



# **An introduction to Digital Capital Markets**

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NatWest

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# Welcome to Digital Capital Markets

Dear Reader,

Capital Markets are evolving, with an unprecedented level of recent attention given to digital assets and their potential to disrupt the existing state of play. Digital assets and their underpinning technologies have created an opportunity to re-evaluate our markets, understanding where they can be improved, and challenging participants to consider what the future could look like.

Digital asset adoption in financial markets is likely to be achieved in phases. We've already seen pioneers shifting the boundaries in this space and we expect further participants to experiment, collaborate and converge in order to refine applications and standards. It is encouraging to see the market and regulators actively challenging each other to establish initial guardrails around this ecosystem, hoping to avoid stifling innovation.

We believe an open, frank discussion on the status quo and a robust challenge of digital assets, is essential if we are to change our market for the better.

Here, we aim to introduce some of the basics of digital assets relevant to financial markets and we would like to encourage everybody to join us in this conversation.

Kind Regards,



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# What are digital assets?

At its most basic level, a digital asset is an asset that can be represented digitally.

The digital asset 'umbrella' encompasses several types of assets. Digital currencies are a significant component, whether they be cryptocurrencies or backed institutional currencies such as a Central Bank Digital Currency (CBDC). Additionally, digitised traditional assets such as bonds can be considered to be digital assets.

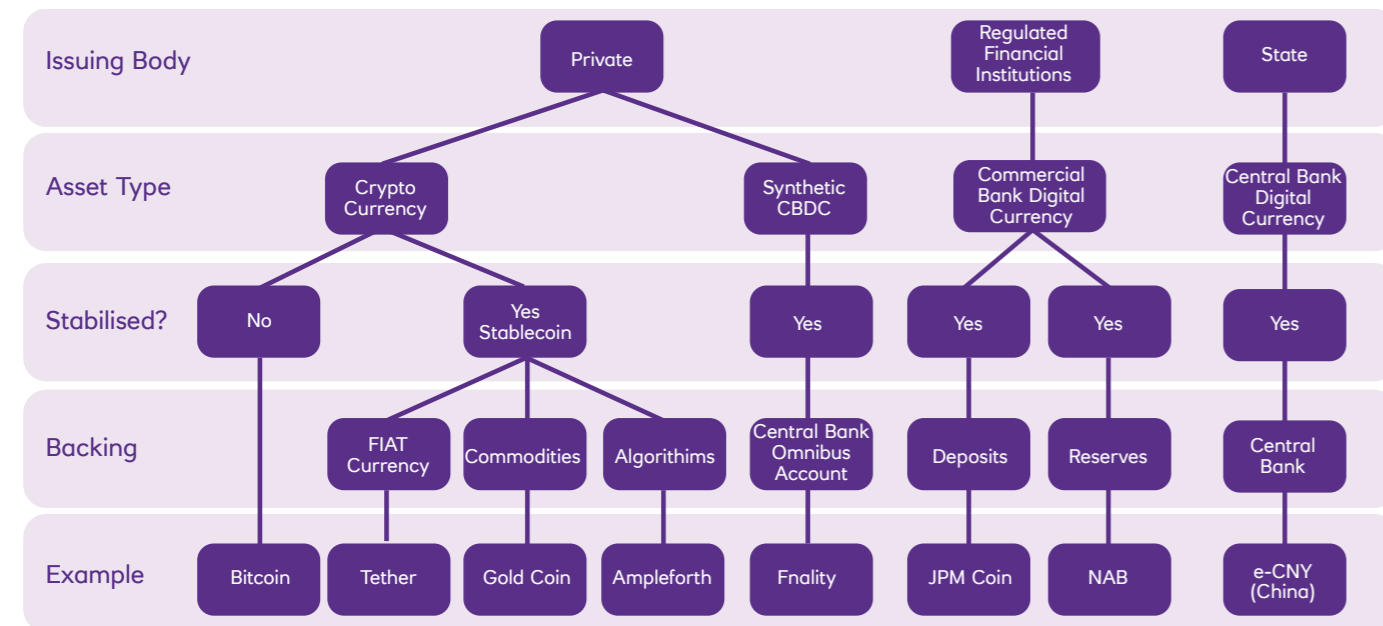
However, the line is often blurred when it comes to crypto assets, which are a type of digital asset. This is often lost in the complex patchwork of terminology used in the industry which only serves to muddy the waters further. The confusion can be attributed to the relative newness of the digital assets, meaning that clear categorisation is a challenging task.

