

The first digital gilt to use blockchain technology

Charlotte Hill, Mayad Rassam from Vedanta Hedging

On 14 November 2024, the Chancellor of the Exchequer announced in her Mansion House speech that the government will issue a digital gilt instrument, known as 'DIGIT'. This pilot issuance will take place within the newly established Digital Securities Sandbox (DSS). These initiatives aim to allow the government to explore the benefits of distributed ledger technology (DLT), including blockchains, in the debt issuance process and stimulate the broader development of DLT platforms and infrastructures across UK capital markets.

The digital gilt, expected to be launched within two years, marks the first time the UK will use blockchain for bond issuance, however specific details of the bond have not yet been announced. This initiative should aim to leverage the transparency, security, and efficiency of blockchain technology to modernise the process of gilt issuance and management.

This article will delve into the UK government's trial of using blockchain as a register for gilt issuance, along with the background of blockchain technology and its potential financial, legal, and regulatory implications.



History and background of gilts

Gilts are government bonds issued by the UK government, serving as a means for it to borrow money to fund its budget and projects. Each gilt is issued with a coupon rate and a maturity date; for example, the [4¼% Treasury Gilt 2034](#) was issued in June 2024 as a 10-year fixed maturity bond, paying an annual coupon of £4.25 for each £100 notional bond value.

The history of Britain's bond issuance began in 1694, when King William III asked the recently formed Bank of England (BoE) to gather a little over 1,000 individuals to subscribe to buy £1.2 million of gilts yielding 8%, designed to fund the war with France. The bonds became known as gilts because the certificates had gilt edges to them.

Today, the United Kingdom Debt Management Office (DMO) is the executive agency responsible for debt and cash management for the UK government. The DMO took over gilt issuance from the BoE, following the transfer of responsibility for setting interest rates from HM Treasury in May 1997.

The history of gilt registers

With the issuance of the first gilt, the 1694 Charter stipulated that a register of assignments and transfers in its bonds be kept at the BoE. This duty fell on the accountant's department, later called the Registrar's Department. The Registrar's Department survived until December 2004 when it closed, and the gilt ledger and record keeping was taken over by Computershare Investor Services Plc.

Gilt registration involves issuing the gilts, recording ownership, recording changes of ownership, ensuring transactions are legitimate, and paying dividends.

The register of gilt holdings is currently maintained by Computershare. It is responsible for the administration of the DMO's gilt purchase and sale service. Since the early days of gilt issuance, registers have been essential for keeping track of ownership. Over time, the process evolved from paper based to computerised registers, which offered enhanced security and efficiency. Today, these registers are protected with advanced encryption technologies, ensuring the integrity and confidentiality of ownership records.

The Digital Securities Sandbox (DSS)

With the introduction of the UK's DSS, launched officially on 30 September 2024, the opportunities now exist for regulated activities to be conducted using new innovations in technology, such as DLT and blockchains. The DSS was launched jointly between the BoE and the Financial Conduct Authority (FCA). This joint initiative looks to promote technology innovation in the financial markets, within a regulated environment. The DSS follows several other international initiatives, such as the European Blockchain Partnership (EBP) – the European Union's framework that resulted in the creation of the European Blockchain Services Infrastructure (EBSI). EBSI is a cutting-edge blockchain network designed for a multitude of public services, not specific to financial instruments.

The DSS represents a new model for trading and settlement in the UK. Currently, the post-trade environment involves numerous manual steps over an extended period, engaging multiple entities. This process is both time-consuming and cumbersome, introducing elements of settlement and credit risk. New technologies like DLT have the potential to streamline these processes, reducing the number of intermediaries, systemic risks, and associated costs. This would result in a system that is safer, cheaper, and more efficient. However, as explored below, existing legislative and regulatory requirements hinder market participants from adopting these new technologies.

The purpose behind the DSS is to enable the government and regulators to test new technologies in a real-life scenario subject to a modified regulatory regime for a limited period, and then make changes on a permanent basis.

The DSS itself is not a technology, but a legal and regulatory framework within which entrants can adopt innovations in technology, such as blockchains.

The DSS guidelines have not set out whether the use of blockchains in the sandbox should be permissioned or permissionless, leaving the potential for either of those to be adopted by participants within the sandbox.

Background on blockchain and DLT

Distributed ledger technology refers to digital systems for recording and verifying transactions, authentications and interactions across a network of computers, rather than a single central authority. DLTs have gained traction due to their potential for enhanced security, transparency, and efficiency in record-keeping.

