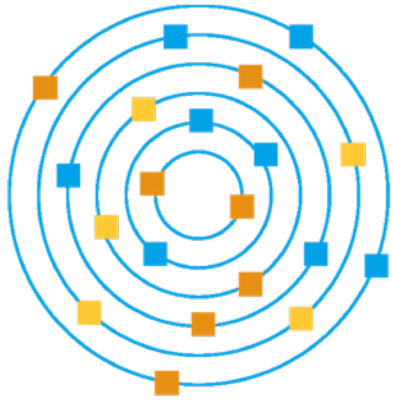
FX tokenization:

Need a token? Is something broken?

Tokenization is not exclusive to the world of payments, nor the wider financial industry. But in the foreign exchange (FX) space, interest is increasing, research is ramping up, and numerous initiatives are exploring the potential benefits of tokenization. Though tokenization is more established in the securities sphere, the payments space has not yet reached a consensus on what should be tokenized or how. In the wholesale FX market, it is not clear which problem a token would solve.

Tokenization, then and now



The concept of a 'token' is not new, and in fact dates back to 9000 BC. Far removed from today's digital era, small stones or discs were used as instruments representing promises to trade certain commodities, such as measures of cereals, oil and small cattle.[1] The essence of tokenization remains today: using a representation of a real thing to facilitate trading or a change of ownership.[2]

Today that representation has become digitized.[3] Digital tokens can represent a range of tangible assets including real estate, commodities and artworks, as well as intangible assets such as securities and central bank digital currencies (CBDCs). The intangible categories are the focus of this paper.

Tokenization firmly found its financial feet in the wake of the crypto boom, post financial crisis.[4] Though the hype around crypto currencies may operate in cycles of volatility corresponding to their value, the beginning of this trend toward tokenization and the use of distributed ledger technologies (DLT) as a new form of payment rail have prompted both traditional banks and new players to explore tokenization to facilitate financial transactions.

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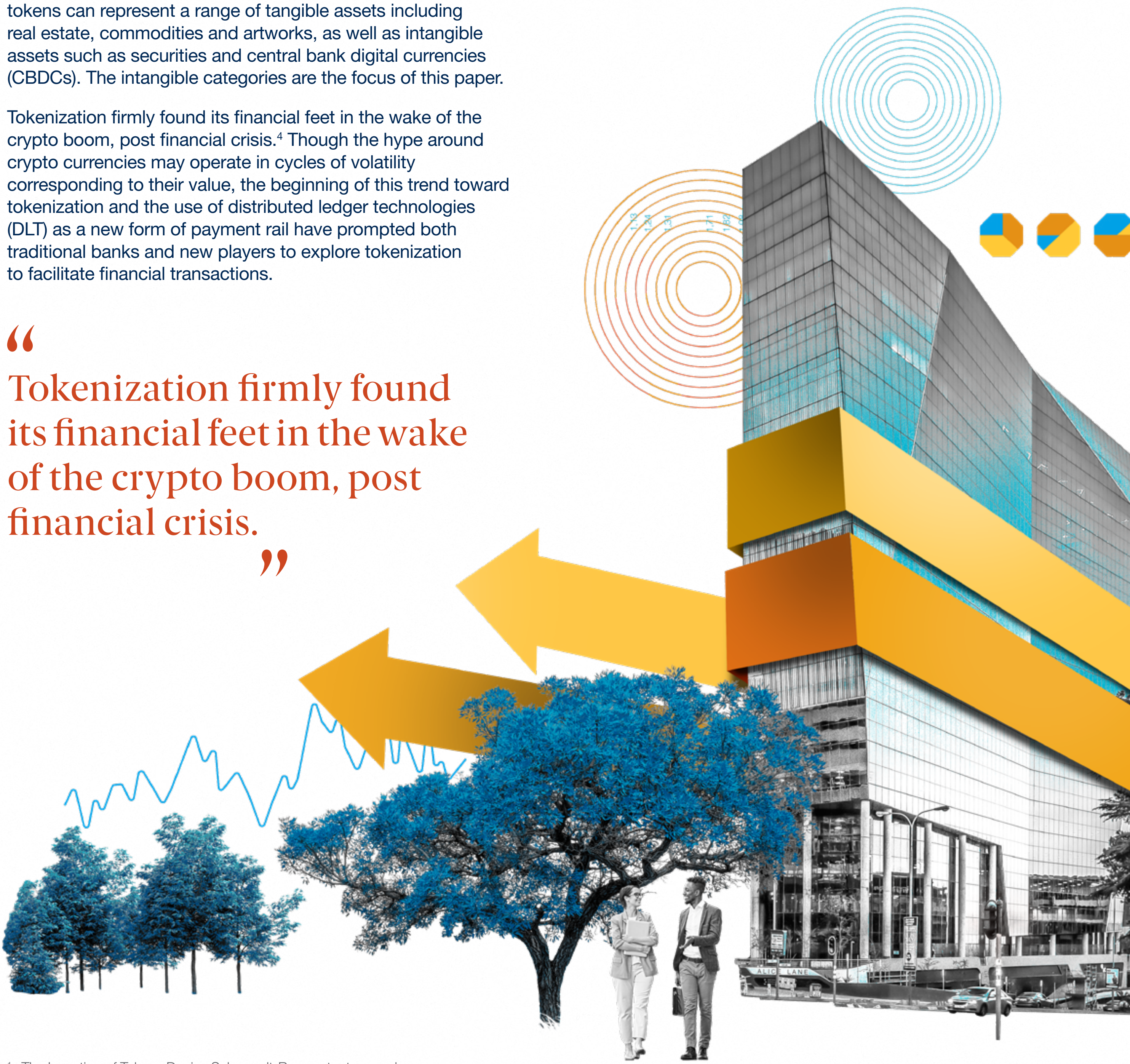