There is no common consensus on a classification framework, as digital assets are not always mutually exclusive, and the creation of new assets makes it difficult to comprehensively cover all eventualities. It is not only the configuration and coding of an asset that categorises it, but also its intended use, functionality, and the legal implications of ownership behind the asset that contribute towards its identity.

Furthermore, the evolution of digital assets is ambiguous and fluid, meaning that any taxonomy needs to have built in flexibility to encompass new changes as time goes on and the use of digital assets is cemented in the financial ecosystem.

**“The creation of digital assets has opened up new opportunities and is steadily growing in popularity, with an expected user base of 412 million by 2027 according to Statista.”**

## Overview of digital currencies



# What are digital currencies?

Common public perception when hearing the term 'digital currency' is to jump to the conclusion that we are talking about cryptocurrencies like Bitcoin. This is however only a small piece of the puzzle. True, Bitcoin has highlighted the potential investment value and the capabilities of the underlying technology. However, its instability and unreliability as a store of value or investment has been clear for many to see.

Stablecoins were subsequently developed in a bid to harness the benefits of cryptocurrencies whilst also stabilising them by pegging the value back to an underlying asset. Another driver for stablecoins' creation was the need to be able to change between cryptocurrencies and traditional currencies by having a medium that would be readily accepted. However, stablecoins aren't always stable, as can be seen by the collapse of Terra Luna. Furthermore, stablecoins aren't currently regulated to the same extent as a traditional form of money, leaving questions over the asset backing ratio, and occasionally leaving consumers vulnerable if the chosen stablecoin is not adequately controlled.

The increasing popularity of stablecoins has the potential to affect central banks whether the banks issue their own digital currency or not, prompting them to prepare for the change. This includes seeking legal clarity on how digital currencies should be classified, since the underlying classification will determine how they will be regulated. There has been increasing focus on CBDCs, with over 90 central banks now exploring it as a possibility to support and develop their respective economies, whilst protecting the sovereignty of their own currency.

Depending on its design, a CBDC could become an accepted form of exchange, store of value and serve as a unit of account, which should make it fungible with its traditional equivalent. By getting involved, central banks can negate the fragmented and widespread adoption of different digital currencies which could otherwise undermine the payment system, hampering the ability of the central bank to implement policies for monetary and financial stability.

CBDCs are being explored both for retail and wholesale use, retail use would be for all customers and wholesale would be for financial institutions. The UK is currently in consultation regarding a retail CBDC. It is worth noting that even if one were to be implemented, the Bank of England have announced that the earliest would be 2027. The House of Lords outlined the limited added value of a retail CBDC, instead highlighting the potential of a wholesale alternative.

**“Central banks can negate the fragmented and widespread adoption of different digital currencies which could otherwise undermine the payments system.”**

There are several ways in which the Bank of England could choose to offer the capabilities of a wholesale CBDC. A possibility would be by delegating the digital currency infrastructure to a third party but allowing them to hold reserves to back the currency in an omnibus account at the central bank. This would effectively constitute a synthetic CBDC. An example of this is Finality, which has an omnibus account with the Bank of England and are due to go live with their digital sterling in H2 2023. Alternatively, commercial banks could also consider a digital currency given their current experience with handling and distributing traditional money, making them well positioned to handle the digital alternative. The UK Treasury have also highlighted the value of a privately issued commercial bank digital currency, stating these are further along than a CBDC and are well positioned to launch earlier.

