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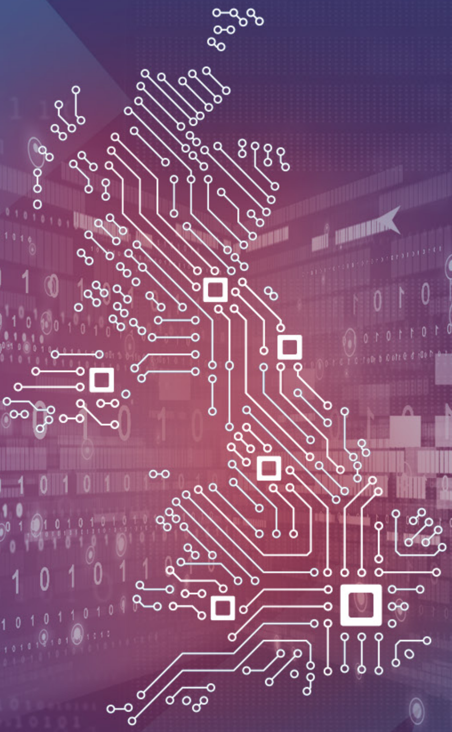
# The digitalisation of UK capital markets:

## Digitalised financial market infrastructure and tokenised bonds



**About TheCityUK**

TheCityUK is the industry-led body representing UK-based financial and related professional services. We champion and support the success of the ecosystem, and thereby our members, promoting policies in the UK and internationally that drive competitiveness, support job creation and enable long-term economic growth. The industry contributes 12% of the UK's total economic output and employs over 2.4 million people – with two thirds of these jobs outside London across the country's regions and nations. It pays more corporation tax than any other sector and is the largest net exporting industry. The industry plays an important role in enabling the transition to net zero and driving economic growth across the wider economy through its provision of capital, investment, professional advice and insurance. It also makes a real difference to people in their daily lives, helping them save for the future, buy a home, invest in a business and manage risk.

**About Hogan Lovells**

Hogan Lovells is an international law firm co-headquartered in London and Washington, D.C., with 2,800 lawyers working in more than 35 offices in the United States, Europe, Latin America, the Middle East, and Asia.

Our Digital Assets and Blockchain (DAB) Practice is made up of market leading lawyers across financial services regulation, technology, commercial, litigation, competition, and intellectual property practices, who leverage a wealth of experience and expertise to support our clients on the most complex and first-in-kind matters arising across the digital finance industry.

Hogan Lovells is consistently ranked as one of the most innovative law firms in Europe by the Financial Times, Band 1 for the Chambers UK Blockchain and Cryptocurrency, and Tier 1 in Legal 500 Fintech.

# Contents

# Forewords

Digitalisation and the application of key technologies, such as distributed ledger technology (DLT), are reshaping the landscape of global finance. In this report, TheCityUK has collaborated with Hogan Lovells to consider the transformative potential of DLT in UK financial services, including securities tokenisation, and what critical steps the UK can take to unlock the digitalisation of UK capital markets.

The UK's financial and related professional services industry has long been world class in the use of technology, and this has been reflected in key innovations in DLT and tokenisation. The findings and recommendations outlined in this report are testament to the potential of digitalisation to drive growth, enhance efficiency, and maintain the UK's position as a leading international financial centre, while also catalysing economic growth across the regions and nations. In recent years, both the government and the industry's regulators have recognised this potential and have made positive progress to support the adoption of these technologies across the industry, from facilitating safe innovation through the Digital Securities Sandbox to enacting legislative reform to signify the strength of English law for digital assets transactions.

Leading jurisdictions around the world are embracing these technologies to deliver modern financial services. To keep pace with rapidly evolving technological innovations and other jurisdictions, and to secure the long-term international competitiveness of its financial and related professional services industry, the UK must take urgent action to further digitalise its capital markets.

As we navigate this digital transformation, industry, government, and regulators must continue to work together to create an environment that supports innovation. This report provides comprehensive recommendations to achieve this vision, highlighting the importance of collaboration, regulatory clarity, and strategic investment.

The steps we take today will determine our ability to lead in the global financial markets of tomorrow. To deliver a revitalised, dynamic and leading British economy, we must act now to digitise and modernise the UK's growth engine, our capital markets.

**Miles Celic OBE**
Chief Executive Officer, TheCityUK

The promise of DLT and tokenisation is immense. Not only can it deliver cost efficiencies to financial sector participants, it also has the potential to benefit companies, the wider economy and society. A faster settlement cycle can reduce counterparty risk, improve collateral mobility, and increase liquidity. Fractionalisation could enable more inclusive investor participation. Smart contracts will offer full life cycle programmability of digital assets and improved oversight of investments such as green bonds and government infrastructure projects.

Prominent jurisdictions in Asia and in Europe have already adapted their legal and operational frameworks to harness this potential and are now collaborating closely with technology providers, financial institutions and regulators to grow their trade in digital assets. The US is also expected to shift gear in this race to become a world leading hub for tokenisation.

The UK is home to deep capital markets, a world class FinTech industry, and English law is commonly relied upon to govern global bonds market transactions. However, the UK now needs to act urgently to maintain its position as a leading global centre for finance and technology and to help shape the future of global capital markets.

It is highly welcome that the UK government has provided for a UK Digital Securities Sandbox where DLT projects can be tested. Its announcement of plans for a digital gilt and a comprehensive cryptoasset regulatory regime are encouraging and the introduction the Property (Digital Assets etc) Bill provides helpful statutory confirmation that digital securities are capable of attracting property rights. The Bank of England and the Financial Conduct Authority (FCA) are also now participating in international collaboration led by the BIS innovation hub and the Monetary Authority of Singapore.

The UK will need to look holistically at the digital assets ecosystem to ensure that it is appropriately equipped to encourage growth while managing risk. This report with TheCityUK focuses on what additional action industry, regulators and the government can take to help make a success of the UK Digital Securities Sandbox and increase confidence in the digital bonds market. These actions are intended to help to step up the digitalisation of our capital markets and keep pace with other jurisdictions.

**Sharon Lewis**
Head of Financial Institutions & Co-Chair of Digital Assets & Blockchain Practice, Hogan Lovells International LLP

# Executive summary

## The digitalisation of capital markets will foster the growth of the wider economy

The government's 'mission for economic growth' depends on a successful financial industry. Thriving capital markets drive sustainable growth by providing essential finance and investment for companies to grow, invest in digital transformation, safeguard biodiversity and manage the transition to net zero. However, there is a real threat to the UK's position as a world-leading financial centre if the government, regulators and industry do not seize the opportunity to facilitate a timely digital transformation of the financial industry and, in particular, the UK's capital markets.

It is widely recognised that the digitalisation of capital markets and, in particular, the application of distributed ledger technology (DLT) and tokenisation of securities, has immense potential to unlock the growth of capital markets and the wider economy. It is estimated that DLT could unleash savings of approximately $20bn annually in global clearing and settlement costs. The total market for tokenised assets is predicted to be 10% of global GDP by 2030.[1]

## International competition

Those jurisdictions that lead this global transformation are expected to attract greater investment into their economies and have the potential to become the world's leading financial centres. Several jurisdictions are already actively pursuing first-mover advantages by:

- Trialling the digitalisation of their financial industry, in particular through the use of DLT and tokenisation of securities including digital bonds.
- Experimenting with or testing central bank digital currencies and stablecoins in recognition of the expectation that digital money will form an essential component of a fully integrated digital financial sector.
- Providing legal and regulatory clarity about the ownership of digital assets.

The UK is participating in some of these new pilot projects (such as the Bank for International Settlements Innovation Hub's Project Agora and the Monetary Authority of Singapore led Project Guardian). The UK has also launched a Digital Securities Sandbox (DSS) and proposed legislation to provide greater legal certainty that digital assets are capable of attracting property rights under English law. However, the US is set to unlock its digital assets markets and the UK currently sits behind other markets such France, Germany, Luxembourg, Hong Kong and Singapore when it comes to digital bond issuances. If the UK wants to continue to play a leading role in shaping the future of the global financial system, it needs to scale and speed up its adoption of these new technologies and become a key jurisdiction for digital capital markets.

Various reports have already recommended ways of contributing to the successful digitalisation of the UK's financial services industry. This report highlights two critical aspects of this transformation:

- How to make a success of digital financial market infrastructure sandboxes.
- The effective digitalisation of the bonds market.

## Making a success of digital financial market infrastructure sandboxes

This report sets out some concrete actions that the industry, government and regulators can take to maintain the UK's leading position as an international financial centre. Participants in the DSS should be able to experiment with trading and settlement models. The authorities must continually adapt, maintain strong industry dialogue and remain flexible, learning lessons from experiences in the UK and other jurisdictions to fully realise the benefits of these transformative technologies. The authorities should consider the possibility of a cross-border DSS, and work towards the inclusion of a digital money settlement to showcase the UK's ability to provide the infrastructure to support the tokenisation lifecycle on a cross-border basis. Clarity is particularly needed on how to deliver the payments leg on DLT, i.e., the transfer of money from the buyer to the seller in a securities transaction (for instance, by stablecoin or tokenised deposits).
An industry taskforce should be established to consider how best to enable the interoperation of operational and legal ecosystems for digital and traditional financial market infrastructure (FMI) across different jurisdictions. While the sandbox provides a welcome opportunity to test innovative technologies, it is important that:

- Regulators should avoid allowing sandbox arrangements to lead to unnecessary risks to operational resilience.
- An industry forum should be established to enable the views of participants (and potential future participants) to be taken into account in the development of policy and regulation.
- HM Treasury (HMT) and the regulators continue to acknowledge that firms can use DLT outside the scope of the sandbox.

[1] GFMA, 'Impact of Distributed Ledger Technology in Global Capital Markets', (May 2023), available at: https://www.gfma.org/wp-content/uploads/2023/05/impact-of-dlt-on-global-capital-markets-full-report.pdf

## The effective digitalisation of the bonds market

The UK plays host to a sizeable bond market and internationally bonds have typically been issued under English law in preference to other legal regimes.

Many other jurisdictions around the globe are already competing for the growth in tokenisation of this market: there are increasing sovereign, sub-sovereign and supranational issuances of digital bonds alongside bespoke legislation and proactive policies relating to trade in digital assets. The UK must act swiftly to keep pace with evolving international legal developments and market practices regarding the issuance and transfer of digital bonds.

The recent introduction of the Property (Digital Assets etc) Bill promises welcome clarification that digital assets are capable of attracting property rights under English law. To enhance market confidence, expert bodies and industry groups should establish very clear pathways to facilitate the issuance of digital bonds. In line with the recommendations from the Law Commission of England and Wales (the Law Commission), the government should also provide statutory clarity on collateral arrangements and the collateral eligibility of digital securities.

The government announcement that it intends to pilot a digital gilt is highly welcomed. This report recommends that concrete actions are taken in early 2025 to deliver this ambition. It is also vital to ensure that the timeline and project sequencing for a digital gilt are designed to foster secondary market use cases, as this is where the potential for growth will be realised. The government should also leverage the National Wealth Fund at the earliest opportunity to incentivise private sector investment in tokenisation. Finally, we recommend that the government review the way in which the current wholesale tax regime interacts with tokenised securities.

# Summary of recommendations

**To be actioned:** Immediately | Medium term | Ongoing

| | Recommendation | Timeframe | Responsibility HMT | FCA | BoE | Industry |
|---|---|---|---|---|---|---|
| | **Industry-led projects** | | | | | |
| 1 | Convene an industry working group to determine what needs to be in place to encourage the digitalisation of capital markets. | H1 2025 | x | | | x |
| 2 | Adopt industry-wide standards for the consistent and safe use of DLT and digital assets across both primary and secondary markets. | H1 2025 | x | x | x | x |
| | **Making a success of the digital FMI sandboxes** | | | | | |
| 3 | Look at lessons learned from the EU's DLT Pilot Regime to ensure that the UK FMI sandbox provides an attractive forum for firms to test new trading and settlement models. | Ongoing | x | x | x | |
| 4 | Ensure that clearly defined criteria set out what is required for firms to be able to easily navigate the UK FMI Sandbox requirements. | Ongoing | | x | x | |
| 5 | Remain flexible and maintain a strong dialogue with the industry, to understand practical issues such as development costs. | Ongoing | | x | x | |
| 6 | Ensure that the projects that are progressed through the DSS do not introduce operational resilience risks that are not managed to a level consistent with the traditional FMIs. | Ongoing | | x | x | |
| 7 | Continue to acknowledge that firms can use DLT outside the scope of the DSS. | Ongoing | | x | x | |
| 8 | Explore the possibility of an international dimension to a UK FMI sandbox /cross-border sandbox. | H2 2025 | x | | | |
| 9 | Create an industry forum for information sharing that includes non-participant firms, to ensure transparency and broader representation of market participants when considering regulatory guidance and policy changes. | H1 2025 | | x | x | x |

| | Recommendation | Timeframe | Responsibility HMT | FCA | BoE | Industry |
|---|---|---|---|---|---|---|
| | **A digital payments leg solution** | | | | | |
| 10 | Provide further clarity on the regulatory treatment of stablecoins, including suitability for settlements of wholesale transactions. | H1 2025 | x | x | x | |
| 11 | Consult further on barriers to adopting tokenised deposits and provide the regulatory clarity to unlock huge investment in the UK. | H2 2025 | x | | | |
| 12 | Set up an industry taskforce to determine the appropriate arrangements to enable the interoperation of operational and legal ecosystems for digital FMIs. | H1 2025 | x | | | x |
| | **Digital bonds** | | | | | |
| 13 | Establish the UK as a leader by taking concrete steps towards issuing a pound sterling digital gilt. | H1 2025 | x | | | |
| 14 | Ensure that the timeline and project sequencing for a digital gilt are designed to foster secondary market use cases | H1 2025 | x | | | |
| 15 | Leverage the opportunities presented by the National Wealth Fund to incentivise private sector investment in tokenisation. | Ongoing | x | | | |
| 16 | Work with the industry to develop market standards, market infrastructure and wider policy initiatives, to establish longer-term confidence in policy support for digitalised capital markets. | Begin in H1 2025; Ongoing | x | x | x | x |
| 17 | Convene industry groups in the UK to establish clear pathways to facilitate the issuance of digital bonds. | Ongoing | x | | | x |
| 18 | Work with international bodies to establish common/ interoperable standards for pathways to digital bond issuance, custody and transfer. | Ongoing | x | | | x |
| 19 | In line with recommendations from The Law Commission, provide regulatory and statutory clarity on collateral arrangements and the collateral eligibility of digital securities. | H1 2025 | x | | x | |
| 20 | Review how the current wholesale tax regime interacts with tokenised securities. | H2 2025 | x | | | |



# Introduction

The UK's role as a world-leading international financial centre and hub for financial and related professional services is central to realising the government's 'economic growth mission'. In its recent consultation on a modern industrial strategy, the government identified financial services as one of the eight growth driving sectors of the UK economy, noting that "the UK's financial services sector has a unique, core role to play in delivering growth across the whole economy.[2] The UK economy requires significant public and private investment to meet the government's agenda for growth. At the heart of this, thriving and well-functioning financial markets supply capital for investment and growth and underpin the jobs, pensions, investments and savings of UK citizens. Capital markets play a vital enabling function, driving sustainable growth across the economy by providing essential finance and investment for companies to grow and remain competitive at a time of unprecedented global disruption. They mobilise private capital to finance the digital transformation, safeguard biodiversity and manage the transition to net zero, against a backdrop of widespread global political and economic uncertainty.