[1] The Invention of Tokens Denise Schmandt-Besserat: utexas.edu
[2] WEF_Modernizing_Financial_Markets_with_Wholesale_Central_Bank_Digital_Currency_2024.pdf: weforum.org
[3] What is tokenization? McKinsey.
[4] What's 'Tokenization'? Why Are Banks Rushing to Do It? Bloomberg.

The token taxonomy and CBDCs

There is no common agreement on what a token is. When the discussion around CBDCs intensified in the second half of the last decade, distinctions were made between token-based and account-based CBDCs. In token-based CBDCs, the validity of the object is verified (e.g., similar to verifying banknotes), while in account-based CBDCs, the traditional concept of book money applies and the account holder (i.e., the payer) is verified.[5]

This classification of account- and token-based CBDCs has been largely abandoned. While it may help in determining design and use cases, the underlying technology blurs the boundaries between them. Sending and receiving money requires an openly distributed public key (which may resemble an address or account), as well as a secret private key to identify the object. Public/private-key encryption combines both categories.[6]

At a high-level, putting an intangible asset on a DLT environment would automatically turn it into a token.[7] Under this logic, a wholesale CBDC (wCBDC), which is central bank money on DLT, would effectively be a token without naming it as such. This would render the term ‘wCBDC token’ somewhat of a tautology. A narrower view is that an asset must be put on a DLT environment that is not governed by the asset issuer in order to be a token. Under the narrower view, CBDCs would only qualify as tokens if the DLT platform is not solely governed by the issuing central bank.

Definitional disparities are perhaps not surprising given the different requirements of jurisdictions experimenting with tokenization. There are also a number of legal, regulatory, governance, economic, as well as technical challenges that come with designing and implementing tokenization models. These challenges are reflected in the Bank for International Settlements’ (BIS) ‘Tokenization Continuum’ (figure 1),[8] which “highlights a trade-off: where tokenization is easiest, per-unit gains are likely to be modest; but where tokenization is difficult, the potential benefits are the largest.”[9]

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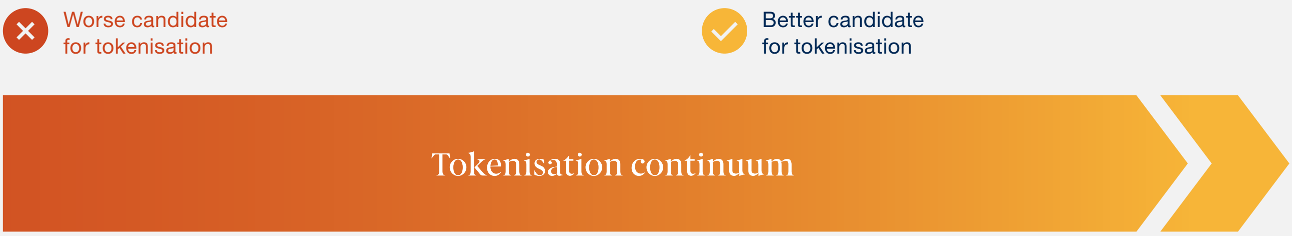
Figure 1: **Tokenisation Continuum**