Regardless of the exact programming and form a potential wholesale CBDC could take, it could help maintain financial stability all the while serving as a smooth transmission channel that will reduce opacity and complexity in the industry. The provision of a sound digital currency will also allow the private sector to continue to build innovative products and applications, further contributing to the advancement and resilience of the economy.

When it comes to Digital Capital Markets, digital currencies are primarily seen as a settlement token. Fundamentally, the tokenisation of assets is going to require a digital currency in order to exchange the money for asset, token for token, with the programmability for each being locked in a smart contract that would allow for instant settlement, thereby enhancing efficiencies and mitigating risk.

**“Stablecoins have proven to be extremely popular, with the market capitalization of the largest 10 stablecoins amounting to \$152 billion in 2022.”**

# Understanding distributed ledger technology

Distributed ledger technology (DLT) has the potential to transform workflows across many industries, with benefits such as increased transparency, faster and more efficient work processes, and cost savings. DLT is the infrastructure that allows for a decentralised digital database. The key feature of this ledger is that there doesn't have to be a central authority; instead, it is governed by various participants and the rules of the network which are established in the setup of each database.

DLT can be used in various architectures, blockchain being the most common variation, to ultimately serve as a way to store data. Ledgers can be both private and public, permissioned and permissionless. These configurations determine the different levels that participants in the network have when it comes to reading, writing and validating the information onto the ledger. This can be customised to be anywhere between as open and decentralised as possible, for example a public and permissionless network such as Bitcoin, to a private and permissioned ledger which essentially has minimal decentralisation and would be used mainly for internal purposes.

The benefits of one ledger over the other and the specific rules of the network are dependent on what you are using the ledger for. As a result, use cases and experiments in the industry explore the different variations, meaning that there is no 'standard' set up and institutions are working on different systems. This raises the issue of interoperability and standardisation, with the strength of an ecosystem depending on the consensus of key players and the scale of adoption.

## What is blockchain?

The term blockchain is often used interchangeably with DLT due to the fact that it is the technology behind the more commonly known Bitcoin. In a blockchain, the data is stored in blocks that link together through a unique cryptographic signature which is known as a 'hash'. As more transactions are recorded, additional blocks are added, eventually forming a chain of data. Hashes are the unique outcome of a specific input of information. Therefore, if you change the input, the hash would be altered, no matter how minor the amendment is. This is what gives the blockchain its immutability, as no tampering can be done without subsequently changing the hashes and therefore breaking the chain.

### NatWest and Santander pilot cross-ledger debt issuance

A tokenised bond was created on the public Ethereum test network and settled in a proof of concept delivery vs payment exchange against Fnlity tokenised cash. NatWest acted as issuer and dealer in the transaction, with Santander acting as investor.

Cross-ledger delivery vs payment exchange of tokens negates an assumption that both legs of a token for token exchange will occur on the same ledger, particularly important when we consider the disparate options available to a central bank when designing a digital currency.

# How digital assets could transform financial markets

Covid 19 paired with the continued cost pressures along the Capital Markets' value chain, have accelerated the development of digital adoption which can be seen across many industries. This has created increased competition from digital disrupters and has encouraged the industry to innovate and adapt. Whilst initial experimentation with DLT has proven difficult to coordinate and gain sufficient buy-in due to the associated regulatory risk and high investment costs, there is now momentum in the case for adoption and growth.

The use of digital assets could unlock a new era of innovation in Capital Markets, an industry notorious for its manual and labour-intensive processes. The potential of the innovation is significant enough that it could trigger a market reconstruction and redefine the roles of incumbent players. However, transformation on this scale is costly and risky, therefore focus has instead been placed on identifying individual use cases that best demonstrate the added value of the technology. The phased implementation of the different use cases could then pave the way towards a viable digital asset ecosystem.

## Digital bonds

We think that digital bonds are a suitable starting instrument, as traditional bonds are mature and well understood in addition to suffering from long processes throughout their lifecycle, which could be addressed through digitalisation.