Blockchains are one type of DLT used to record transactions securely. While often associated with cryptocurrencies like Bitcoin, blockchains are distinct technologies. In the context of gilts, a blockchain digital ledger will serve as a secure register of ownership and transactions.

How blockchains work

Cryptography ensures the security and integrity of data on the blockchain. It uses complex mathematical algorithms to encrypt data, making it nearly impossible for unauthorised parties to alter or tamper with the information. This is essential for maintaining trust in the blockchain network.

Digital signatures are used to authenticate users and verify transactions.

Immutability of the blockchain is achieved with cryptography. Once data is recorded in a block, it is linked to the previous block through a cryptographic hash. Any attempt to alter the data would change the hash, making the tampering immediately detectable. **This is the key idea behind blockchains.**

Distributed record-keeping relies on consensus to verify authenticity. At its simplest level, if the ledger is distributed across 1,000 different internet servers, consensus of 51% or more is achieved when looking up a record in the ledger. A bad actor would need to successfully attack more than 500 different internet servers in this example, to corrupt the ledger records.

Permissioned v permissionless blockchains

Blockchains generally come in two types: permissionless and permissioned. The key difference lies in whether the blockchain is open for anyone to participate (permissionless) or restricted to designated participants (permissioned).

Permissionless blockchains, also known as public blockchains, are open networks accessible to everyone. They are fully decentralised, with transactions and data validated by unknown participants. This openness enhances transparency and security but lacks confidentiality.

In contrast, **permissioned blockchains**, also known as private blockchains, are closed networks where only pre-approved parties, often members of a consortium, can interact and participate in consensus and data validation. These blockchains are partially decentralised, being distributed across known participants rather than unknown ones.

Suitability of blockchains

Digital gilts are significant because government bonds play a crucial role not only in funding government expenditure, but also as foundational elements of financial markets. A key advantage of a token-based digital asset ecosystem is the ability to move assets used as collateral more quickly and efficiently. Since government bonds are often used as collateral, any meaningful test of a tokenised market infrastructure should incorporate them.

Digital gilts can already be created synthetically by market participants. A participant could purchase a gilt, tokenise it, and then sell these asset-backed tokens to customers. However, this approach removes one of the primary attractions of government bonds: the direct security provided by the government issuer.

By issuing its first digital gilt, the DMO is demonstrating a strong commitment to adopting this new technology.

The transition to blockchain for gilt issuance seeks to improve transparency, security, and speed. Although blockchain technology provides theoretical and mathematical security, its practical implementation can be intricate. The effectiveness of blockchain as a ledger for gilts will hinge on its ability to fulfil these promises without introducing new vulnerabilities. As technology and AI continue to evolve, it will be essential to maintain control and a thorough understanding of these systems.

Blockchain technology has the potential to revolutionise the financial industry by providing a secure, transparent, and efficient way to manage transactions and records. It is already playing a role in smart contracts. **Smart contracts** are self-executing contracts with the terms of the agreement directly written into code. They automatically enforce and execute the terms of the contract when predefined conditions are met. In the context of gilts, smart contracts could automate the issuance, transfer, and redemption processes, further reducing the need for intermediaries and increasing efficiency.

As explained above, existing legislative and regulatory requirements in the UK often deter market participants from adopting these new technologies.

Legislative barriers

It is important for the law to treat digital assets as a form of property to ensure that we know how one can legally deal with the asset, and to obtain the necessary protections should something go wrong and the asset is mistreated, or stolen, for example. While the English courts have been willing to accept that digital assets are to be treated as a form of 'property' since 2019 (following non-binding guidance from the UK Jurisdiction Taskforce), there is currently no legislation which comprehensively deals with this nascent technology.

As a result, as and when any issue has arisen about the new asset class, owners of the same have had to litigate through the English courts to obtain assistance – something which is both time consuming and costly. Market participants have therefore often been reluctant to invest in the industry and to develop products out of the UK due to the uncertainty as to how digital assets are to be treated.

The UK government has now however published draft legislation that is progressing through the House of Lords to assist. The Property (Digital Assets etc.) Bill is a UK bill that was introduced in September 2024 which aims to clarify that digital assets, including cryptocurrencies, can be considered a form of property. The aim of the bill is to provide legal certainty and protection for people and businesses who own and transact with digital assets and, it is said, will most likely reduce litigation costs by removing the need for owners of digital assets to seek to first establish that their asset is a type of property.

