

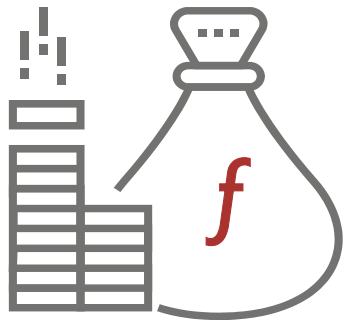
Tokenisation for the real world

OCC Symposium on the "Tokenization of Real-World Assets and Liabilities"
Washington DC, 8 February 2024

Hyun Song Shin*
Economic Adviser and Head of Research

*The views expressed here are mine and not necessarily those of the Bank for International Settlements

Throughout history, innovations in the monetary system have coincided with major leaps in economic activity



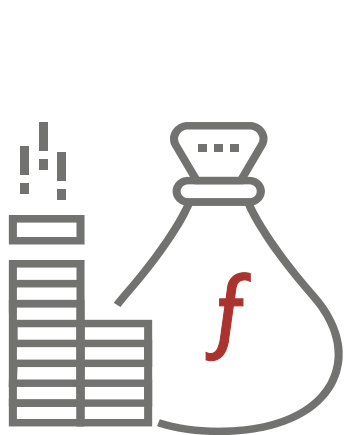
Money in the form of book entries overseen by trusted intermediaries opened the door to new financial instruments that spurred trade and commerce



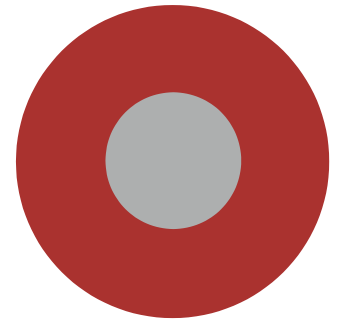
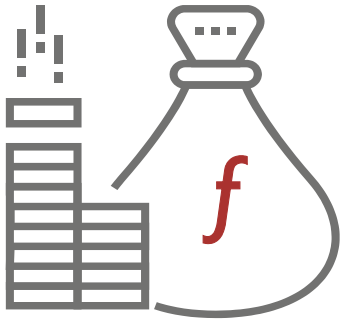
Paper ledgers gave way to their digital counterparts; digitalisation and the dematerialisation of money have wrought profound changes on society at large



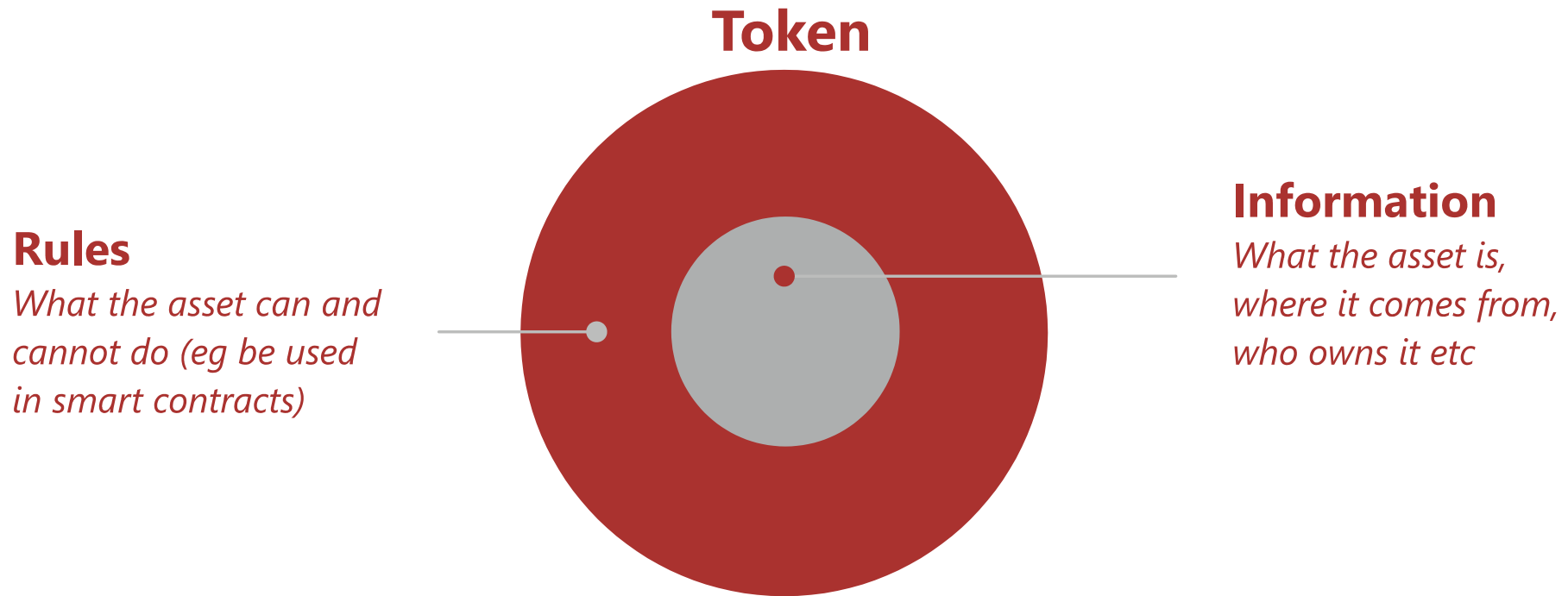
Following dematerialisation and digitalisation, what could be the next step in the evolution of the monetary and financial system?