This report highlights the very real threat to the UK's position as a world-leading financial centre if the government, regulators and the industry do not seize the opportunity to facilitate a timely digital transformation of the UK industry, particularly capital markets. The Financial Conduct Authority (FCA) recognises that capital markets are increasingly international, and it is engaged in an ambitious package of reforms aimed at making the ecosystem more attractive both to companies raising capital and to investors deploying it. Its recent overhaul of the listing regime and the relaxation of the investment research rules are clear examples of reforms designed to make UK capital markets more attractive and competitive again.[3] We welcome the government's commitment to "take advantage of trends in digitalisation [in financial services], to attract the firms of the future and increase productivity across the economy"[4] in its proposed Industrial Strategy.

It has been widely recognised that the digitalisation of capital markets has immense potential to unlock the growth of capital markets and the wider economy. The Bank of England (BoE) and FCA noted that "the use of new and innovative technologies in global finance can create a more efficient, competitive, and robust financial system that helps facilitate economic growth."[5] In particular, the application of DLT could make 'post-trade' processes and collateral management more efficient, leading to savings across financial market participants such as pension funds, investment firms and banks. Any efficiencies realised by firms could lead to enhanced productivity and potentially provide additional

[2] Department for Business and Trade, Closed Consultation, 'Invest 2035: the UK's modern Industrial Strategy', (November 2024), available at: https://www.gov.uk/government/consultations/invest-2035-the-uks-modern-industrial-strategy/invest-2035-the-uks-modern-industrial-strategy
[3] FCA, 'Primary Markets Effectiveness Review: Feedback to CP23/31 and final UK Listing Rules', (July 2024), available at: https://www.fca.org.uk/publication/policy/ps24-6.pdf
[4] Department for Business and Trade, Closed Consultation, 'Invest 2035: the UK's modern Industrial Strategy', (November 2024), available at: https://www.gov.uk/government/consultations/invest-2035-the-uks-modern-industrial-strategy/invest-2035-the-uks-modern-industrial-strategy
[5] FCA and Bank of England, 'Digital Securities Sandbox joint Bank of England and FCA consultation paper' (April 2024), available at: https://www.bankofengland.co.uk/paper/2024/cp/digital-securities-sandbox-joint-bank-of-england-and-fca-consultation-paper

capacity for investment. Research by the Global Financial Markets Association (GFMA) estimated that DLT could unlock operational savings of approximately $20bn annually in global clearing and settlement costs[6] offering fast, efficient and secure transactions on a modern technology platform. The OECD has also reported on the "plethora of potential benefits" of tokenisation, whilst noting that there were obstacles to the growth of this market.[7]

Securities, and other financial and real-world assets, can be represented in digital form using DLT. This is known as tokenisation. Last year, UK Finance reported that securities tokenisation offers a wide range of benefits compared to traditional models, including "fractionalisation, unlocked capital, and improved risk management".[8] The total market for tokenised assets is predicted to be 10% of global GDP by 2030.[9] Those jurisdictions that lead this global transformation are expected to attract greater investment into their economies and position themselves as among the world's leading financial centres. Heightened global competition, including the emergence of new international finance centres, means that there is a strong focus on enabling digitalisation to improve efficiency and transparency in capital markets and beyond. Several markets are actively pursuing first-mover advantages by:

- Trialling the digitalisation of their financial industry: in particular through the use of DLT and the tokenisation of securities including digital bonds.
- Experimenting with or testing central bank digital currencies and stablecoins, with the expectation that 'on-chain' money will form an essential component of a fully integrated digital financial sector.
- Providing legal and regulatory clarity about the ownership of digital assets, for example through enhanced visibility of beneficial ownership.

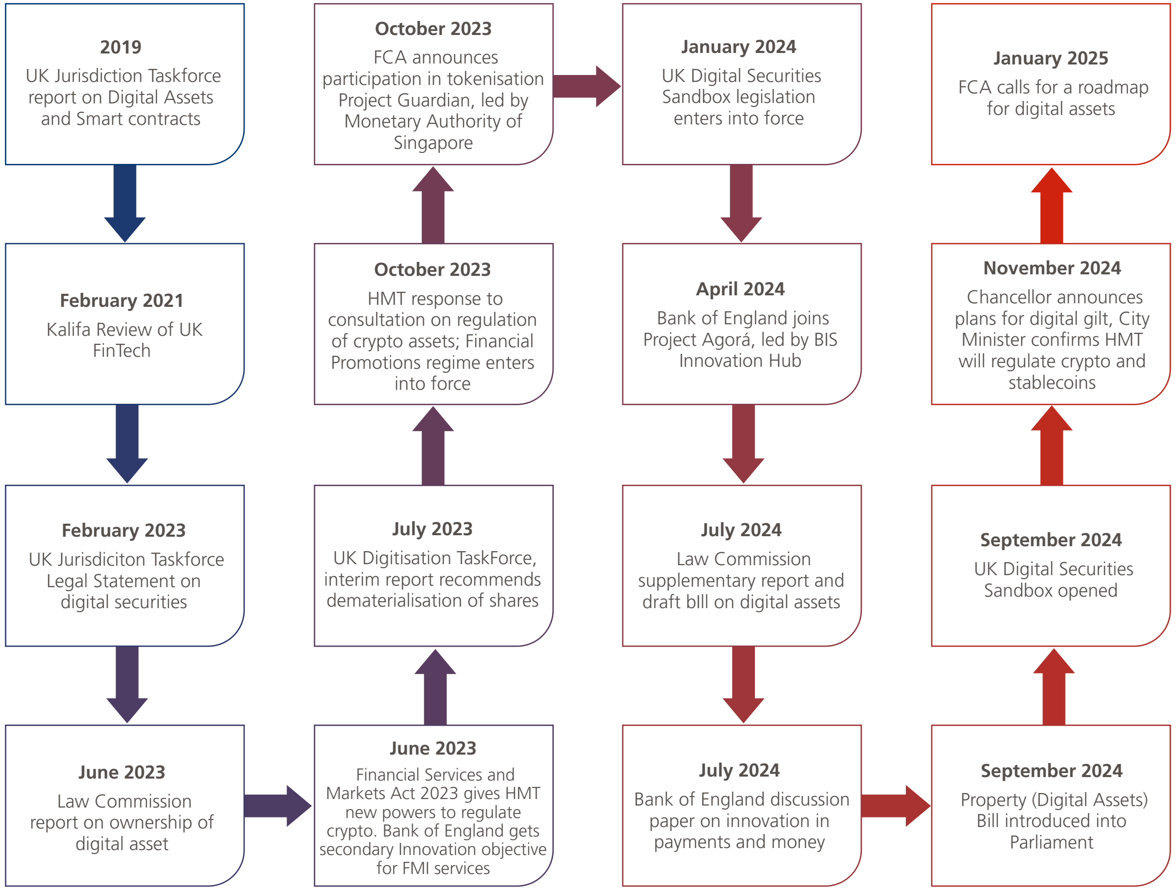
[6] GFMA, 'Impact of Distributed Ledger Technology in Global Capital Markets', (May 2023), available at: https://www.gfma.org/wp-content/uploads/2023/05/impact-of-dlt-on-global-capital-markets-full-report.pdf
[7] OECD, 'Tokenisation of assets and distributed ledger technologies in financial markets: Potential impediments to market development and policy implications', (January 2025), available at: https://www.oecd.org/en/publications/tokenisation-of-assets-and-distributed-ledger-technologies-in-financial-markets_40e7f217-en.html
[8] UK Finance, 'Unlocking the Power of Securities Tokenisation', (July 2023), available at: https://www.ukfinance.org.uk/policy-and-guidance/reports-and-publications/unlocking-power-securities-tokenisation
[9] BCG, and ADDX, 'Relevance of on-chain asset tokenization in crypto winter', (May 2022), available at: https://web-assets.bcg.com/1e/a2/5b5f2b7e42dfad2cb3113a291222/on-chain-asset-tokenization.pdf

Momentum for tokenisation has been building in the UK, for example on fund tokenisation. The UK is participating in some international pilot projects, such as the Bank for International Settlements (BIS) innovation hub's Project Agora. The government has also signalled its ambition to make the UK a global hub for securities tokenisation. The FCA has called for a "UK financial services digital infrastructure plan" and advocates a "bold approach to move to an electronic form of securities" and a "roadmap for digital assets".[10] Meanwhile, other key markets such as France, Germany and Luxembourg are embracing innovation to modernise key FMI and improve the delivery of financial services, including the offering of a wide range of financial markets products, positioning themselves as leaders in securities tokenisation. The UK currently sits behind others such as France, Germany, Luxembourg, Hong Kong and Singapore when it comes to digital bond issuances. Outside the UK, international markets are well-primed to adopt DLT and some other jurisdictions have introduced DLT laws and policies[11] or begun testing new forms of FMIs. This includes significant progress by some European Union (EU) countries. Meanwhile, President Donald Trump has committed to making the United States (US) "the crypto capital of the planet".[12] It is likely, therefore, that the US will take proactive measures to incentivise US trade in digital assets and tokenisation.

The UK is actively seeking to enable digital securities to be issued, traded and settled on UK FMI, and some important steps have already been taken. Notably, the introduction of a UK DSS for FMI, which provides the UK with a platform to showcase its ability to provide the infrastructure to support DLT. The FCA notes this is key to consolidating the position of UK capital markets in a competitive global marketplace.[13] The government has identified legislation that can be modified for the purposes of DSS, including the Government Stock Regulations, which would support the issuance of a digital gilt.[14] The government has also introduced legislation to provide legal certainty that digital assets have the characteristics of property and are not prevented from attracting property rights. The Property (Digital Assets Etc.) Bill, the UK Jurisdiction Taskforce (UKJT) legal statements and a report by The Law Commission on Digital Assets, provide reassurance that certain digital assets are capable of attracting property rights under English Law. Indeed, digital bonds

[10] See City minister speech on tokenisation (November 2024), available at: https://www.gov.uk/government/speeches/keynote-address-at-the-tokenisation-summit-uk-government-approach-to-tokenisation-and-regulation; and the FCA letter to HM Government, 16 January 2025, available at: https://www.fca.org.uk/publication/correspondence/fca-letter-new-approach-support-growth.pdf
[11] For instance in Hong Kong the Hong Kong Monetary Authority has introduced a flexible supervisory approach to encourage use of DLT (January 2025), available at: https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2025/20250108e1.pdf
[12] Stated by Donald Trump at the 2024 Bitcoin Conference in Nashville. As referenced here: https://www.forbes.com/sites/jonegilsson/2024/11/08/what-trumps-election-really-means-for-crypto/
[13] Speech by Sarah Pritchard at the Capital Markets Industry Taskforce conference (September 2024), available at: https://www.fca.org.uk/news/speeches/fca-new-listing-rules-and-whats-come
[14] These Regulations bring the Stock Transfer Regulations 1985 and Government Stock Regulations 2004 within the scope of the FMI Sandbox powers. The Explanatory Memorandum states, "Bringing the GSRs and the STRs into scope of the FMI Sandbox powers under FSMA 2023 would facilitate the possibility of sovereign debt issuances utilising distributed ledger technology, under the DSS (December 2024). Available at https://www.legislation.gov.uk/uksi/2024/1347/pdfs/uksi_20241347_en.pdf; The Explanatory Memorandum is available at: https://www.legislation.gov.uk/uksi/2024/1347/pdfs/uksiem_20241347_en_001.pdf

## Digital Securities: Key recommendations and steps taken by UK authorities




have been successfully issued under English law (albeit primarily offshore), and the BoE is working with the industry and with other central banks to test the viability of a UK retail central bank digital currency (rCBDC), i.e. a digital pound.[15]

However, if the UK wants to play a part in shaping the future of the global financial system, it needs to scale and speed up its adoption of these new technologies. The more widespread the digitisation effort across the industry, the more efficient and dynamic the capital markets will be, and the more likely it is in the longer term that the UK will support a successful digital transition and retain its position as a leading global financial centre. In 2021 the Kalifa Review recommended the adoption of a new framework to permit the digitisation of FMI.[16] There is now a window of opportunity for the UK to learn from the challenges faced by, and successes achieved in, other jurisdictions and embrace a 'second-mover advantage'.