Current pain points include the prolonged and manual bond issuance process, the fragmented liquidity due to the over-the-counter nature of the market, the difficulty in accurately pricing the bond, high barriers to entry which reduces demand and increases cost, and risk due to extended settlement times. Digitalisation with the use of blockchain and digital currencies is one way that could tackle these pain points as outlined below.

1. Automation through smart contracts can reduce the manual processes which are often prone to inefficiencies
  - Automation can reduce duplication of effort, particularly in pre-issuance activities
  - Faster execution reduces associated risks and improves market liquidity
  - Programmability of tokens or digital currencies reduces settlement risk
  - Long term cost reduction stemming from disintermediated workflow
  - Potential for disintermediation as processes are automated and redefined
2. The accessibility of data could provide unprecedented levels of transparency and accountability
  - Enhanced information leads to more accurate pricing, improving market efficiencies
  - Near instant settlement eliminates data silos and the processing gap between back and front offices
  - Open information negates the need for bilateral reconciliation
  - Increased security as all market players have access to the information
3. Digital assets may help to lower barriers to entry to a wider customer base, who will be able to access fractions of assets they couldn't previously invest in, thereby promoting higher financial inclusion
  - Deeper, more liquid debt markets from reduced barriers to entry provides for a more diversified funding base

### EIB issue first digital bond on a public blockchain

EIB leads innovation in the digitalisation of capital markets in its issuance of a EUR 100m 2-year bond in the form of digitally native tokens. Issuance performed in collaboration with Goldman Sachs, Santander and Société Générale.

These digital bonds will play a role in developing more streamlined access to alternative sources of finance to boost funding for project worldwide.

## Foreign exchange

In addition to bonds, DLT could also transform cross-border payments. The near instant settlement capability is particularly relevant given there is still an estimated \$8.9 trillion at risk on any given day (BIS, 2019). Utilising digital solutions could materially reduce this settlement risk. Additionally, the associated cash buffers that companies need to hold, would be reduced and held for shorter periods of time, thereby contributing to improved liquidity in the market.

These benefits are however not straight forward to implement due to operations spreading across different jurisdictions. The importance of market cooperation is even more pronounced in Foreign Exchange (FX) and will necessitate coordination across multiple global entities. Therefore digitalising this area of the industry is more feasible once the digital ecosystem matures and the technology has already been tried and tested in practical situations. The geographical and political obstacles put additional pressure on the need for regulatory guardrails which will help promote standardisation across countries in order to maximise the potential of the technology.

Although there is a wide range of platforms that offer potential solutions to DLT integration in the FX space, there is no mass adoption of any one provider as market participants are still trying to understand the level of integration required to balance legacy systems with technology platforms. For this reason, partnerships are still open conversations whilst further use cases are trialled, and the technology proves its value.

## Environmental, social, and governance (ESG) risk management

With global temperatures soaring, climate concerns are at the forefront of people's minds. There is a strong call for companies to do more to fight climate change and contribute towards climate initiatives such as the Paris Agreement's target of limiting the increase in global warming to 1.5°C. The importance of green initiatives is visible in Capital Markets, as demonstrated by the fact that green bond issuance has grown by 75% in 2021 (BIS, 2022).

There are rules that green bonds must abide by, particularly surrounding their use of proceeds towards solely green initiatives. However, the communication of bonds' sustainability objectives and the reporting of their progress has proven to be a challenge. There is little infrastructure to track this information, and the subsequent inaccessibility of data creates opacity as to whether the bonds are truly contributing to their intended goals and therefore having a positive impact on the environment. Poor reporting on the bonds' output and performance can also mask the true impact of the investment and whether the funds are genuinely being used to achieve their advertised goals or whether there is risk of greenwashing. These scenarios create reputational risk for investors which threatens the credibility of the asset and could ultimately reduce demand and undermine the otherwise 'honest' green bonds.