- Fragmented processes with manual interventions
- Complex legal framework
- Complex regulation

- Streamlined processes with little manual intervention
- Clear legal framework
- Clear regulation

Source: Bank for International Settlements

[5] Central bank digital currencies: bis.org
[6] Garrat, R et al (2020) Token- or Account-Based? A Digital Currency Can Be Both.
[7] CPMI (2019) Wholesale digital tokens; “New technologies, such as DLT, make it possible to represent and transfer assets in new ways. Digital tokens are a key example.”
[8] Though we used the American spelling of ‘tokenization’ in this publication, the BIS uses the British spelling ‘tokenisation’.
[9] The tokenisation continuum: bis.org

The token use cases:

The lack of consensus about what is and what should be tokenized has not prevented its exploration in a new ecosystem of innovations across the payments sphere.[10] Numerous jurisdictions are examining this trend of tokenization with hopes of increased efficiency, transparency and lower transaction costs.[11] Various initiatives are analyzing a range of use cases to determine which problems tokenization can address, the majority focusing on delivery-versus-payment (DvP) and payment-versus-payment (PvP) models.

DvP use case:

Tokenization is gaining momentum in the assets and securities space. In the US alone, the market for tokenized US Treasury bonds grew from USD114 million to USD845 million over the last year.[12] Looking ahead, it is predicted that 5 to 10% of all global assets will be tokenized by 2030.[13]

The benefits of tokenizing assets include a more standardized asset life cycle, operational efficiencies, democratization of access and fractionalization of value. There remains a disagreement on whether to tokenize the payment ('P') leg of DvP transactions: if the securities leg is DLT-based, how should the cash leg be designed?

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There are three main solutions, each presenting a unique set of trade-offs:[14]

Figure 2: The creation of a technical bridge to connect traditional RTGS systems (central bank money leg) and DLT (securities token leg). This bridge caters to technical interoperability without the need for CBDC tokens, though it may present challenges in connecting to legacy architectures.[15]

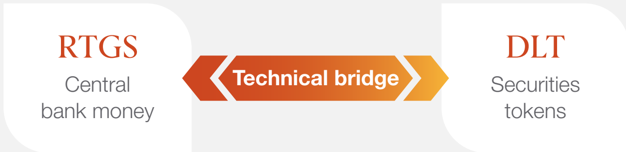

Figure 3: The creation of a DLT platform for central bank money settlement (CBDC leg) that interacts with a market DLT platform for securities settlement (securities token leg). Co-existence with traditional RTGS systems may require an additional layer of inter operability and may create separate liquidity pots.[16]

Figure 4: The creation of a single DLT platform on which both the CBDC leg and the securities token leg settle. This single platform approach may bring multi-jurisdictional and governance challenges.[17]

Source: CLS

[10] Denis Beau: The future of money – regulatory and policy issues related to the introduction of CBDCs: bis.org
[11] Ibid.
[12] Clearstream joins ECB wholesale CBDC trials with tokenized securities: cointelegraph.com
[13] HSBC, Northern Trust estimate 5-10% of assets will be tokenized by 2030 – Ledger Insights – blockchain for enterprise.
[14] The Eurosystem set up a dedicated market contact group in 2023, the New Technologies for Wholesale settlement Contact Group (NTW-CG), to support its exploratory work in using new technologies for the settlement of wholesale transactions in central bank money. The group has considered these three models. CLS is a member of this group.
[15] Trigger Solution Deutsche Bundesbank
[16] N.26–MISP.pdf: bancaditalia.it
[17] Project Helvetia – Settling tokenised assets in central bank money: bis.org

Views are split across the industry on the preferred 'P' or payment method for settling tokenized transactions. Some believe the cash leg also needs to be 'on-chain' to realize the full benefits of tokenized assets,[18] such as reducing operational costs as well as simplifying back-office reconciliation processes. Others see existing payment systems as fit for purpose (or able to be upgraded) for integration with token networks to settle the payment leg.[19] Consensus is likely years away, and several experimental projects are now exploring more than one solution.[20]