This report highlights two critical aspects of this transformation: effective digitalisation[17] of both FMI and bond markets. The report builds on existing work to evaluate critical steps that the government, regulators and industry should take to urgently promote the digitalisation of FMI and bond markets, including the introduction of digital money, to harness the benefits of DLT and obtain a world-leading position in securities tokenisation. We acknowledge that the complete modernisation of the UK's capital markets will also entail the implementation of other technologies, such as artificial intelligence (AI). While the DLT layer must accommodate AI for future flexibility and maximisation of potential, the use of AI by the financial services industry is covered extensively elsewhere. It is therefore outside the scope of this report.

The recommendations in this report are designed to support the government's 'mission for economic growth'. They are also central to the FCA's and the Prudential Regulation Authority's (PRA) secondary objectives to support the international competitiveness and growth of the UK economy in the medium to long term, and the Bank of England's secondary objective to facilitate innovation in the provision of FMI services, strengthening the UK's position in a rapidly evolving and increasingly competitive global market. It goes without saying that they also need to be seen in the wider international context, in which digitalisation and open digital trade face restrictions across many jurisdictions, in the form of data-localisation requirements and other curbs on the free flow of data, including the possibility of customs duties on electronic transmissions, should the World Trade Organization (WTO) Moratorium on these come to an end. While this report does not cover these wider issues, they are part and parcel of the UK's quest for competitiveness in digitalised financial markets. We welcome the steps taken by the WTO and other international bodies to promote agreed international regimes for open global trade in data-dependent services.

[15] Bank of England, 'Progress Update on the digital pound', (January 2025), available at:https://www.bankofengland.co.uk/report/2025/digital-pound-progress-update

[16] Ron Kalifa OBE, 'Kalifa Review of UK FinTech' (February 2021), available at: https://www.gov.uk/government/publications/the-kalifa-review-of-uk-fintech

[17] While the terms 'digitisation' and 'digitalisation' are often used interchangeably, they have distinct meanings. In the context of this paper, digitisation is the process of converting physical objects into digital form, whereas digitalisation refers to the wider transformation of processes using digital technology.

# 1. The digitalisation of financial market infrastructure: a pathway to growth

The BIS 'principles for financial market infrastructures' define an FMI as:

> ***"A multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling or recording payments, securities, derivatives or other financial transactions."***[18]

In the UK, FMIs include central counterparties, central securities depositories (CSDs), recognised payment systems and recognised investment exchanges. FMIs are fundamental to the financial industry as a whole. Sometimes explained as the 'plumbing' of the financial system that takes place behind the scenes, FMIs allow millions of transactions to occur every day in the UK. They allow payments to be made, securities such as shares and bonds to be traded, and banks to provide financing to participants in the financial markets. The efficiency, stability and international competitiveness of the UK's financial system could be significantly improved through the digitisation of FMIs, including the deployment of DLT.

## 1.1 The transformation potential of tokenisation

Tokenisation offers exciting opportunities to improve FMIs, creating benefits not just for FMI operators themselves but also for those firms that use or otherwise rely on the services of FMIs. Some examples include:

- **Innovation and efficiency:** DLT could reduce the use of paper records and the number of intermediaries required to process transactions. DLT enables smart contracts[19] to be stored and executed. Integrating smart contracts can automate processes, set out the pre-determined criteria for when transactions can be executed, and have red flag notifications that do not depend on human 'issue-spotting'. Collateral management has been identified as a key use case where efficiencies can be achieved, as demonstrated in a recent pilot to tokenise gilts, Eurobonds and gold on the Canton Network that was conducted by Digital Asset, Euroclear and the World Gold Council. The pilot demonstrated "how tokenised assets on a blockchain can enhance collateral mobility, improve liquidity, and increase transactional efficiency".[20] Other key jurisdictions have already moved from a T+2 to a T+1 settlement period, most notably the US in May 2024. Existing infrastructure may be capable of supporting a transition to T+1, or even T+0.

[18] Bank for International Settlements, 'Principles for Financial Market Infrastructures', p.13 (April 2012), available at: https://www.bis.org/cpmi/info_pfmi.htm
[19] A smart contract is a self-executing computer protocol that automates an action upon fulfilment of a predetermined condition – i.e., when the terms of the contract are met. While some aspects of smart contracts can be implemented in more traditional systems as well as DLT, these are limited and require involvement of the central system.
[20] Canton, 'Unlocking collateral mobility through tokenization: Gilts, Eurobonds and Gold' (October 2024), available at: https://www.canton.network/unlocking-new-collateral-pools-and-24x7-mobility



However, DLT could allow near instantaneous settlement upon fulfilment of smart contract conditions, making it a powerful tool to help facilitate an accelerated settlement cycle and reduce counterparty risk.

- **Transparency:** Another key innovation offered by DLT is the transparency and immutability of records at any point in the process. As the same information is visible simultaneously to all participants, the shared ledger provides a single source of truth. This could improve accountability and reduce reliance on backward looking, time lagged reporting. For example, this could help investors to monitor the ESG credentials of the securities they hold. In the commodities sector, DLT could enhance understanding of the sustainability of supply chains and whether there have been any 'lifetime events' in the journey of a commodity – from extraction to refinement to acceptance for listing on an exchange – that may affect the legal or regulatory obligations of any party in the supply chain. Transparency attributes offered by directly accessible, embedded, secure data could benefit the environment and society beyond the financial industry.
- **Security:** The transparent and immutable nature of DLT could lower error and manipulation risk, which could help combat economic crime. Smart contracts could also encode information about whether a client has passed a Know Your Customer (KYC) process, or whether an asset that is traded, cleared or settled through an FMI is criminal property or subject to sanctions. While many issuers rely on regulated intermediaries for customer due diligence, DLT could enable more automated and efficient verification of customer identities and transactions, strengthening anti-money laundering (AML) controls.
- **Inclusion:** Integrating DLT across the financial industry could create more inclusive capital markets. The UK has one of the highest densities of new businesses in the world[21], with 5.6 million small and medium sized enterprises (SMEs) operating here as of 2020. One factor that draws these firms to the UK is access to finance. Securities are a core form of financing and businesses need to be able to access finance streams to grow, develop new products and services, and hire new people. The possible efficiency gains from DLT could reduce the cost of issuances and allow more businesses to participate in capital markets (in particular SMEs), unlocking their growth potential. Importantly, it could also open up access to appropriately sized (and guard-railed) investment opportunities for individuals who may not previously have had easy access to such investments. Other jurisdictions have opened up digital municipal bonds to stimulate local investment.[22] As the UK relies increasingly on private capital to invest in growing our economy, we need to provide the right environment to attract that capital.

However, various obstacles prevent digital FMIs from growing and reaching their full potential in the UK. While DLT offers potentially transformative benefits to FMI, as with any new technology this comes with associated risks and challenges, which must be overcome:

[21] World Bank (2020). The World Bank Entrepreneurship Database defined as the new businesses registered per 1,000 working aged people. Available at: https://www.worldbank.org/en/programs/entrepreneurship
[22] For example, digital bonds have been issued by various Swiss cantons and also by municipalities in the US.

- **Upfront cost:** DLT is still a relatively new and evolving technology and while future efficiency gains could reduce costs, significant upfront investment is required for early adoption and testing of these technologies, with no guarantee of future scale to justify the investment cost.
- **Data complexities:** While immutability has benefits, it may not be possible to correct compromised data, which could impair data integrity. There is an important distinction between what may be immutable in practice (due to the operation of the DLT ledger) and what is immutable in law. For example, insolvency laws provide for certain transactions to be unwound in some circumstances, and it is for this reason that traditional FMIs benefit from special legal protections in support of the finality of the transactions accepted into their systems. However, upgrading information on DLT can be challenging, with the risk of 'forking' occurring i.e. the splitting of the ledger into two different paths, either intentionally or by accident. While forks can sometimes result in positive innovations, they may also compromise the stability, security, and effectiveness of DLT, which could present material risks in the context of an FMI, where the integrity of the ledger is paramount.
- **Standards and interoperability:** A lack of commonly accepted standards and interoperability both between different DLT platforms, and between digital and traditional FMI can make it difficult for systems to interact and scale. For tokenised securities to fully realise their potential, it is vital to establish industry-wide standards and ensure interoperability. This requires engaging market participants, policymakers and regulatory bodies to ensure that the standards align with industry needs and regulatory frameworks. International projects that are seeking to achieve this are currently spearheaded from other jurisdictions. For example, Project Guardian – which is sponsored by the Monetary Authority of Singapore (MAS), and includes participation by the FCA and other national authorities – is focusing heavily on cross border collaboration to test tokenisation use cases and enhance liquidity and efficiency of financial markets.[23] The MAS is also contributing to the interoperability efforts and aspirations of the BIS for a unified ledger[24] by convening a group of global financial institutions in its GL1 initiative.[25] With the success of pilot asset tokenisation use cases under Project Guardian and the successful completion of the first phase of the 'Global Layer 1' initiative, MAS is looking to further advance these efforts. This includes, amongst others, exploring the establishment of a non-profit organisation (GL1 Org) to develop principles, policies, and standards for operating global shared ledger infrastructure, alongside potential independent operating companies to build and deploy the GL1 infrastructure.

[23] The MAS Project Guardian advances digital asset pilots in fixed income, foreign exchange and asset management products, available at: https://www.mas.gov.sg/news/media-releases/2023/mas-partners-policymakers-to-foster-responsible-digital-asset-innovation; Another international experiment was conducted at the end of 2023 to demonstrate interoperability of independent blockchains via a 'Global Synchroniser': see report by Digital Asset, available at: https://www.scribd.com/document/737064635/Canton-Network-Pilot-Report-1548ed-1
[24] BIS, 'Blueprint for the future monetary system: improving the old, enabling the new' (June 2023), available at: https://www.bis.org/publ/arpdf/ar2023e3.htm
[25] Global Layer One, 'Foundation Layer for Financial Networks' (June 2024), available at: https://www.mas.gov.sg/-/media/mas-media-library/development/fintech/guardian/gl1---whitepaper.pdf

Ultimately, firms need certainty on legal, regulatory, economic and technical issues, as well as scaled-up demand for digital services, to secure the right balance of incentives for developing and carrying out transactions using modernised digital rails. FMIs are vital to the security and efficiency of the financial system and, therefore, stability and integrity must be at the heart of everything they do. While the regulatory landscape for DLT is still evolving, there will be ongoing uncertainty around legal and compliance requirements, which will continue to present a barrier to scaled adoption.

Despite the known challenges, a 2022 survey of FMI firms conducted by Nasdaq and ValueExchange found that "20% of firms in private equity, bond issuance, funds, and carbon credits reported plans to invest in DLT to drive their growth agenda".[26] A 2024 report by Global Digital Finance noted that over 90% of major finance firms surveyed in the US, Asia, Europe (including the UK) and the Middle East responsible for more than $221.75bn assets under management were already handling crypto currency in some shape or form, including as part of 'testing' the digital asset sector.[27] Therefore, while still nascent, there appears to be significant industry appetite to push ahead with DLT projects.

## 1.2 The international landscape

While there have been some initiatives in the UK to drive the digitalisation of capital markets forward, the UK is falling behind other key jurisdictions. In the EU, the Central Securities Depositories Regulation (CSDR) has required all newly issued securities that are admitted to trading to be immobilised or in a dematerialised format since 1 January 2023 – i.e. held and transferred electronically. As of the start of 2025, all EU-traded securities must be held electronically.[28]

The UK opted to drop the CSDR timelines following its withdrawal from the EU. The Secondary Capital Raising Review (2022) identified the "drive to digitisation and the use of developing technologies to transform how the capital markets operate", as an area where the UK can show international leadership, but only if "we are bold and brave".[29] One recommendation of this review was a UK Digitisation Taskforce to drive forward full dematerialisation of the UK's shareholdings framework. If an ambitious approach is taken, this important and long-due reform could enable the UK to not only catch up with but leapfrog other jurisdictions.[30] In TheCityUK's response to the Digitisation Taskforce Interim

[26] A number of FMIs are also preparing to modernise outdated legacy systems by 2028: Nasdaq,' Nasdaq Study Shows Legacy Technology and Regulation Preventing Financial Institutions From Capturing Growth Opportunities' (September 2023), available at: https://ir.nasdaq.com/news-releases/news-release-details/nasdaq-study-shows-legacy-technology-and-regulation-preventing
[27] Global Digital Finance, 'Crypto goes international 2024', (August 2024) available at: https://www.gdf.io/resources/crypto-goes-institutional-in-2024-with-etfs-as-major-drivers/
[28] European Union, Article 3 of `Regulation (EU) No 909/2014', (July 2014), https://eur-lex.europa.eu/eli/reg/2014/909/oj/eng
[29] Mark Austin, 'Secondary Capital Raising Review' (July 2022), available at: https://assets.publishing.service.gov.uk/media/62d5486f8fa8f50c0a8a3fd7/SCRR_Report__July_2022_final_.pdf
[30] For more detail, please see 'TheCityUK feedback to the UK Digitisation Taskforce interim report' (September 2023), available at: https://www.thecityuk.com/our-work/response-to-the-interim-report-issued-by-the-uk-digitisation-taskforce/

Report,[31] we noted that there was an urgent need to move towards dematerialisation. However, the dematerialisation of shareholdings is complex and is taking time to progress. Bonds and other financial market instruments are outside the scope of the Digitisation Taskforce. While the Taskforce considered the adoption of DLT as an option for the dematerialisation of shareholdings, their decision not to pursue a DLT based solution at that time highlights the need to urgently support the scale and speed of DLT adoption in the UK.