In theory, therefore, so long as the definition of a digital asset is wide enough to encompass a digital gilt, it might provide the necessary certainty to encourage the widespread adoption of digital gilts within the traditional financial system (TradFi). However, the current draft of the bill has deliberately not stated what type of digital assets fall within this category of property, or how the law will treat them. The government intends instead for these details to be developed by the courts, which are able to deal with matters on a case-by-case basis as has been happening in this area since 2019.

It is said that this approach is preferable to prescriptive legislation, which would be less able to respond to each new circumstance and technological development. Before the mass adoption of digital gilts, therefore, and unless the drafting of the bill is amended (which appears unlikely given its purposeful drafting), it is likely that the courts will need to consider whether a 'digital gilt' will fall within the definition of a digital asset in the intended legislation before real comfort is provided to those in the industry.

Regulatory hurdles

The regulatory status of digital assets in the UK has been evolving to keep pace with the growing importance of digital assets. While initially the FCA adopted a 'wait and see' approach, it has quickly had to work with other key stakeholders such as the BoE to implement regulation as the industry expands and as other jurisdictions have become attractive to this asset class and industry.

Although at first the FCA sought to impose only anti-money laundering and counter-terrorist financing regulations on cryptocurrency businesses operating within the UK, it soon expanded its reach to those who were advertising crypto assets and beyond. It has further developed its intended regulatory framework, having recently issued a discussion paper on stablecoins, and is currently consulting on its proposed rules for admissions and disclosures and market abuse in the cryptoasset sector. The FCA's roadmap also includes plans to consider regulation for trading platforms and staking, and so further regulation is very much expected in the UK in an attempt to promote transparency, consumer protection and seamless integration with TradFi. In so doing, it is hoped that the UK will build on its position as a global hub for innovation and responsible growth in this industry.

With the above in mind, it will come as no surprise that the FCA has for some time now provided various sandboxes to foster innovation, allowing tech companies and others to test their products, services or business models in a safe, controlled environment under the supervision of the regulator. A sandbox allows the regulator to observe the participants and to gather data on the

new technologies, which then helps it to develop more informed and effective regulations that should ideally balance innovation with consumer protection and market integrity.

The DSS therefore presents an excellent opportunity for both those operating in TradFi who want to move into decentralised finance (DeFi) and vice-versa to allow participants to test how to streamline their processes in issuing digital gilts on a blockchain. It is hoped that the DSS will be a success, which should help those using it come to market quicker once the sandbox has been completed.

Prospects and challenges

The future of blockchain in finance looks promising, but challenges remain.

The UK government's initiative to use blockchain for gilt issuance is a significant step forward, aiming to leverage blockchain's transparency, security, and efficiency to modernise the process. However, success depends on addressing implementation challenges and ensuring the technology delivers on its promises.

Significant obstacles hinder widespread adoption. Issuers may find it distracting from their primary task of issuing bonds. The DMO cannot yet claim blockchain enhances the gilt market or reduces costs. Investor benefits have not materialised, and incompatible platforms reduce liquidity and hinder secondary market growth.

Disrupting the status quo will be challenging. Start-ups may struggle in a heavily regulated market, while incumbents may be reluctant to invest in potentially disintermediating technology unless it is proprietary and permissioned, which defeats the purpose of blockchains.

Potential savings may be too small to incentivise large-scale issuance, and there is a risk of systems going over budget and being abandoned, as seen with the Australian stock exchange's blockchain integration that resulted in a write-off of AUD250 million (£125 million). Additionally, the unknown as to whether a digital gilt would constitute 'property' may cause further concern about the potential lack of recovery and enforcement action should the English courts determine that a digital gilt is not a digital asset, and to proceed to have this established will take both time and money to do so. There are also risks in sitting on the sidelines, as the City could lose out if institutions develop their technical solutions elsewhere.

The move to blockchain aims for transparency, security, and speed. While there is a speed advantage, whether this method delivers on transparency and security remains to be seen. Blockchain security can be theoretically and mathematically proven, but in practice, these systems are complex and prone to bugs and security flaws.

There is a valid concern that we may be losing control and understanding over the processes that govern our economic transactions. As technology and AI advance, maintaining control and understanding of these systems is crucial.