A recent BIS survey demonstrated a preference for central bank money as the basis for financial market transactions settling tokenized assets, which would maintain the 'singleness of money', ensuring that the value used in monetary exchange does not fluctuate between different forms such as privately- or publicly-issued money.[21] If the tokenization of assets became mainstream, the central bank community believes settlement in central bank money would be 'crucial'.[22]

The survey also found that 94% of central banks are now exploring CBDCs and that there has been a sharp uptake in experimentation in wCBDC. This increase in activity is partly due to central banks' drive to provide a safe settlement asset in a tokenized ecosystem.[23]

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[18] The Hong Kong Monetary Authority stated in February 2023 that in order for the benefits of efficiency and automation to be realized through tokenizing bonds, the payment leg must also be tokenized. See Hong Kong Monetary Authority – Eddie Yue on Tokenised Bond: Huge Potential to be Unlocked: hkma.gov.hk
[19] Various central banks are modernizing their payments infrastructures. See, e.g., the RTGS Renewal Programme Bank of England (RTGS Renewal Programme – Bank of England).
[20] For example, Project Helvetia Phase III (the SNB announced in March 2023 that it would be examining three models for settling the cash leg of tokenized asset transactions).
[21] Embracing diversity, advancing together – results of the 2023 BIS survey on central bank digital currencies and crypto.
[22] Speech by Thomas Jordan, Chairman of Governing board of SNB, BIS Innovation Summit 2024.
[23] Recent BIS survey on CBDC references central bank concerns that singleness of money may be threatened by the emergence of new forms of privately issued money. A wholesale CBDC could provide a safe settlement asset for tokenized transactions and help ensure the singleness of money.

PvP use case:

Debates around the suitable cash leg for tokenized transactions are even more pertinent when considering the payment legs in a PvP use case. Though the DvP business case for tokenizing assets has been well defined, it is not yet clear what problem tokenization is trying to solve in the wholesale payment space, particularly in the FX market. Besides providing the cash leg for settlement of tokenized assets, the question is whether and how tokenization can make the FX market more efficient.

Some argue the key benefit of tokenizing FX transactions using DLT is instant settlement on a 24/7 basis.[24] However, it has yet to be determined whether this is even desirable on a large scale in the FX market. As discussed in a previous white paper,[25] same-day and instant settlement remain a niche market in FX, mainly because of the large amounts being transferred and the resulting need for liquidity optimization. For example, CLS, the wholesale settlement backbone for the global FX market, settles USD6.6 trillion daily, though through liquidity optimization processes, CLS provides savings of up to 99%.[26]

Another potential benefit is that tokenization in FX transactions could provide PvP solutions for emerging market currencies. These currencies are gaining ground in the FX market and are often unable to use existing PvP solutions. However, the key challenges in expanding PvP adoption to these currencies are not technological but rather legal, political and regulatory in nature. Answers to these challenges have not yet been solved using 'tokens', and this has led to a subset of other novel challenges.[27]

Despite the difficulties of large-scale tokenization in the wholesale FX market, the momentum in the securities space may continue to encourage further tokenized PvP exploration, as well as drive forward the business case for wCBDC.

Three main approaches could be taken:

Figure 5: Create bilateral links between CBDC / DLT networks for cross-border wholesale payments; the focus on immediate bilateral settlement would preclude any liquidity benefits from multilateral netting.[28]

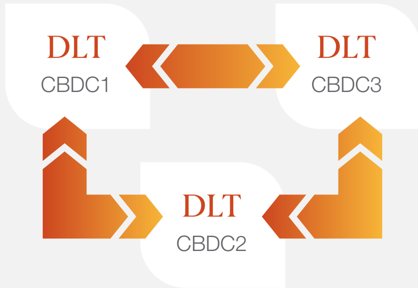


Figure 6: Create a central hub (e.g., in the form of a separate entity) for connecting DLTs. This approach would allow for multilateral interactions and netting.[29] While industry experiments may prove this is technically viable, further legal, regulatory and operational considerations must still be evaluated.