Singapore, Hong Kong, Switzerland, France, Germany and Luxembourg[32] have already positioned themselves as leaders in securities tokenisation. In the EU, several countries including France, Luxembourg, Germany and Spain, have taken steps to bring tokenised securities into their legal frameworks. The UK has been somewhat slower to update its legal and regulatory structures to facilitate digital instruments, and, crucially, has lacked a catalysing issuance programme from the official sector (cf. issuances of digital bonds by the EIB in Luxembourg[33] KfW in Germany[34] and France's Caisse des Dépôts et Consignations [CDC]).[35]

To support the government's ambition to make the UK a global hub for securities tokenisation, this report considers how the UK can unlock the digitalisation of capital markets in the following areas:

- industry-led projects
- FMI sandboxes
- digital money and digital bonds.

[31] ibid.
[32] For example, in October 2024, the Luxembourg financial regulator, the CSSF gave its approval to the first fully tokenised UCITS fund. https://www.luxembourgforfinance.com/en/news/franklin-templeton-to-launch-first-fully-tokenized-ucits-fund-in-luxembourg/
[33] European Investment Bank, 'EIB launches new digital bond as part of the Eurosystem Exploratory Work', (November 2024), available at: https://www.eib.org/en/investor-relations/press/all/fi-2024-13-eib-digital-bond-eurosystem-explanatory-work?
[34] KfW, 'KfW issues its first blockchain-based digital bond under the German Electronic Securities Act', (July 2024), available at: https://www.kfw.de/About-KfW/Newsroom/Latest-News/News-Details_812352.html
[35] Euroclear, 'Issuance of France's first Digitally Native Note', (November 2024), available at: https://www.euroclear.com/newsandinsights/en/press/2024/mr-36-france-first-digitally-native-note.html



# 2. The digitalisation of financial market infrastructure: unlocking tokenisation

## 2.1 FMI projects undertaken by industry

### Industry progress and challenges

Industry actors are at the forefront of developments in the digitalisation of FMI, including the use of DLT. Examples of industry progress:

- **LMEshield:** In 2016, to combat fraud, the London Metal Exchange (LME) created a platform that issues and manages receipts relating to commodities stored off-warrant in warehouses around the world. While this platform did not rely on DLT, Matthew Chamberlain, Chief Executive of the LME, has pointed out that there is potential for tokenisation in the commodities market: "An LME warrant is a perfect candidate for tokenisation. You have 25 tonnes of aluminium you could turn that into 25 one-tonne aluminium tokens".[36]
- **Euroclear DNN Issuance Service:** In October 2023, Euroclear launched its Digital Securities Issuance Service (D-SI), the first module of its Digital Financial Market Infrastructure (D-FMI) platform. The service enables the issuance, distribution and settlement of fully digital international securities – 'digitally native notes' (DNNs) – on DLT. It has enabled the World Bank to issue a DNN listed on the Luxembourg Stock Exchange (under English law), a $500m issuance programme from the Asian Infrastructure Investment Bank (under English Law), and the French CDC to issue a €100m bond as part of a Banque de France pilot of tokenised central bank money (under French law). Euroclear's digital platform is fully compliant with the EU CSDR, demonstrating that digital FMI can meet current regulatory requirements.[37]
- **Delta Capita and Montis collaboration:** Delta Capita, a leading capital markets consulting services and technology provider, has joined forces with Montis, a subsidiary of Archax focused on digital FMI. Their latest collaboration is aimed at transforming the capital markets industry and will cover use cases including delivery versus payment using deposit tokens and wholesale central bank digital currencies (wCBDCs).[38]

However, without common standards and greater collaboration on interoperability, the scale of adoption will not unlock the economic potential of tokenisation. To date, the fragmented individual and private explorations of DLT and

[36] As quoted in Financial News, (March 2024), available at: https://www.fnlondon.com/articles/lme-chief-matthew-chamberlain-theres-always-going-to-be-criticism-when-you-make-a-decision-20240304
[37] The inaugural DNN was issued by the World Bank (International Bank for Reconstruction and Development, IBRD, rated Aaa/AAA), raising €100m to support the financing of the World Bank's sustainable development activities and was listed on the Luxembourg Stock Exchange. Citi's Issuer Services acted as the issuing and paying agent, TD Securities as the dealer, and Euroclear Bank as the issuer Central Securities Depository.
[38] We explore the benefits of these use cases in the section below on Unlocking the potential of a digital payments leg solution.

a lack of standardisation have led to highly disparate DLT and digital asset initiatives. This has resulted in existing DLT propositions that vary significantly in areas such as their regulatory treatment of digital assets and custody processes; their technical connectivity, integration into legacy processes and eligibility standards; the management of core processes; and supervision and maintenance of smart contracts. These disparities, in turn, create uncertainty and costs which undermine the appeal and potential benefits of DLT for market participants, limiting adoption rates.

To invest in DLT, firms need certainty on the potential to scale digital systems. Standards and interoperability are key to support this.

### Standards

One of the main barriers to industry adoption is ensuring sufficient industry-wide engagement and collaboration. For example, when discussing the adoption of LMEshield, the LME noted that "the only way it can get the scale to be meaningful, is for the entire industry to buy in".[39] Achieving that buy-in can be challenging. Common internationally agreed standards can help by avoiding the need for industry participants to establish consensus from scratch for each project. Therefore, one of the necessary components of any new digitalised FMI system is the establishment of a common set of standards across processes, platforms and jurisdictions. Earlier this year, three leading FMIs – The Depository Trust & Clearing Corporation (DTCC), Clearstream, and Euroclear – collaborated with Boston Consulting Group (BCG) to release a white paper calling for increased industry collaboration and proposing a Digital Asset Securities Control Principles (DASCP) framework. The framework is based on a comprehensive set of risk management principles and controls designed to facilitate the adoption of tokenisation and to help drive broader conversation around standards. The principles outline a safe and efficient ecosystem, identify potential risks specific to digital asset securities, and provide appropriate recommendations for controls to mitigate these risks.[40]

### Interoperability

As new technologies develop, it is important to ensure that different ledgers are compatible and that new systems can still interface with the traditional system during an interim period. Ideally, any new technology should be compatible both with other new technologies and with traditional FMI. Interoperability is vital to enable a digital FMI system that can operate on a global scale in the same way as the traditional FMI system. It should be capable of being used by participants from multiple jurisdictions and, ideally, should be able to interface with FMIs from multiple jurisdictions

[39] As quoted in, Reuters, 'LME to re-boot electronic metals storage system after weak uptake', (July 2017), available at: https://www.reuters.com/article/markets/currencies/lme-to-re-boot-electronic-metals-storage-system-after-weak-uptake-idUSKBN19Y1V7/

[40] DTCC, Clearstream, Euroclear, BCG, 'Building the Digital Asset Ecosystem. Digital Asset Securities Control Principles: A Framework for Adoption' (May 2024), available at: https://www.dtcc.com/dtcc-connection/articles/2024/july/03/digital-asset-securities-control-principles-a-framework-for-adoption



(such as a clearing and settlement system that can support trading platforms from multiple jurisdictions). We welcome that the BoE and FCA policy statement on the new DSS confirms that this FMI sandbox is open to users from within and outside the UK (even if the DSS entrants operating the digitalised FMI must be established in the UK).

There could be interoperability obstacles between different DLTs but also between DLTs and traditional FMI systems. Connecting DLTs to the wider financial system will be crucial as some parts of the FMI ecosystem will inevitably digitise before others. Encouragingly, there has been progress in this area. For example, experiments conducted by Swift, working with the industry, have demonstrated that different ledgers can interoperate with each other and the existing financial system.[41] Open-source approaches with mature industry-governance frameworks are increasingly being adopted. For example, the Global Synchroniser Foundation is associated with the Canton Network.[42] If a firm can ensure its DLT system is able to interoperate with the wider FMI ecosystem, that may reduce some of the costs and uncertainty when making the initial investment.

## Next steps

As jurisdictions across the globe experiment with tokenised bonds, there is a risk of market fragmentation if too many technological and structural solutions arise without efforts to agree on international regulatory alignment or interoperability. Failing to address this would increase risk for investors and create a risk around functionality for issuers. This could result in significant missed opportunities for growth.

To overcome liquidity challenges in scaling tokenised securities, some industry participants have developed hybrid solutions, integrating the benefits of DLT with legacy systems. For example, HSBC's digital assets platform in Hong Kong, 'HSBC Orion', operates through the Hong Kong Monetary Authority's (HKMA) Central Moneymarket Unit (CMU). This integration allows digital bonds to be connected to the traditional CMU system, leveraging existing market infrastructure. Similarly, Euroclear's D-FMI is connected to the traditional settlement platform of Euroclear Bank for secondary market operations, granting investors full access to trading venues and liquidity management facilities.

To create further certainty on the potential to scale DLT systems, current industry initiatives need to evolve into an industry-wide effort to consolidate and connect digital liquidity based on common standards and processes. Ultimately, establishing industry-wide standards and interoperability will necessitate collaborative efforts from market participants, policymakers and regulators. A proactive approach will allow the UK to develop digital asset standards that both meet industry demands and comply with regulatory expectations.

[41] Swift, 'Connecting blockchains: Overcoming fragmentation in tokenised assets Swift's interoperability experiments connecting to public and private blockchain networks', (August 2023), available at: https://www.swift.com/news-events/news/successful-blockchain-experiments-unlock-potential-tokenisation

[42] GFS, 'Global Synchronizer Foundation', (January 2025), available at: https://sync.global/

## Recommendations: industry-led projects

| Who | Recommendation | Timeframe |
|---|---|---|
| HMT | **Convene an industry working group to determine what needs to be in place to encourage the digitalisation of the wider capital markets across both primary and secondary markets** – in particular for commodities and transition finance instruments. This should be led by industry but facilitated by HMT. | Q1 2025 |
| Industry, regulators and policymakers | **Adopt industry-wide standards for the consistent and safe use of DLT and digital assets.** Common standards could be adopted either through a relevant trade association or through BoE guidance on what is expected of FMIs when dealing with digital assets. The industry needs to agree a common process flow. This dialogue should be led by the industry and facilitated by HMT, together with the BoE. | Q1 2025 |

## 2.2 FMI regulatory sandboxes

### The potential of FMI sandboxes

As noted above, FMIs underpin the security and efficiency of the whole financial ecosystem and must be governed by strong regulation. Regulatory certainty is crucial to encourage innovation as developing DLT infrastructure is expensive, and firms need to be able to justify the investment with the potential to scale these systems.

A regulatory sandbox allows FMIs and user firms to experiment with new or different practices using developing technology, such as DLT, in the key FMI functions in a safe regulatory environment under temporarily modified legislation. This allows for innovation in a controlled environment while safeguarding wider financial stability.

A recent example of an FMI sandbox is the EU DLT Pilot Regime. The EU regulation implementing the DLT Pilot Regime noted that "[it] is important to ensure that Union financial services legislation is fit for the digital age", given that "union financial services legislation was not designed with distributed ledger technology and cryptoassets in mind". Hence, the DLT pilot regime modified some existing EU financial services legislation to test whether an amended regime "fit for the digital age" could be instituted.[43]

[43] Regulation (EU) 2022/858 'DLT-Pilot Regime': (May 2022), available at: https://eur-lex.europa.eu/eli/reg/2022/858/oj/eng

The UK has also launched its own FMI sandbox. The Financial Services and Markets Act 2023 (FSMA 2023) gave HMT powers to set up FMI sandboxes.[44] The first sandbox to be set up under these powers is the DSS, which allows firms to experiment with developing technology, such as DLT, in the issuance, trading and settlement of securities such as shares and bonds. This sandbox will be vital to identify further areas of regulation that need to be updated to facilitate the use of tokenised securities.

Following a consultation paper on how to operationalise the DSS,[45] on 30th September 2024, the BoE and the FCA published a policy statement and opened the Sandbox. As at January 2025, three DSS applicants have received Gate1 approval.[46] The outcomes that the regulators intend to achieve are:

- facilitating innovation to promote a safe, sustainable and efficient financial system
- protecting financial stability
- protecting market integrity including market cleanliness.

The International Regulatory Strategy Group (IRSG) – a joint venture between TheCityUK and the City of London Corporation – welcomed the proposed DSS as "a strong starting point for a flexible and commercial sandbox that is capable of laying strong foundations for the use of innovative technologies in the UK capital markets".[47]

Given the significance of this reform to the government's growth agenda, the DSS must benefit from the best possible execution to urgently modernise the UK's capital markets and inform future policymaking. At the same time, if the DSS does not deliver on its promises, this could negatively affect industry confidence. A successful FMI digital sandbox is key to unlocking securities tokenisation in the UK and the continued competitiveness of UK capital markets. The government has recognised this and committed to "advance the initial progress to introduce the financial market infrastructure regulatory sandboxes to work out the regulatory bottlenecks for tokenisation".[48] Therefore, this section identifies the key attributes that a UK FMI sandbox must possess to deliver on both the FCA and PRA's secondary competitiveness and growth objectives and the government's mission for growth.

[44] HMG, Financial Services and Markets Act 2023 (June 2023), available at: https://www.legislation.gov.uk/ukpga/2023/29/contents
[45] The consultation period ran from 03 April to 29 May 2024; Bank of England and FCA, 'Digital Securities Sandbox joint Bank of England and FCA consultation paper', (April 2024), available at: https://www.bankofengland.co.uk/paper/2024/cp/digital-securities-sandbox-joint-bank-of-england-and-fca-consultation-paper
[46] The Bank of England's DSS Dashboard lists the applicants and their status in the DSS, available at: https://www.bankofengland.co.uk/financial-stability/digital-securities-sandbox/digital-securities-sandbox-dashboard
[47] IRSG, 'Response to Bank of England and Financial Conduct Authority Digital Securities Sandbox consultation'; (May 2024); available at: https://www.irsg.co.uk/assets/Responses/IRSG-Digital-Securities-Sandbox-consultation-response-2024.pdf
[48] Labour, 'Financing Growth: Labour's Plan for Financial Services', (February 2024), available at: https://www.labour.org.uk/updates/stories/financing-growth-labours-plan-for-financial-services/

## Making a success of UK FMI sandboxes

**Attracting participation – domestically and internationally**

The UK should consider the EU's DLT pilot regime carefully. Despite its ambitions to render EU financial services legislation fit for the digital age, in April 2024 the European Supervisory and Markets Authority (ESMA) reported that only four applications had been received. For the DSS to generate meaningful data on what amendments to UK financial services legislation are appropriate, it will need to achieve higher adoption rates than the EU DLT Pilot Regime achieved. It is encouraging to see that the UK regime has already attracted applicants and granted some (preliminary stage) Gate 1 approvals.