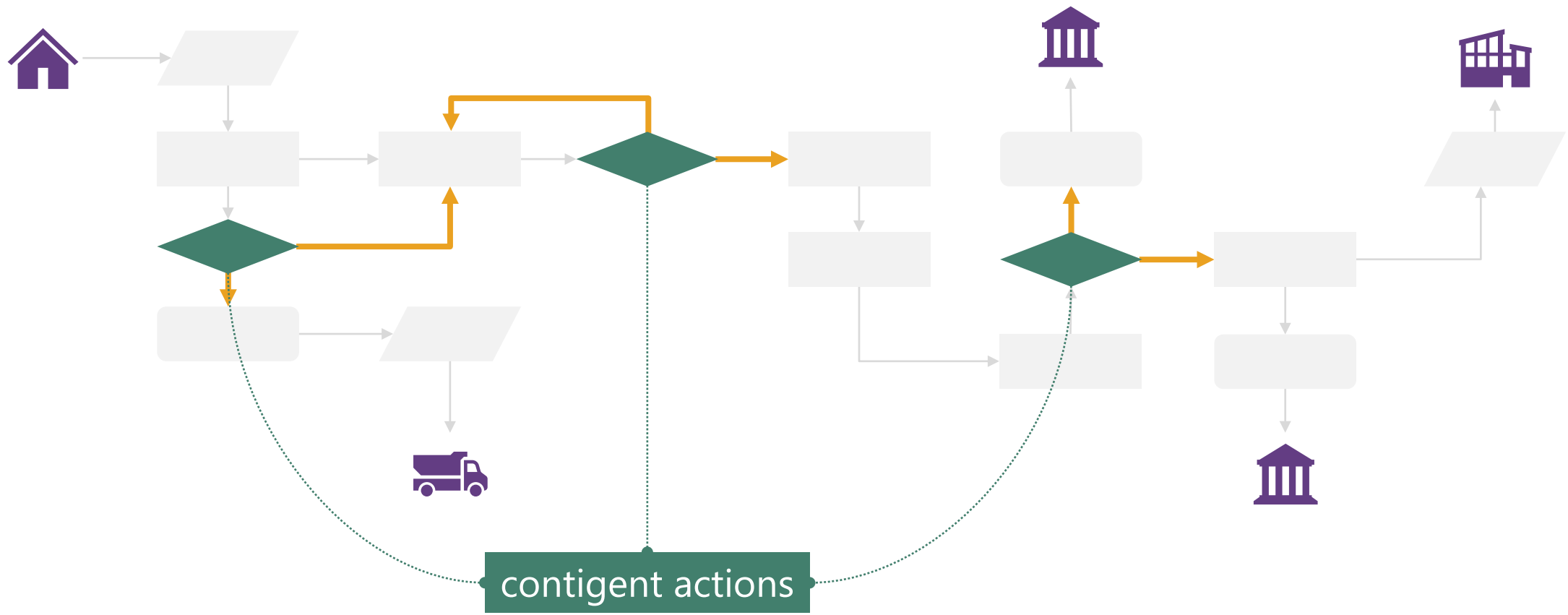
Tokenisation could be the next big development, unlocking new types of economic arrangement



Tokens integrate records in a traditional database with the rules and logic governing the transfer of that asset