Digitalising the bonds could address these challenges, as the blockchain allows for a ledger with all required information to be available to investors in real time, providing transparency on exactly what the funds are contributing towards and how the funded projects are meeting their green goals. Further actions or data tracking can be programmed into the bond, providing features such as automatic calculation of the reduction in carbon that the funded project has created. We believe that the high demand for the bonds, paired with the increased functionality that the blockchain could provide in their issuance and management, may make these assets a driving force behind wider digital asset adoption.

### HSBC and Wells Fargo use blockchain to settle forex trades

The banks are using the Baton Systems platform to settle FX trades using real currencies and accounts in near instant settlement - approximately 3 min. This cuts exposure and settlement risks in addition to increasing liquidity.

Utilising this platform also bypasses the need for traditional third-party CLS which is used by banks globally to settle FX. This is an example of the technology causing market disruption and disintermediation.

### BIS and HKMA launch project Genesis 2.0 for green bonds

Following the successful tokenisation of green bonds in Genesis, BIS and HKMA have created a second prototype using carbon credits based on smart contracts, attached to green bonds in order to contribute towards the 1.5C climate goal.

The technology facilitates the creation of a new structure for green bonds where the bond's future repayments are made using carbon credits that are largely generated by the activities that the original green bond financed itself.

# The role of regulation in fostering a digital assets ecosystem

Digital assets have generated both excitement and concern amongst regulating bodies. The novelty of digital assets has been a hot topic, which has led to a need for specific legal constructs to be identified. A lot of work has already been undertaken in order to clarify the legal standing of digital assets. The emerging opinion is that assets with the same risk as traditional assets should be similarly regulated. The introduction of new technology has the potential to create systemic risk for the economy if not carefully controlled. However, innovation is also a key driver of economic growth and needs to be facilitated by the state. Therefore, regulatory guardrails are important to balance both the growth and financial stability of the economy.

The need for legal and regulatory clarity is particularly prevalent in such a highly regulated environment such as the financial industry, but the perception of ambiguity is impacting the speed of innovation. In a bid to address this, global standard setters are putting together recommendations or launching consultations. Bank for International Settlements (BIS) have published guidelines for the treatment of cryptocurrencies in an attempt to align the regulations and facilitate standardisation, and the Financial Stability Board (FSB) are currently undertaking a consultation on the regulation of global stablecoins, due to be released in 2023.

The risks and benefits of digital assets form an ongoing discussion, as the full impact of the technology can't be comprehensively assessed until further use cases are implemented. A way of resolving this impasse has been created in the form of regulatory sandboxes. This allows the private sector to trial new products in a pre-determined and well-controlled environment. The sandboxes also encourage further collaboration across the market, as institutions will have the ability to discuss partnerships on a trial basis. This collaboration can also be seen between banks and Fintechs, who are trialling new solutions in a combined effort to guide the market in the right direction.

Much progress has already been made in terms of establishing a legal framework, and the continued collaboration between government and market players should herald the beginning of broader market adoption in the next few years as the value of the technology is proven further. This will be aided by the creation of clearer regulatory and legal guidelines which are currently being considered. We believe it is still important to keep a certain degree of flexibility when considering regulatory guardrails, in order to capture the fluidity of the technology and use cases that are still likely to evolve further.

# Summary and outlook for Digital Capital Markets

Digital assets and digital currencies are still in their infancy and are therefore dealing with the associated growing pains when it comes to comprehensibility, scalability, interoperability and reliability. In order to help advance their use and acceptance in Capital Markets, work needs to be done by both participants and regulatory bodies to better define and oversee them.

The benefits of digitalisation and DLT could improve the entire value chain, however implementing such a disruptive change is not feasible as a singular process overhaul. Instead it should be tackled in phases. Prioritising specific efficiencies and processes is preferable over market reinvention, even though it means slower progress towards an end-to-end solution. Although there is no current 'dominant design' in how the efficiencies can best be achieved, recent successful use cases are pushing the development onwards. We believe that digital bonds are a good place to start in order to drive further innovation and grow the scope of digital assets.