As a voluntary regime, one of the DSS's design challenges is to create adequate incentives for a representative range of firms across the industry to participate. The broader the base of participation, the easier it will be for policymakers to establish whether the DSS's modified regulations can scale up safely to encompass the entire range of functions currently supported by the FMI ecosystem. Low participation may make policymakers question whether future FMI sandboxes are worthwhile.

The UK also has the opportunity to open the DSS to international participants. Allowing cross-border sandbox participation could serve as an effective tech bridge between the UK and other countries (see 'international participation' below). Broader eligibility criteria for participation should be considered for the next phase of the DSS.

As noted by the IRSG in its response to the DSS consultation, "The UK should learn from the EU's DLT Pilot Scheme and avoid the same shortcomings and limited entrants." While the BoE and the FCA have addressed many of these concerns in their DSS policy statement, there are still various obstacles to FMI firms participating that may prevent the DSS from reaching its full potential, but these can be mitigated as set out below.

- **Fees:** The DSS fee regime for participating firms presents a financial obstacle, especially for smaller firms and new entrants. These fees are more affordable for incumbent firms than smaller firms. The cost of fees is in addition to the costs of investing in new technology. The IRSG response noted that "participation in the DSS will be a costly process, both on account of the DSS fees payable but also the time spent on compliance and the potential cost of advisory fees throughout, creating a huge barrier to entry for smaller firms. By preventing smaller firms – often pioneers of innovation – from participating in the DSS, the UK could risk missing out on the full potential of the DSS to facilitate innovation."[49] A more proportionate approach to fees would help encourage participation by smaller firms and allow institutions of different sizes and business models to compete on an equal footing. The Bank of England and the FCA should keep the level of fees under review to ensure that they are proportionate and not adversely impacting participation in the sandbox.
- **Cliff-edge risk:** This is an issue that could affect all participating firms. Participating firms face a 'cliff-edge risk' when they move out of the DSS and begin operating under the general regulatory regime. This regime may have been permanently amended to reflect successful initiatives under the DSS. However, firms may also need to wind down some of their DSS activities. This wind-down risks operational disruption to firms who have become accustomed to operating within the DSS environment. Although the DSS policy statement offers some guidance on winding down, further clarity is needed on how firms will be supported through this. The guidance is also geared towards systemically important firms. Not all DSS participants would qualify as systemically important FMIs, even after graduating from the DSS. As with fees, the obligations on non-systemically important firms should be proportionate to ensure they are not disincentivised from participating. As a first step, we welcome the FCA and Bank of England's commitment to consider a regime for non-systemic FMIs which may be more appropriate for certain participants even once they have graduated from the DSS.[50]
- **Limits:** Another obstacle affecting all firms is limits on participation. The DSS will have overall capacity limits for certain asset classes (for example, corporate bonds are currently subject to a per-firm limit of £900m at go-live and a gradually increasing aggregate limit for all corporate bonds within the DSS of £17bn – £28bn). The proposed limits are currently set at a relatively low level, potentially allowing only a few transactions. Limits are in place to prevent systemic risk building up within the DSS that could affect the wider financial system. However, if limits are too low, they will prevent participants from simulating the scale of multilateral activity that FMI firms would need to be able to execute outside the DSS. This will deter entrants by limiting the prospects for scale and subsequent commercial gains. There is a balance to be struck between limiting systemic risk on the one hand and allowing the DSS to generate useful data and insights on the other hand. Currently, the balance may be too conservative. In its feedback to the consultation paper, the International Capital Markets Association (ICMA) noted that the design of the limits is "likely to disincentivise participation in the [DSS] and inhibit the UK's competitiveness".[51] The IRSG response also noted that there may be cases where the proposed limit will make the DSS unviable as a route for innovation – for example, for testing a digital sovereign debt issuance.

  We welcome the indication in the policy statement that limits can be increased during the operation of the DSS, but it is important to keep this under review to ensure the viability of the DSS.

[49] IRSG, 'Response to Bank of England and Financial Conduct Authority Digital Securities Sandbox consultation'; (May 2024); available at: https://www.irsg.co.uk/assets/Responses/IRSG-Digital-Securities-Sandbox-consultation-response-2024.pdf

[50] BoE and FCA, 'Joint Bank of England and FCA policy statement on the Digital Securities Sandbox, (September 2024), available at: https://www.bankofengland.co.uk/paper/2024/policy-statement/boe-fca-joint-approach-to-the-digital-securities-sandbox

[51] ICMA, 'ICMA's response to the Bank of England's and FCA's joint consultation on proposals to implement and operate the Digital Securities Sandbox' (May 2024); available at: https://www.icmagroup.org/assets/ICMA-response-to-BoE-FCA-joint-consultation-on-proposals-to-implement-and-operate-the-Digital-Securities-Sandbox-290524-v2.pdf

- **International participation:** Currently, only UK firms can enter the DSS.[52] Third-country firms and international groups of firms can apply to enter the DSS if they establish an entity in the UK. The UK could learn a great deal from firms participating from different parts of the world and reap the potential benefits of cross-border use cases. Narrowing the DSS to a domestic context limits the data that UK regulators and policymakers will obtain on how DLT could improve FMI on a global scale. Indeed, in a speech earlier this year, the FCA's Chief Executive, Nikhil Rathi, stated that "[the FCA] have concluded that to fully reap the rewards that tokenisation offers of efficiency, liquidity, and accessibility, we need globally connected networks to support globally connected firms."[53] Policymakers should explore the potential for the DSS and future FMI sandboxes to have a more international and cross-border dimension.

  In this context, we note that US Securities and Exchange Commission (SEC) Commissioner Hester Peirce suggested opening the DSS to US domiciled firms and instituting an information sharing agreement between the US and UK regulators (these were views of her own and did not necessarily reflect those of her fellow commissioners). While third-country firms are not currently able to become digital securities depositaries, it is very welcome that securities denominated in non-sterling currencies are eligible to be traded within the DSS. This will be particularly important even for UK-based issuers, who frequently issue in multiple currencies.

- **Joined up regulators:** All firms would benefit from a single point of contact with the FCA and BoE when participating in the DSS. We welcome the recent adoption by the regulators of a Memorandum of Understanding (MoU) on how they intend to cooperate in operating and supervising the DSS.[54] However, a single point of contact, much like that used for the joint PRA/FCA New Bank Startup Unit, would ensure that the regulators can manage DSS related activities in a streamlined manner and make coordinated and coherent decisions. This concept could be expanded to include international regulators for a multi-country sandbox.

### Addressing operational resilience risk

Operational resilience is explained by the BoE as "the ability of firms, and the financial sector as a whole, to absorb and adapt to shocks and disruptions, rather than contribute to them".[55] This is already an issue for FMI firms but becomes particularly pronounced in the context of digital FMI.

[52] The Financial Services and Markets Act 2023 (Digital Securities Sandbox) Regulations 2023, available at: https://www.legislation.gov.uk/uksi/2023/1398/contents/made
[53] Nikhil Rathi, speech delivered at the Investment Association Annual Conference 2024 on 'International regulatory developments affecting investment management', (June 2024), available at: https://www.fca.org.uk/news/speeches/international-regulatory-developments-affecting-investment-management
[54] Bank of England, 'BoE and FCA – Memorandum of Understanding on the supervision of FMI', (August 2024), available at: https://www.bankofengland.co.uk/news/2024/august/boe-and-fca-mou-on-supervision-of-financial-market-infrastructures
[55] Bank of England, 'Operational resilience of the financial sector', (March 2021), available at: https://www.bankofengland.co.uk/financial-stability/operational-resilience-of-the-financial-sector



One particular challenge comes from the potential existence of 'hybrid entities' operating multiple activities on one platform. Hybrid entities are those that combine the functions of a trading venue with those of a Central securities depositories (CSD). Hybrid entities can operate within the DSS. This represents a significant opportunity. While this may be a welcome development, if this technology fails the financial system may lose access to both a CSD but and a trading venue at the same time. Hybrid entities could, therefore, amplify the existing potential for issues with FMIs to spread to the wider financial system. The existence of hybrid entities compounds concerns around technology risk, which is already a concern for FMI firms. FMI firms may rely on a third party's service or technology to provide their own FMI services. An example would be a CSD relying on a technology from the cloud to carry out some of its key functions. The BoE has already published supervisory statements on operational resilience for traditional FMI firms.[56] We welcome the clarification in the BoE and FCA policy statement that DSS entrants themselves will not be treated as critical third parties. Concern about technology failure is likely to heighten given that DLT systems will represent a change from the way FMI firms traditionally operate. FMI firms will have to consider new dimensions of cyber risk presented by a technology they are less familiar with in their existing systems. At the same time, hybrid entities specifically may rely on the same third-party technology for both their traditional CSD activities and their trading venue activities. If that technology failed, this could compound the severity of the outcome for the financial services system as a whole.

### Including digital money

The DSS should facilitate the use of digital money to fully explore the possibilities of on-chain settlement. The benefits of on-chain settlement, and the role of digital money in achieving it, are set out below in the section on a digital payments leg solution.

[56] BoE, 'Bank of England policy on Operational Resilience of FMIs', (March 2021), available at: https://www.bankofengland.co.uk/paper/2021/bank-of-england-policy-on-operational-resilience-of-fmis

## Recommendations: Making a success of the Digital FMI sandboxes

| Who | Recommendation | Timeframe |
|---|---|---|
| FCA, BoE and HMT | **Look at lessons learned from the EU's DLT Pilot Regime and ensure that the UK FMI sandbox provides an attractive forum for firms to test new trading and settlement models**. Based on lessons from the EU's DLT Pilot Regime, the DSS should allow for digital money within its scope. The DSS should also provide appropriate incentives to attract participation from a wide range of firms. | Ongoing |
| The FCA and BoE | **Ensure that clearly defined criteria are set out on what is required for firms to be able to easily navigate the UK DSS requirements**. This will include having a single point of contact for participating firms. | Ongoing |
| The FCA and BoE | **Remain flexible and keep a strong dialogue with the industry** to understand practical issues such as development costs. Periodic review of the regime is important to evaluate the extent to which innovation is being supported. | Ongoing |
| The FCA and BoE | **Ensure that the projects that are progressed through the DSS do not introduce operational resilience risks that are not managed to a level consistent with the traditional FMIs.** | Ongoing |
| The FCA and BoE | **Continue to acknowledge that firms can use DLT outside the scope of the DSS.** | Ongoing |
| HMT | **Explore the possibility of an international dimension to a UK FMI sandbox/cross-border sandbox.** | H2 2025 |
| The FCA and BoE | **Create an industry forum for information sharing** that includes non-participant firms, to ensure transparency and representativeness of market participants when considering future regulatory guidance and policy changes. | H1 2025 |



## 2.3 A digital payments leg solution

The potential efficiencies of DLT and tokenisation can only be fully realised when the entirety of the transaction, including the payment leg, is carried out on the DLT (on-chain). While it is understandable that regulators want to ensure that any new forms of money do not cause financial instability, the DSS offers a controlled environment and regulators should proactively explore how to facilitate the digital payments leg.

Transactions to buy or sell an asset such as a security or a commodity carry a counterparty risk. These transactions typically involve two obligations:

- the seller's obligation to deliver assets (the asset leg)
- the buyer's obligations to pay for the assets (the cash leg/payments leg).

The 'cash leg' or 'payments leg' refers to the part of a trade where money is transferred, i.e. the money is delivered from the buyer to the seller in exchange for the assets. The seller wants to avoid a scenario where they sell the assets and do not receive the corresponding payment. The room for improvement in digitalised FMI is ensuring that the payment arrangements for the transfer of digital assets work well with the digital asset settlement system and do not introduce new risks. DLT-based infrastructure will need to address this when providing a solution.

### The issues to resolve

The DLT-based systems that currently exist do not provide for the two legs to occur truly simultaneously. These systems may transfer ownership of tokenised securities 'on-chain' – i.e. on the DLT – while the payment tends to occur off-chain and later, in a subsequent step, has to be represented on-chain. However, DLT offers significant benefits to the payments leg in resolving counterparty risk. When payment is off-chain, firms may still have to hold collateral for the possibility that the settlement fails. To unlock the true potential of DLT and see the benefits of the digitalisation of capital markets, there will need to be the ability to settle all elements of the transaction lifecycle on-chain.

On 30 July 2024, the BoE published a discussion paper on their approach to innovation in money and payments. This paper recognised DLT's potential benefits to wholesale markets and observed that "DLT-based transactions need a settlement asset that is compatible with DLT-based infrastructure."[57] Crucially, the BoE acknowledged the potential to use digital securities issued in the DSS as a "test case for exploring forms of payment that can interact with programmable securities platforms". To fully explore the benefits of DLT-based settlement, the DSS should explore solutions involving digital money. Those jurisdictions that offer this breakthrough facility as part of their DLT ecosystem

[57] BoE, 'The Bank of England's approach to innovation in money and payments', (July 2024), available at: https://www.bankofengland.co.uk/paper/2024/dp/the-boes-approach-to-innovation-in-money-and-payments

have the potential to leap ahead of others to become the leading global financial centres of tomorrow. In line with their respective competition and growth objectives, the FCA and the BoE should keep an open mind about the different forms of digital money settlement. In this regard, the BoE's participation in European Central Bank (ECB) trials involving digital cash solutions is welcome.

