised finance and promoting greater trust in these emerging technologies.

Last but not least, financial stability shall be at the core of innovation processes. According to the FSB,[21] financial stability vulnerabilities relate to liquidity and maturity mismatch; leverage; asset price and quality; interconnectedness; and operational fragilities. These vulnerabilities relate to three factors: the underlying "reference asset" that has been tokenised; the participants; and new technology as well as its interactions with legacy systems. FSB considers that "*taken together, these factors may amplify many of the same vulnerabilities that exist in traditional finance*".

DLTs are with no doubt a powerful tool on the road to instant processing, but the safety of this innovation (e.g. the inviolability of the DLT) should not be taken for granted. Given the decentralised nature of some DLTs, various cyber threats have been observed during the last months and years. Decentralisation creates multiple points of access to the infrastructure and there is no long-term experience of operating DLTs in the financial sector. A cyber-attack on a critical market infrastructure or ledger could not only entail significant monetary and reputational damage, but also lead to widespread disruption in the financial system and ultimately inflict significant societal costs.

Therefore, an in-depth analysis is needed to understand how such risks could be mitigated for the financial sector. Safeguarding the integrity and confidentiality of data requires multiple layers of security such as encryption, authentication, access controls, monitoring and regular security audits. Nonetheless, this risk seems specific to some DLT models that will probably not be implemented in a public-private infrastructure such as a European shared ledger. In any cases, to address this risk, a step-by-step incremental approach of collaboration between the public and private sector seems warranted.

Other risks shall be monitored when this kind of (relatively) nascent technology is used, in particular when applied by financial institutions to wholesale settlement: governance and compliance risks; privacy; throughput and scalability depending on the consensus algorithms used to validate transactions and update the ledger. Limited scalability and inefficiency of some DLTs is greatly attributable to the need to establish consensus across a large number of anonymous nodes. By contrast, in a wholesale settlement context where a DLT would be shared across financial stakeholders, scalability could be higher.[22]

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21 FSB (2024), see supra

22 On this last point, see for instance the Spunta DLT shared across the Italian Banking Community, which processes around 200 million live transactions per year. See also: Payment systems: liquidity saving mechanisms in a distributed ledger environment – Stella project report (europa.eu)

KEY TAKEAWAY 4:

Any contemplated evolution will only be relevant if the new infrastructure enables transactions to be carried out with the best performance and security levels. A shared ledger could help ensure a sufficient level of investment in cyber security by overcoming under-investment by private parties: this ledger, sustained by a public-private partnership would lead to greater investment in cyber security, increasing overall system resilience.[23]

KEY CONSIDERATIONS	KEY TAKEAWAYS
Key consideration 1: European markets should take up the issue of speeding up settlement. The move towards instantaneity has an impact on intraday cash management.	**Key takeaway 1: A "tool-based" approach should be preferred over a "player-based" one, highlighting the need for standardised methods and interoperability.** The European financial centre must develop a unified platform that allows all operators to conduct their activities in a standardised, integrated and natively interoperable manner.
Key consideration 2: European markets should consider providing a common facility servicing collateral management and corporate actions in order to enhance processes, in terms of risk reduction, efficiency and cost reduction.	**Key takeaway 2: This platform should be grounded in a collaborative framework that engages both public and private stakeholders.**
Key consideration 3: European unified DLT-based platform should natively incorporate interoperability with both European and non-European FMIs.	**Key takeaway 3: The provision of a tokenised wholesale CeBM as settlement solution would strengthen the financial system and reinforce the euro's role, unlocking the potential of tokenised finance and promoting greater trust in these emerging technologies..**
Key consideration 4: The hurdles for small and mid-caps to access financial markets might in part stem from the fragmentation of infrastructures.	**Key takeaway 4: Any contemplated evolution will only be relevant if the new platform enables transactions to be carried out with the best performance and security levels.**
Key consideration 5: Financial market infrastructures should enable the circulation of relevant information and data accompanying assets.	

FIGURE 3 – Key considerations and key takeaways

23 See: III. Blueprint for the future monetary system: improving the old, enabling the new (bis.org)

Conclusion

Transition towards a DLT-based infrastructure should not be a "big bang", as current market infrastructures already provide state-of-the-art services for most use cases in payments and securities settlement. The length of the transition period is difficult to estimate, since it depends on multiple actors. If rushed, the transition will result in significant complexity and additional cost due to the coexistence of old and new circuits. A more suitable approach would be the constant improvement of traditional infrastructures, coupled with the development by public and private actors' cooperation of DLT-based infrastructures for certain market segments where innovation would be particularly useful. There is a need for a balanced approach that fosters innovation while ensuring financial stability and competitiveness in the global market. This approach will only be able to achieve its objectives if all market players are fully united and aligned both on the envisaged strategy and on the proposed route. Coordination and dialogue are therefore of the utmost importance.

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