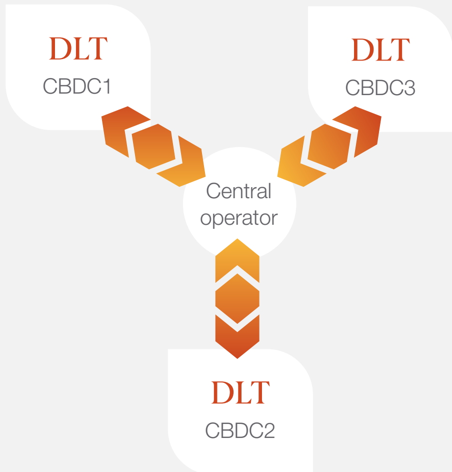


Figure 7: Create a single common programmable DLT platform that hosts multiple CBDCs and ensures interoperability between them. This approach may come with multi-jurisdictional and governance challenges, similar to the considerations for the single DLT platform DvP use case.[30]

Source: CLS

[24] Digital Finance CRC Tokenised FX Settlement: dfcrc.com.au
[25] fx_ecosystem_05_fx_settlement_instant_still_distant_apr2024pdf.pdf: cls-group.com
[26] Whereas settlement in CLSSettlement occurs on a gross basis, the corresponding funding process takes place on a net basis, delivering huge liquidity efficiencies. Funding requirements for each CLSSettlement member are based on a multilateral net calculation of the expected positions in each CLS-eligible currency. This multilateral netting results in liquidity savings of approximately 96%. Pay-in obligations can be further reduced using an optional in/out swap tool. As a result, CLS settlement members fund only around 1%.
[27] cls_opinion_piece_cbdc_the_fx_game_changer_19mar2024.pdf: cls-group.com
[28] Project Cedar Phase Report: newyorkfed.org
[29] swift_cbdc_sandbox_project_results_report_phase2_final_220324.pdf and Project Meridian FX: joint project by the Eurosystem and London Centres, and the Bank of England, to test synchronised settlement in FX: bis.org
[30] Press release: Project Agorá: central banks and banking sector embark on major project to explore tokenisation of cross-border payments: bis.org

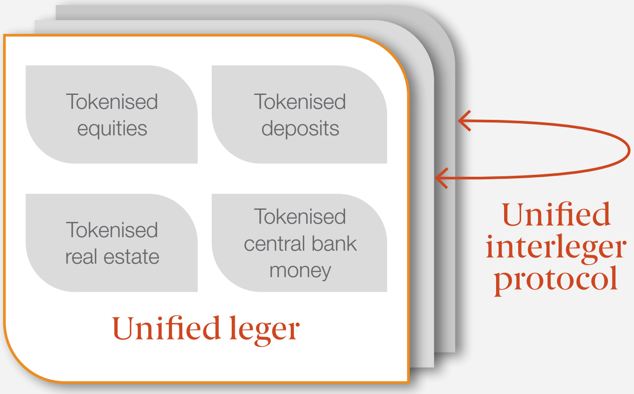
Unified, not universal

Innovation to date has been siloed. Some innovators and policy makers now believe that to improve monetary systems, the various elements of tokenization should be combined in a new type of financial market infrastructure (FMI) – a 'unified ledger'. This concept was first introduced by the BIS in 2023,[31] and now underpins the design in the upcoming Project Agora launched by the BIS.

In essence, a unified ledger is a digital platform that brings together multiple financial asset markets – such as wholesale tokenized central bank money, tokenized commercial bank deposits and other tokenized assets like company shares, corporate or government bonds and real estate – as executable objects on a common programmable platform.[32]

However, unified does not mean universal. It is expected that multiple unified ledgers could coexist, and technical interoperability between them will be an important design consideration. In addition to technical challenges, important governance, legal and regulatory questions need to be answered in any unified ledger design. A recent Official Monetary and Financial Institutions Forum poll found that respondents considered governance to be the greatest challenge in building a unified ledger system.[33]

Figure 8: **Unified ledger**



Source: BIS paper 2024, 'Finternet: the financial system for the future'

How will token be spoken in the future?

Interest in tokenization is increasing rapidly across the payments space. The benefits of tokenizing assets are clear, but consensus is lacking around the benefits of tokenizing cash and PvP settlement. Deciding whether to tokenize requires careful consideration of not just technical issues but also legal, regulatory, operational and economic challenges. For now, the jury is still out on how this will unfold in the FX market.

[31] Innovation and the future of the monetary system: bis.org
[32] Finternet: the financial system for the future: bis.org
[33] Digital money summit 2024: new engines and new rules – OMFIF.

For more information please email info@cls-group.com

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