**Digital money settlement solutions**

There are several potential digital money solutions to bring the payments leg on-chain. Solutions include both private forms of digital money (largely issued by commercial banks, for example stablecoins and tokenised deposits) and public forms (issued by central banks, such as a CBDC).

- **Stablecoins:** Stablecoins are defined by the FCA as 'cryptoassets that aim to maintain a stable value relative to a specified asset, or basket of assets, providing perceived stability when compared to the high volatility of unbacked cryptoassets'.[58] Some have argued that a well-designed and appropriately regulated stablecoin could be an appropriate settlement asset for the payment leg of digital asset transactions. Many jurisdictions are taking steps to regulate stablecoins. At the forefront of this, in August 2023 Singapore's MAS finalised its new stablecoin regulatory framework.[59] The EU has also taken steps the bring stablecoins into its regulatory regime under its Markets in Crypto-Assets Regulation (MiCA), which creates a comprehensive EU regulatory framework for cryptoassets.[60] While the US does not have a regulatory framework for stablecoins, this is evolving.[61]

  In April 2024, in a letter to the European Commission updating them on the DLT Pilot Regime after its first year, the ESMA noted that DLT-based settlement is a technical possibility: "DLT market infrastructures can accommodate the use of cryptographically-secured settlement solutions".[62] However, the EU Pilot Regime has suffered from suffered from a misalignment in timing with MiCA. Authorisations under MiCA, which are necessary to enable firms to issue stablecoins, had not yet begun at the time.[63] Consequently, DLT Pilot Regime applications have not had access to firms issuing the stablecoins that they would need to execute the settlement of the payment leg of transactions on-chain. The DSS should take note of this and avoid such a misalignment with the regulation of stablecoins.

[58] FCA, 'Discussion Paper DP23/4 Regulating cryptoassets Phase 1: Stablecoins', (November 2023), available at: https://www.fca.org.uk/publications/discussion-papers/dp23-4-regulating-cryptoassets-phase-1-stablecoins
[59] MAS, 'Media Release: 'MAS Finalises Stablecoin Regulatory Framework', (August 2023), available at: https://www.sgpc.gov.sg/api/file/getfile/Media%20Release_MAS%20Finalises%20Stablecoin%20Regulatory%20Framework.pdf?path=/sgpcmedia/media_releases/mas/press_release/P-20230815-2/attachment/Media%20Release_MAS%20Finalises%20Stablecoin%20Regulatory%20Framework.pdf
[60] MiCA defines 'crypto-asset' as a 'digital representation of value or rights which may be transferred and stored electronically, using DLT (or similar technology)'; available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02023R1114-20240109
[61] For example, in April 2024, US Senators Cynthia Lummis and Kirsten Gillibrand introduced bipartisan legislation to create a regulatory framework for stablecoins, available at: https://www.congress.gov/bill/118th-congress/senate-bill/4155
[62] ESMA, 'DLT Pilot Regime Implementation', (April 2024), available a: thttps://www.esma.europa.eu/sites/default/files/2024-04/ESMA75-117376770-460_DLT_Pilot_Regime_-_Letter_to_EU_Institutions.pdf
[63] MiCA's rules for stablecoins took effect on 30 June 2024, whereas the DLT Pilot Regime was applicable as of 23 March 2023.



  The UK has the benefit of a good starting point on stablecoin regulation – in November 2023, the FCA and the BoE both published discussion papers on integrating fiat-backed stablecoins into the existing regulatory framework.[64] The government has not yet passed the necessary secondary legislation relating to fiat-backed stablecoins, however it has announced that stablecoins will form part of the comprehensive crypto regime. The FCA has also set out its 'Crypto Roadmap', confirming that it expects to issue a policy statement relating to stablecoins by Q1 2026.[65] While regulators' discussion papers were a positive step, their primary focus was on retail use cases, and the BoE position remains that "there are significant financial stability risks from the use of stablecoins for wholesale transactions".[66]

- **Tokenised deposits:** One issue with stablecoins, besides regulatory obstacles, is whether stablecoins will have the requisite market capitalisation to be able to settle transactions at scale. Tokenised deposits are a possible alternative. Tokenised deposits are deposit claims represented on DLT platforms. Project Agora, run by BIS, explores the tokenisation of commercial bank deposits on programmable platforms.[67] Tokenised deposits present a real opportunity to capitalise on pools of liquidity that will have the market capitalisation to be used on a wholesale basis and should be pursued by the UK. In this respect, it is encouraging that UK regulators are actively considering tokenised deposits. In November 2023, the PRA published a 'Dear CEO' letter, addressed to financial entities taking deposits, on innovations including stablecoins and tokenised deposits.[68] We welcome that the BoE has clarified that tokenised deposits can be used in the DSS.

- **Wholesale central bank digital currency (wCBDC):** A digital form of central bank money – or CBDC – is another potential alternative to stablecoins. Jurisdictions around the world are exploring wCBDCs. Notable examples include France, where the Banque de France has been experimenting with the use of a wCBDC for tokenised asset settlement using DLT.[69] Meanwhile, in November 2023 Singapore's MAS, which has been exploring the use of wCBDCs on DLT to

[64] The FCA defines fiat-backed stablecoins Fiat-backed as 'stablecoins that seek to maintain a stabilised value of the cryptoasset by reference to, and which may include the holding of, one or more specified fiat currencies'; FCA, 'Discussion Paper DP23/4 Regulating cryptoassets Phase 1: Stablecoins', (November 2023), available at: https://www.fca.org.uk/publications/discussion-papers/dp23-4-regulating-cryptoassets-phase-1-stablecoins; BoE. 'Regulatory regime for systemic payment systems using stablecoins and related service providers', (November 2023), available at: https://www.bankofengland.co.uk/paper/2023/dp/regulatory-regime-for-systemic-payment-systems-using-stablecoins-and-related-service-providers
[65] FCA, 'FCA Crypto Roadmap', (November 2024), available at: https://www.fca.org.uk/publication/documents/crypto-roadmap.pdf
[66] BoE, 'The Bank of England's approach to innovation in money and payments', (July 2024), available at: https://www.bankofengland.co.uk/paper/2024/dp/the-boes-approach-to-innovation-in-money-and-payments
[67] BIS, Project Agorá, (April 2024), available at: https://www.bis.org/press/p240403.htm
[68] PRA, 'Innovations in the use by deposit-takers of deposits, e-money and regulated stablecoins', (November 2023), available at: https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/letter/2023/november/innovations-in-the-use-of-deposits-emoney-and-regulated-stablecoins.pdf
[69] Banque de France, press release (July 2023), available at: https://www.banque-france.fr/fr/communiques-de-presse/la-banque-de-france-publie-un-second-rapport-pour-partager-ses-lecons-tirees-de-ses-experimentations

facilitate real-time settlement since 2016, unveiled plans to pilot wCBDC with local banks in a live setting in 2024.[70] The BIS Innovation Hub has successfully tested a cross-border wCBDC.[71] A 2021 BIS survey found that 86% of central banks are actively researching the potential for wCBDC use as a settlement asset; 60% were experimenting with DLT and related technologies; and 14% were deploying pilot projects.[72] This momentum is growing. The 2023 survey found there is now a greater likelihood that central banks will issue a wCBDC within the next six years than a rCBDC, and that 39-42% of central banks now envisage a potential wCBDC that is based on DLT.[73]

The BoE has reported a low-risk appetite for a significant shift away from settlement in central bank money towards private settlement assets, pointing to "a strong case for policymakers to take steps to preserve the role of central bank money as an anchor for confidence in the financial system."[74] The BoE is exploring innovations in central bank money to ensure this remains a viable settlement asset for DLT-based transactions, including a possible UK wCBDC. Should a wCBDC be issued, it would provide a payments leg solution that would be well-received by the industry. We note that the BoE has said in its DSS policy statement that it is unable to provide any indication of when a wCBDC might be viable The industry would, however, would welcome the Bank confirming that the development of this technology is now a priority. In any event, we note that realisation of a wCBDC will likely take an extended period of time, and alternative solutions should be developed in the meantime.

- **Real-Time Gross Settlement (RTGS):** RTGS systems are core infrastructure that allows for the instantaneous – or 'real-time' – transfer of money and/or securities. Given a wCBDC would take an extended period of time to develop, the regulators should consider the possibility of integrating the DSS with the existing RTGS system. Though not a DLT-based system, RTGS does involve digital central bank money. RTGS allows financial institutions to hold settlement accounts with the central bank and use central bank money to settle transactions. As central bank money is a low-risk asset[75], financial institutions can reduce settlement risk if they rely on central bank money.

[70] MAS, press release (November 2023), available at: https://www.mas.gov.sg/news/media-releases/2023/mas-lays-foundation-for-safe-and-innovative-use-of-digital-money-in-singapore
[71] BIS, 'Project Jura: cross-border settlement using wholesale CBDC' (December 2021), available at: https://www.bis.org/about/bisih/topics/cbdc/jura.htm
[72] BIS, 'Gaining momentum – Results of the 2021 BIS survey on central bank digital currencies', (May 2022), available at: https://www.bis.org/publ/bppdf/bispap125.htm
[73] 39% in advanced economies and 42% in emerging market and developing economies (World Economic Outlook classification of the International Monetary Fund (IMF)). BIS, 'Embracing diversity, advancing together – results of the 2023 BIS survey on central bank digital currencies and crypto', (June 2024), available at: https://www.bis.org/publ/bppdf/bispap147.htm
[74] BoE, 'The Bank of England's approach to innovation in money and payments', (July 2024), available at: https://www.bankofengland.co.uk/paper/2024/dp/the-boes-approach-to-innovation-in-money-and-payments
[75] The BoE states that *"RTGS allows commercial banks and certain other financial institutions to settle their obligations to each other electronically, immediately and using the ultimate risk-free asset – the deposits they hold with the Bank of England"*. Ibid, p18.



In the UK's RTGS system, the BoE provides accounts for regulated payment system operators known as "omnibus accounts". These already allow for innovative payment services – such as tokenised asset transactions – with the security of central bank money settlement. At a minimum, securities transactions on the DSS should be able to integrate with omnibus accounts and RTGS, rather than rely only on commercial bank money and private money. The Fnality payments system is an example of a digital ledger payments system that uses BoE omnibus accounts that could be made available.

## Potential digital money solutions to bring the payments leg on-chain

| Asset | Definition | Pros | Cons |
|---|---|---|---|
| **Stablecoins** | Cryptoassets that aim to maintain a stable value relative to a specified asset (e.g. fiat currency), or basket of assets. | Provides an on-chain, programmable payment solution that can interoperate with other tokenised assets. | Risk of its value deviating from par. The BoE has concerns about the financial stability risks in using stablecoins for wholesale transactions. |
| **Tokenised deposits** | Bank deposit claims which are 'tokenised' (i.e. represented on a distributed ledger). | A large pool of liquidity. Likely to be economically and fundamentally equivalent to 'traditional' deposits and therefore receive similar regulatory treatment. | Can only be provided by credit institutions. The BoE also has a lower financial stability risk appetite for such private forms of digital money compared to central bank money, in the context of wholesale transactions. |
| **wCBDC** | A digital form of central bank money designed for use in wholesale markets. | Offers the same trusted reliability as central bank money. Preserves the singleness of money[76], enables settlement finality, and reinforces the role of central bank money as an anchor in the financial system. May facilitate innovations in cross-border payments, noting that multiple jurisdictions are exploring the use of wCBDC. | May take time to develop, test and adopt new technologies. |
| **RTGS** | The Real Time Gross Settlement system – a core infrastructure supporting interbank settlement. | Immediate settlement. Lower financial stability risk as reliant on central bank money.<br>Note the BoE 'Synchronisation' project aimed at extending access for external ledgers to RGTS, in effect allowing tokenisation platforms to access central bank money without the need for a formal wCBDC. | Is not DLT-based and will need to be updated to allow for interoperability with DLT platforms – updates may take time (although the fundamental system is already well established). |

[76] The Bank views the singleness of money as crucial to monetary and financial stability. Under this principle, as defined by the BoE, "the different forms of money – whether we hold them in bank accounts, notes, or coins etc – must be exchangeable with each other at par value. In other words, the value of a pound in an individual's bank account must equal the pound coin in another individual's pocket." Ibid, p9.

**Interoperability**

Whatever solutions are adopted, they will need to take interoperability into account. Although systems already exist for transferring tokens within the same financial institution, it is harder to ensure interoperability between different financial institutions. However, BIS has proposed 'unified ledgers' as a solution.[77] BIS proposes a network of ledgers that are interoperable with each other through Application Programming Interfaces (APIs). These could integrate seemingly disparate asset classes into one common platform, from tokenised company shares to real estate. International progress is being made on this. In June 2024, the Monetary Authority of Singapore published a whitepaper introducing their GL1 initiative, which explores the development of a multi-purpose shared ledger infrastructure based on DLT.[78]

Another example of how the UK could lead the way in innovation in payments and interoperability is the UK Regulated Liability Network (RLN). UK Finance has worked with 11 financial institutions to test an interoperable platform for the settlement of existing commercial bank deposits, tokenised commercial deposits and central bank money.[79] This RLN is a form of FMI that leverages DLT, tokenisation and smart contracts on a shared ledger.

## Next steps

While discussion has already begun in the UK around how transactions can be settled on-chain including in the DSS, work on this needs to be accelerated. Where other key jurisdictions are currently leading the way on securities tokenisation, the UK can gain ground and unlock its own competitive advantage by further developing work on digital money and payment systems that support the payment layer for DLT-based systems for trading tokenised securities.

Firms will need certainty about what forms of digital money can be used for settlement. In the long term, firms will benefit from understanding the potential for a wCBDC. However, given that this realistically may not come to fruition until towards the end of this decade, it is necessary to have in place other feasible methods of on-chain settlement.