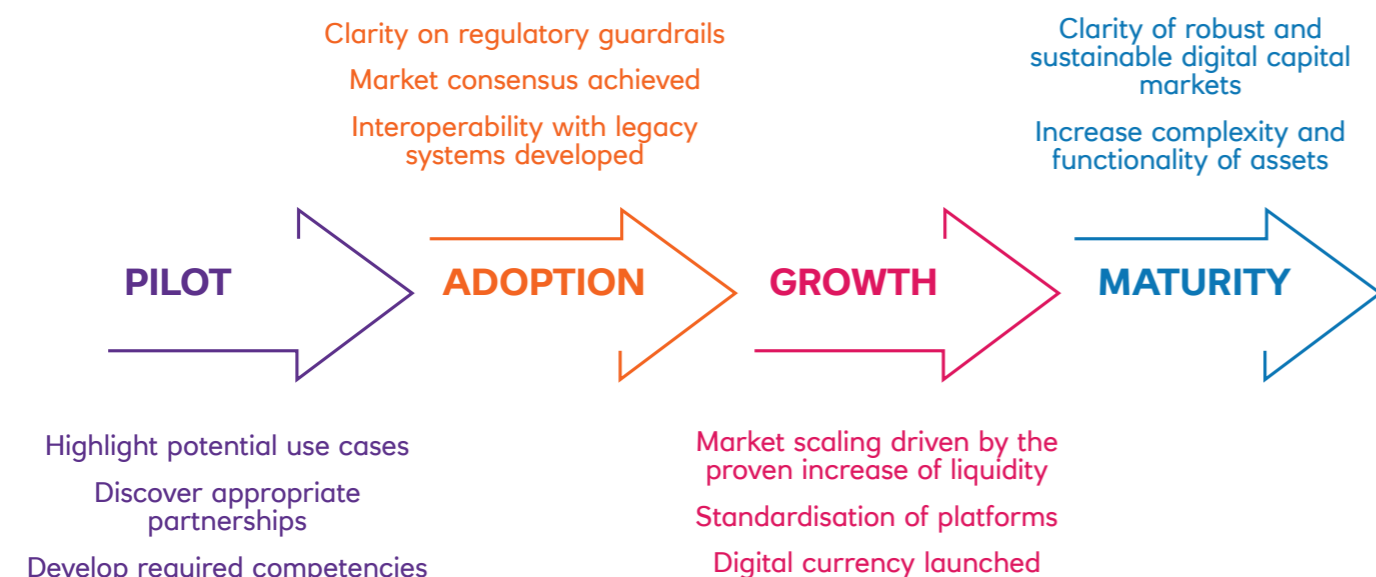
# What's expected ahead?

Digital Capital Markets are still in the pilot phase of technological innovation. In order to create a viable and robust ecosystem, with business led products and value-added services, the next few years should see a shift from piloting use cases to adopting the relevant solutions.

As live transactions drive increased adoption, interoperability and standardisation should start to become apparent, further guiding the market to adopt proven processes and grow the supply and demand for digital assets. It is likely that early issuances of digital bonds will be aligned with investor focus areas such as ESG bonds. The functionality and programmability of digital assets will increase as the market adopts and uses them, therefore unlocking their full potential through participation.

Long term, as more participants are encouraged to engage, we should see the establishment of a strong network effect that further cements the value of the innovation, thereby scaling up the market and driving improved liquidity.

The move to a mature market will be a joint effort from all market participants, with collaboration being key to a successful outcome. Here at NatWest, we have been taking part in piloting the applicability of digital assets, led by the specific value we can bring to the market and our customers. We plan to continue to do so, facilitated by regulatory sandboxes and strategic partnerships in order to find the most suitable path ahead and contribute to the shaping of the digital asset ecosystem.



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Glossary of definitions

Historic Trade ideas log

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