[77] BIS, 'Finternet: the financial system for the future', (April 2024), available at: https://www.bis.org/publ/work1178.htm
[78] MAS, ' Global Layer 1 One: Foundational Layer for financial Networks', (June 2024), available at: https://www.mas.gov.sg/-/media/mas-media-library/development/fintech/guardian/gl1---whitepaper.pdf
[79] UK Finance, 'UK Finance announces successful outcome of Regulated Liability Network Experimentation Phase', (September 2024), available at: UK Finance announces successful outcome of Regulated Liability Network Experimentation Phase

## Recommendations: A digital payments leg solution

| Who | Recommendation | Timeframe |
|---|---|---|
| HMT, FCA and BoE | **Provide further clarity on the regulatory treatment of stablecoins.** Clarity is starting to form, but there is still some way to go and there remain concerns about its suitability for settlements of wholesale transactions. | H1 2025 |
| HMT | **Consult further on barriers to adopting tokenised deposits and provide the regulatory clarity to unlock huge investment in the UK.** | H1/H2 2025 |
| HMT | **Set up an industry taskforce to determine the appropriate arrangements to enable the interoperation of the operational and legal ecosystems for digital FMIs.** | H1 2025 |

# 3. Digital bonds under the microscope

## 3.1 Adoption of digital bonds

With key reforms coming through such as the DSS and the evolving regulatory regime for cryptoassets, the UK is taking some positive steps to encourage a regulatory environment that supports the digitalisation of financial markets. However, there is a serious risk that the UK is falling behind others in a number of respects and the UK's shortage of digital bond issuances illustrates this point well. There are significantly more digital bond issuances in the EU than in the UK. To our knowledge, the first wholly English law governed native DLT Bond was issued in 2024,[80] whereas in the EU issuances have been ongoing for several years.

- The European Investment Bank (EIB), the EU's investment Bank, has been at the forefront of digital bond issuance, issuing its first digital bond in April 2021. In 2023 the EIB issued its first digital bond denominated in Sterling,[81] and by the end of 2024 the EIB had carried out six digital bond issuances totalling over $550million. The EIB's pioneering work, together with initiatives developed by the ECB, banks and regulators in relevant EU jurisdictions, have signalled the EU's openness to integrating DLT into traditional financial practices. The Eurosystem and the ECB have been catalysts driving innovation to support tokenisation in Europe; their DLT settlement trials from May to December 2024 encompassed over €1.59bn of DLT transactions.[82]
- In Asia, Singapore and Hong Kong are also positioning themselves as leaders in digital bond issuances, with Hong Kong issuing its latest digital green bond for $756m through the CMU in February 2024.[83]

It is noteworthy that there have been some English law governed digital bond issuances in other jurisdictions, demonstrating that there is appetite to rely on English law internationally.

- In September 2024, HSBC issued a HK$1bn ($128m) one year digital bond under English law using the HSBC Orion DLT platform on the Hong Kong Stock Exchange (HKEX).[84]
- In August 2024, the Asian Infrastructure Investment Bank (AIIB) issued a digitally native USD note on Euroclear's D-FMI platform, raising US$300m as part of an overall $500m digital issuance programme for the AIIB's sustainable development programme.[85]

[80] Hogan Lovells, Press release (April 2024), available at: https://www.hoganlovells.com/en/news/hogan-lovells-advises-on-issuance-of-native-digital-bond-governed-by-english-law-and-issued-on-a-public-blockchain

[81] European Investment Bank, 'EIB issues its first ever digital bond in pound sterling', (January 2023), available at: https://www.eib.org/en/press/all/2023-030-eib-issues-its-first-ever-digital-bond-in-british-pounds

[82] European Central Bank, 'Eurosystem completes tests using DLT for central bank money settlement' (December 2024), available at: https://www.ecb.europa.eu/press/intro/news/html/ecb.mipnews241204.en.html

[83] The Banker, 'Being the bank for Hong Kong's first corporate digital bond', (December 2024), available at: https://www.thebanker.com/Being-thebank-for-Hong-Kong-s-first-corporate-digital-bond-1734966400; In November 2024, the Hong Kong Monetary Authority also launched a 'Digital Bond Grant Scheme' under which issuers may receive a contribution towards the expense of digital issuance, available at: https://www.hkma.gov.hk/media/eng/doc/key-functions/ifc/bond-market-development/Guideline_on_the_Digital_Bond_Grant_Scheme.pdf

[84] ibid.

[85] Euroclear, 'Asian Infrastructure Investment Bank issues its first DNN', (August 2024), available at: https://www.aiib.org/en/news-events/news/2024/AIIB-issues-its-first-digitally-native-note-on-Euroclears-D-FMI-platform.html

### Recent key milestones in the global adoption of DLT bonds

1. February 2024 – **Hong Kong** government issues largest ever DLT bond, a $756m digital government green bond.
2. April 2024, **BIS Innovation hub Project Agora** (Bank of England is a member) to explore multi-currency unified ledger for tokenised commercial and wholesale cross border payments.
3. May 2024 – **World Bank** issues first Swiss digital bond ($220m) to be settled in wholesale CBDC by Swiss National Bank.
4. May – December 2024, **Eurosystem** processes €1.59bn ($1.65bn) in ECB's DLT Settlement trials.
5. July 2024, **Slovenia** issues first EU sovereign digital bond (€30m).
6. August 2024, the **Asian Infrastructure Investment Bank** issues its first digital bond (equivalent $300m) as part of its sustainable bond program.
7. September 2024, **HSBC** issues HK$1bn ($128m) digital bond under English law on its Orion DLT platform on the **Hong Kong Exchange.**
8. September 2024, **Siemens** issued a €300m digital bond ($311m) under the German Electronic Securities Act, using the German Bundesbank's Trigger Solution, to trigger a central bank money payment on the Target 2 system.
9. November 2024, **Monetary Authority of Singapore's Project Guardian** (FCA is a member) reports, in collaboration with GFMA and ICMA, on cross border fixed income tokenisation initiatives.
10. November 2024, **European Investment Bank's** fifth and sixth digital bond issuances (€100m each) using Banque de France's wholesale CBDC for settlement. At December 2024, EIB has issued over $550m in digital bonds (in Euros, Pound Sterling, and Swedish Krona).

Bonds are critical to capital markets and digital bonds represent a large proportion of the tokenised securities market to date, as documented in the 'Tracker of New FinTech Applications' maintained by the International Capital Markets Association.[86] Therefore, vitality in the digital bond space is a good bellwether for the state of adoption more broadly.

As mentioned, there are ongoing barriers to entry in the UK. On the investor side, innovative technologies such as DLT lead to increased costs (despite the ultimate promise of cost efficiencies) owing to IT re-platforming, the need to overcome compliance uncertainties and carry out additional due diligence on something that is unfamiliar and new. Coupling this with the current lack of scale in primary issuance and no properly functioning secondary market, the drawbacks currently outweigh the benefits for many investors. To invest the necessary time and money to experiment with tokenisation and DLT-based innovations, the market needs confidence that digital solutions can and will be scaled in the UK. While signals of ambition in the UK are welcome, the UK government and industry stakeholders can take further coordinated steps to support tokenisation and demonstrate long term commitment to capital markets modernisation.

## 3.2 Demonstrating UK confidence in DLT

Market concerns could be overcome by high-profile use cases demonstrating confidence in the technology, creating replicable pathways to issuance, reducing the associated cost and increasing transparency around issuing and investing in securities tokenisation. Therefore, the industry has warmly welcomed HMT's commitment to issue a Digital Gilt Instrument (DIGIT) in the DSS. This is a positive start, but given the increase in sovereign issuances elsewhere, the UK must swiftly take steps to implement this.

Many of the jurisdictions that are ahead of the UK in experimenting with and piloting digital bond issuances have benefited from state-led initiatives. For example, in July 2023 Italy's state-owned bank, Cassa Depositi e Prestiti SpA (CDP), completed a €25m digital bond issuance. This was part of a trial launched by the ECB to identify new solutions for central bank money settlement of wholesale transactions carried out on DLT. UK policymakers can take note of lessons learned from other jurisdictions to catch up and potentially gain ground. A pound sterling digital gilt would send a signal that the UK is committed to tokenisation and could demonstrate a clear pathway to the issuance and trading of digital bonds under English law. This would enhance market confidence and could be designed to encourage wider industry participation, including in secondary markets, and attract greater investment into the UK.

[86] ICMA, `Tracker of New FinTech Applications', available at: https://www.icmagroup.org/fintech-and-digitalisation/fintech-resources/tracker-ofnew-fintech-applications-in-bond-markets/; Note that this tracker provides helpful transparency but does not claim to be comprehensive.

There is a narrowing window of opportunity to show global leadership here. In July 2024, as part of the ECB wholesale central bank money settlement experimentation program, the Republic of Slovenia became the first EU nation to do this, with the issuance of a €30m sovereign bond on DLT. This transaction, which BNP Paribas coordinated, was settled on-chain through the Banque de France's tokenised cash system. Both the concept and the method have been proven. The international landscape is moving quickly – in November, the French Caisse des Dépôts et Consignations (CDC) issued a €100m digital bond. To maintain UK competitiveness, the UK DIGIT pilot must make significant progress in 2025.

Both UK Finance and the Association for Financial Markets in Europe (AFME) have provided detailed implementation roadmaps.[87] In considering these, the government should ensure that the DIGIT timeline and project sequencing are premised on equipping the secondary market use cases, repurchase agreements (repos) and collateral mobility, and how the UK can expedite this progress, for example by layering tokenisation over conventional systems.

If the government pursues the reported 18-24 month timeframe, it must ensure the result is comprehensive and impactful. Several design choices will need to be made around this issuance, and HMT must work with the industry to determine how a DIGIT issuance can best harness the UK's 'second-mover advantage.' With this longer timeframe, there is an opportunity to pursue an ambitious approach that reflects features in the more mature 'phase 3' design that UK Finance has proposed.

There are also clear opportunities for digital capital markets leadership given the evolution of new public-private partnership models, including the government's new £7.3bn National Wealth Fund (NWF) which seeks to attract £3 of private investment for every £1 of public funding by sharing risks and providing confidence to investors. The government could explore the possibility of encouraging tokenised securities activities amongst private sector participants in the NWF, including by tokenising investment instruments and offering incentives, such as enhanced functionality in respect of real-time tracking and reporting, for investors to select tokenised options.[88] The government could also explore the potential benefits of using digital green bonds in the context of the NWF, including for purposes of mitigating greenwashing or achieving environmental purpose outcomes, as identified earlier in this report. Integrating tokenisation into the NWF could both catalyse private sector innovation and increase the efficacy of the fund to deliver impact from its green projects.

[87] UK Finance, 'Digital Gilt Roadmap' (April 2024), available at: https://www.ukfinance.org.uk/policy-and-guidance/reports-and-publications/uk-finance-digital-gilt-roadmap; AFME, 'Scaling DLT-Based SSA and Government Bond Markets - A Roadmap Strategy for European Issuers' (June 2024), available at: https://www.afme.eu/publications/reports/details/scaling-dlt-based-ssa-and-government-bond-markets---a-roadmap-strategy-for-european-issuers

[88] The government could, for example, explore incentivising domestic digital issuance by making any guarantees to the private sector for covered bonds under the NWF contingent on DLT-based issuance.

In order to build confidence, the government should set out a clear policy vision which supports the development of market standards, market infrastructure and wider policy initiatives aimed at establishing longer-term confidence in the government's policy support for digitalised capital markets.

The government could convene industry groups in the UK to establish very clear pathways to facilitate the issuance of digital bonds, for example by developing a shared structural understanding, open-source term sheets, and a standard investor due diligence checklist. This work should focus on the bearer-like issuance as well as the registered offering.

Government and industry stakeholders should work with international bodies to establish common/interoperable standards for pathways to digital bond issuance, custody and transfer.[89]

## 3.3 Legal frameworks

Governments around the world have been reviewing and adapting their legal frameworks to accommodate digital bonds. For example, there have been recent efforts across the EU to adapt legal frameworks to support securities tokenisation, with some national jurisdictions, such as Italy and Spain, introducing new legislation and others adapting existing laws.

There have been some positive developments in the UK designed to add to legal certainty. In February 2023, the UKJT[90] published a legal statement on the issuance and transfer of digital securities under English private law. This concluded that there is already sufficient flexibility within English private law to facilitate the issuance of digital bonds, without the need for further statutory intervention:

> ***"[We] see no difficulty in principle in Digital Securities (whether debt, proprietary or equity securities) being issued, by UK or foreign companies, and governed by English law, using a blockchain or DLT-based system. The relevant legal features of traditional (paper based or registered) securities can be replicated by the use of appropriate legal structuring techniques. Certain legal formalities and requirements may need to be complied with by UK companies, depending on the precise model, but generally these can be met through electronic means."***

[89] ICMA has been working on promoting best practices and common standards including building on its Bond Data Taxonomy and publishing a DLT bonds reference guide (December 2024), available at: https://www.icmagroup.org/fintech-and-digitalisation/fintech-advisory-committee-and-related-groups/bond-data-taxonomy/

[90] The UKJT is a part of LawtechUK, an industry-led group tasked with supporting the digital transformation of the UK legal services sector and with positioning English law as a law of choice for new technologies assets, distributed ledger technology, smart contracts and associated technologies under English law. https://lawtechuk.io/our-reports/



The conclusions of the UKJT statement were largely endorsed by The Law Commission, which was tasked by the government to make recommendations for reform to ensure that English law is capable of accommodating digital assets in a way that allows the possibilities of this type of technology to flourish. The 2023 Law Commission report concluded that the common law system in England and Wales is "well placed to provide a coherent, globally relevant legal regime for existing and new types of digital asset".[91] The courts have also been supportive, finding that digital asset holders have enforceable property rights in a chain of cases going back several years. A supplementary Law Commission report (July 2024) proposed a short two clause bill to confirm in statute that digital assets such as cryptocurrencies are capable of attracting property rights even if they do not fall into existing categories of personal property.[92] The UK government has acted on the recommendation of The Law Commission to remove any residual uncertainty by introducing the Property (Digital Assets Etc.) Bill into the House of Lords and appointing the UKJT to provide guidance on control of digital assets.[93]

Nonetheless, to date some market participants have been hesitant in the uptake of English law governed digital assets. When we compare the English law system to others where issuances have been more concentrated, there are certain marked differences. For example, in Luxembourg the issuance of dematerialised securities has been permitted since 2013 and, since 2021, with the use of DLT specifically covered. More recently, in December 2024, Luxembourg adopted a further law that will update three of Luxembourg's finance laws to offer greater flexibility and legal certainty and improve the ease of use of DLT in the issuance, holding and transfer of tokenised securities.In France, bond dematerialisation occurred in the 1980s and several DLT issuances have been carried out to date under French law, taking advantage of this flexibility.

However, in the UK there is no specific law or universally adopted practice around dematerialisation for English law governed instruments. Some bonds are issued in dematerialised form, but others continue to be created using a paper global note at the heart of the issuance. Gilt securities available to retail investors have until very recently only been available in physically certificated form. There are also multiple structural options for bonds, including registered bonds and bearer bonds, which create further nuances in the approach. Some countries have taken steps to phase out bearer instruments, for example the US market stopped issuing bearer bonds in 1982 and, since 2014, Belgian law has

[91] Law Commission, 'Digital assets: Final report', (June 2023), available at: https://lawcom.gov.uk/project/digital-assets/

[92] Law Commission, 'Digital assets as personal property – supplemental report and draft legislation', (July 2024), available at: https://lawcom.gov.uk/digital-assets-as-personal-property-supplemental-report-and-draft-legislation/; See also Law Commission paper on Digital Assets in Private international law, January 2025, available at: https://cloud-platform-e218f50a4812967ba1215eaecede923f.s3.amazonaws.com/uploads/sites/30/2025/01/Digital-assets-in-private-international-law-FAQs.pdf

[93] Justice Minister Heidi Alexander's statement to the House of Commons on the Government's response to the Law Commission report on digital assets (September 2024), available at: https://hansard.parliament.uk/commons/2024-09-11/debates/24091116000012/LawCommissionDigitalAssetsReportGovernmentResponse

mandated that any bearer securities be automatically converted to registered or dematerialised form. However, under the EU DLT Pilot Regime digital bonds are specifically permitted to be in bearer form. This is important because while some countries have phased out bearer bonds, in others such as France and Germany the majority of bonds continue to be issued in this manner.

Given the direction of travel in other jurisdictions, the UK DLT-based market needs to remain available to respond to dematerialised bonds, including those that have the characteristics of 'bearer' and 'registered' forms. At present, providing cost-attractive entry points with certainty around primary issuance mechanisms and liquid secondary trading functionality are hurdles that digitised UK debt capital markets need to overcome.

### Collateral

Another key point relating to collateral holding arrangements and collateral eligibility. This is an important 'use case' challenge because the value that investors ascribe to the securities they hold can be significantly increased if those instruments can be used as financial collateral and treated as eligible collateral by the central bank – i.e. as a liquidity access tool for institutions. The current lack of collateral eligibility for certain digital securities is a significant market barrier to adoption and is preventing scaled investment. Opening up collateral eligibility criteria to ensure that DLT bonds can play these key roles for institutional financial management purposes requires the active pursuit of a technology-neutral approach by the BoE and the FCA. Further clarity in this respect should significantly improve demand and liquidity in the DLT bond space on the investor side.

A positive development of the DSS is that certain digital securities issued within the sandbox can be used as collateral in various financial transactions.[94] However, an urgent solution is needed for digital securities outside of the DSS.[95] The Law Commission has recommended that statutory intervention could be used to (i) clarify that certain digital securities models fall within the scope of the existing Financial Collateral Arrangements (No.2) Regulations (FCARs) and (ii) provide a framework for collateral arrangements of tokenised assets outside of FCARs' scope.

We support recommendations set out in UK Finance's July 2023 paper 'Unlocking the Power of Securities Tokenisation'[96] regarding the treatment of collateral. For instance the report recommended that the government should, in line with The Law Commission, work with the BoE to provide greater statutory clarity on the digital securities models that already fall within the scope of existing collateral regulations, and provide a statutory framework for collateral arrangements not currently provided for under existing regulations. We also support the related recommendation in that report regarding the regulatory treatment of digital assets as eligible collateral or high-quality liquid assets. We understand that HMT is currently reviewing those recommendations.[97]

## 3.4 Tax

While tax is not the focus of this report, it is important to note there are tax barriers to scaling digital bonds in the UK. In particular:

- **Quoted Eurobond exemption:** Many UK-based issuers rely on the quoted Eurobond exemption to ensure that payments on bonds are not subject to UK withholding tax. For that exemption to work, the bonds must be admitted to trading on a relevant market. However, the CSDR requires bonds to be cleared through a recognised CSD for them to be eligible for admission to trading on EU and UK regulated markets and Multilateral Trading Facilities (MTFs). Many DLT platforms are not operated by a recognised CSD, limiting the volume of digital bonds that can be admitted to trading.
- **Stamp duty:** In the UK, stamp duty applies to the transfer of paper securities, while stamp duty reserve tax (SDRT) applies to digital transfers. HM Revenue and Customs (HMRC) have recognised the need to rectify this and plans to replace stamp duty and SDRT with a single tax on securities. However, the stamp duty/SDRT analysis becomes complicated where certain types of bonds are not issued in a traditional manner through a recognised clearing system. In a worst-case scenario, there would be potential stamp duty/SDRT charges upon the issuance and any transfer of digital bonds.

Given the direction of travel, elements of the UK tax regime need to be updated to ensure they can accommodate digital bonds. While, under FSMA 2023, the government has the power to make permanent changes to legislation based on what is learned from the DSS, tax legislation is currently not within scope. A clear and competitive tax regime is key to attracting investment in the UK tokenised securities market broadly. The government should review the way in which the current wholesale tax regime interacts with tokenised securities.

[94] For example, the BoE confirms in its policy statement that tokenised units of money market funds can be used as collateral: paragraph 3.43 of the Bank of England and FCA joint approach to the Digital Securities Sandbox | Bank of England. Available at: https://www.bankofengland.co.uk/paper/2024/policy-statement/boe-fca-joint-approach-to-the-digital-securities-sandbox

[95] For instance, the BoE has said in paragraph 8.5 of its policy statement on the DSS that digitally native securities are not currently eligible as collateral under the Sterling Monetary Framework. However, it notes that "the Bank continues to monitor market developments" and encourages the case to be made by industry, including in response to the Discussion Paper on Innovation in Payments.

[96] UK Finance, 'Unlocking the Power of Securities Tokenisation', (July 2023), available at: https://www.ukfinance.org.uk/policy-and-guidance/reports-and-publications/unlocking-power-securities-tokenisation

[97] See final paragraph of Justice Minister Heidi Alexander's statement to the House of Commons on the Government's response to the Law Commission report on digital assets (September 2024), available at: https://hansard.parliament.uk/commons/2024-09-11/debates/2409116000012/LawCommissionDigitalAssetsReportGovernmentResponse

## Recommendations: Digital bonds

| Who | Recommendation | Timeframe |
|---|---|---|
| HMT | **Establish the UK as a leader by taking swift, concrete steps toward issuing a pound sterling digital gilt.** | Immediate |
| HMT | **Leverage the opportunities presented by the National Wealth Fund** to incentivise private sector investment in tokenisation. | Ongoing |
| Industry, regulators and policymakers | **Work with the industry to develop market standards, market infrastructure and wider policy initiatives, to establish longer-term confidence in policy support for digitalised capital markets.** | Begin in H1 2025; Ongoing |
| HMT and industry | **Convene industry groups in the UK to establish very clear pathways to facilitate the issuance of digital bonds**, e.g. a shared structural understanding, open-source term sheets, and a standard investor due diligence checklist. This work should focus on the bearer-like issuance as well as the registered offering. | Ongoing |
| HMT and industry | **Work with international bodies to establish common / interoperable standards for pathways to digital bond issuance, custody and transfer.** | Ongoing |
| HMT and BoE | In line with the recommendations from The Law Commission, **provide regulatory and statutory clarity on collateral arrangements and the collateral eligibility of digital securities.** | H1 2025 |
| HMT | Review how the current **wholesale tax regime** interacts with tokenised securities. | H1/H2 2025 |



# Conclusion

The continued success of UK capital markets is essential to fulfilling the government's central mission for economic growth, the FCA and PRA's secondary international competitiveness and growth objective, and the Bank of England's secondary objective to facilitate innovation in FMI. While positive reform is already underway to protect the long-term competitiveness of our capital markets, further steps are needed to modernise them. As other key jurisdictions are already taking the lead in leveraging technologies to transform and improve the traditional delivery of financial services, the UK risks becoming outdated.

The digitalisation of FMI through DLT presents significant opportunities for the UK to enhance the efficiency of our capital markets and ensure their long-term international competitiveness. As the financial landscape continues to evolve, technologies like DLT will provide cheaper, faster, more transparent, programmable and accessible financial services. However, to fully realise these benefits, the UK must take further steps to overcome challenges associated with ecosystem adoption and stand out as an attractive destination for tokenisation. While other judications have already shown leadership in DLT and tokenisation, the market is still nascent and the UK has an opportunity to seize a 'second-mover advantage' in its DIGIT issuance. A window of opportunity remains for the UK to learn from the experiences of other jurisdictions that have taken steps, to catch up and potentially overtake.

This report has identified a number of priority steps that can facilitate the urgent digitalisation of UK FMI in the following areas: (a) industry-led initiatives; (b) regulatory sandboxes; (c) digital payments; and (d) digital bonds. Industry standards and interoperability are essential to support the widespread adoption of DLT-solutions. The UK must learn lessons from the EU Pilot Scheme and make a success of the DSS to create a competitive regulatory environment for tokenised securities, and further develop digital payment systems to support securities trading on DLT. Finally, the government must continue its welcome approach to catalysing industry innovation.

Building on the recommendations given in this paper policymakers, regulators and the industry should continue to work together to embrace innovation and take the necessary steps to create modern, digital capital markets and make the UK a global hub for securities tokenisation.

Well-functioning capital markets are the power engine of the UK. Their continued international competitiveness is vital to deliver the capital needed for investment and growth, finance the net zero transition, and underpin the jobs, pensions, investments and savings of UK citizens. To ensure they can continue to fulfil this function, there must be urgent action to embrace digitalisation and future-proof the UK's capital markets for an increasingly digital global economy.

# Annex: Definitions

| | |
|---|---|
| **Central bank money** | Money provided by a central bank to the public through cash and to banks and other financial companies through reserve and settlement accounts. |
| **Central bank digital currency /CBDC** | A digital form of central bank money. |
| **Commercial bank money** | A private form of money that can be transferred by companies using central bank infrastructure. |
| **Cryptocurrency** | A crypto-asset that is designed to function like money, as a store of value. Unlike cash it is not controlled by a central bank or government. Unlike a stablecoin, a cryptocurrency is not backed by a stable asset. |
| **Dematerialisation** | The elimination of paper-based processes and physical certificates of financial instruments, such as shares and bonds. Typically, this involves stopping/replacing all paper issuances by creating title to securities solely by way of entries in a ledger. |
| **Digital asset** | A digital representation of a value or of a right. |
| **Digital bond** | A bond which uses distributed ledger technology for all or part of its life cycle. It includes tokenised bonds (digital representations of traditional bonds) and digitally native bonds (issued directly on a distributed ledger). |
| **Digital Securities Sandbox** | A legal framework in the UK that facilitates trade in certain digital securities (with some modifications to the legal regime). |
| **Distributed ledger** | A ledger made up of multiple 'nodes' on which transactions are simultaneously recorded; there is no central record but rather the record sits on multiple nodes which are synchronised on an ongoing basis. Blockchain is an example of a distributed ledger. |
| **Distributed Ledger Technology (DLT)** | Technology that enables the operation and use of distributed ledgers. |
| **European Central Bank (ECB)** | European Central Bank, responsible for conducting monetary policy of the Euro Area. |
| **Eurosystem** | The network of national central banks in the Eurozone together with the European Central Bank. |
| **European Investment Bank (EIB)** | The European Investment Bank is the bank of the European Union and one of the biggest multilateral banks in the world. |
| **A fiat currency** | Money that is backed by government rather than by a physical asset, such as gold. |
| **Immutability (of records on a distributed ledger)** | DLT records are said to be immutable as they cannot generally be modified or removed once added to a distributed ledger. |
| **Interoperability** | The ability of two or more systems or applications to 'speak to each other' (to exchange information and to mutually use the information that has been exchanged.) This could relate to interoperability of two or more DLT systems or the interoperability of DLT and traditional systems. |
| **Operational resilience** | The ability of firms, financial market infrastructures and the financial sector to prevent, adapt and respond to, and recover and learn from operational disruption. |
| **Smart contract** | A contract (or part of a contract) which is performed automatically without the need for human intervention. Smart contract terms are recorded in machine-readable form, i.e., in code, and can be embedded a distributed ledger. |
| **Stablecoin** | A form of digital asset that can be used to make payment and which aims to maintain a stable value relative to a specified asset (e.g., fiat currency), or basket of assets. |
| **Token** | A digital representation of an asset or ownership of an asset. |
| **Tokenisation** | The process of digitally representing an asset or ownership of an asset as a token on a distributed ledger. |
| **Tokenised deposit** | A token which represents a bank deposit (i.e., a claim to cash). |
| **UNIDROIT** | International Institute for the Unification of Private Law. |
| **Wholesale central bank digital currency (wCBDC)** | A digital form of central bank money for use in wholesale markets. |

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