Tokenisation enables the contingent performance of actions



Consider how the system works today



Amalia

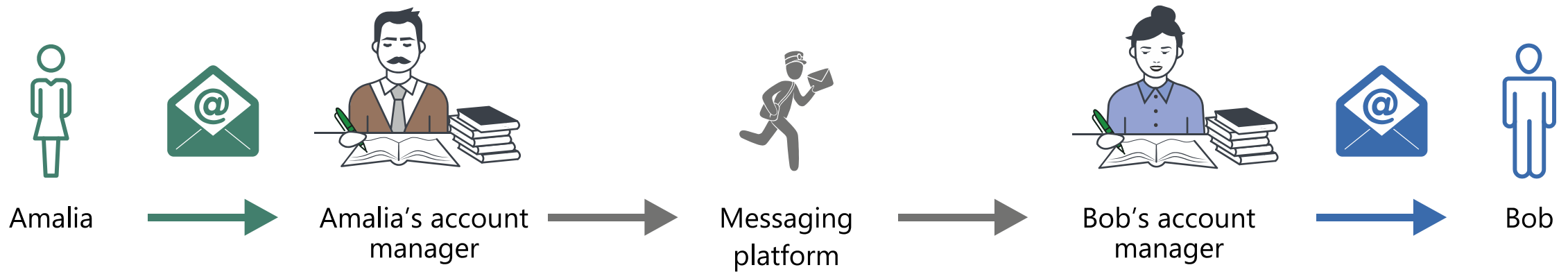


Bob

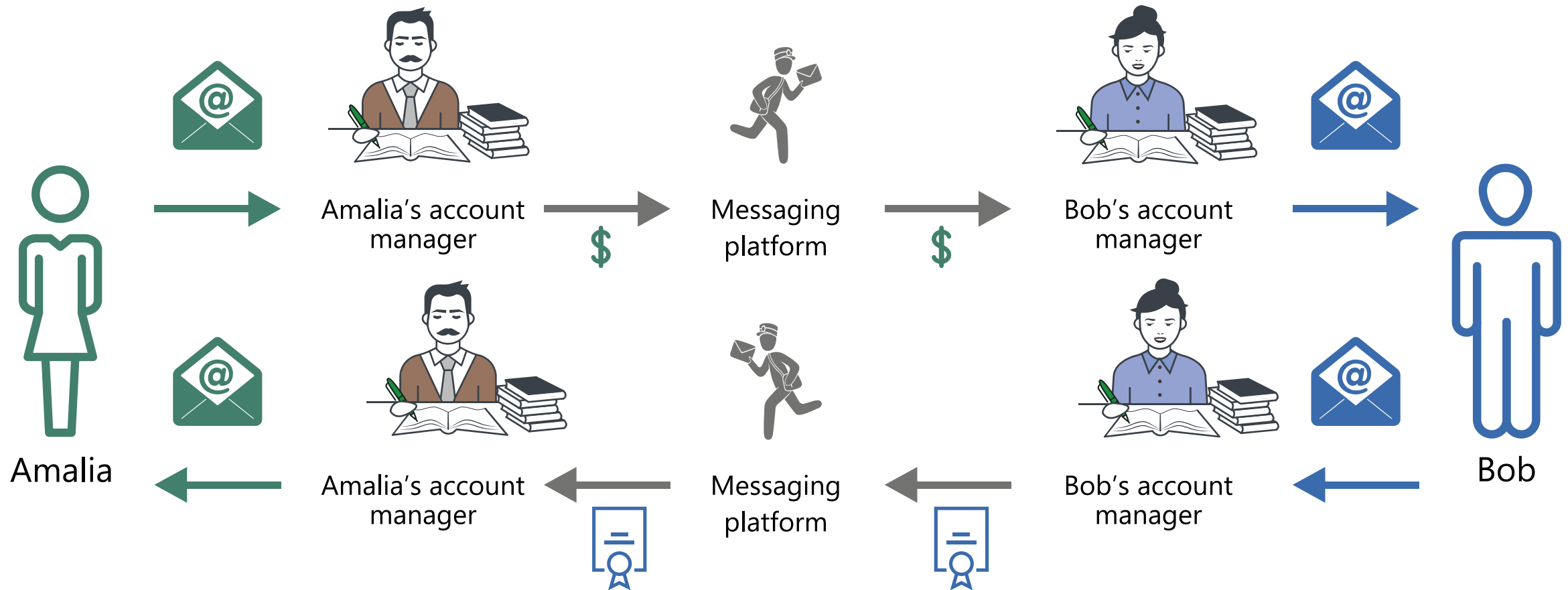
Account managers are entrusted with maintaining and updating an accurate record of ownership and transfers



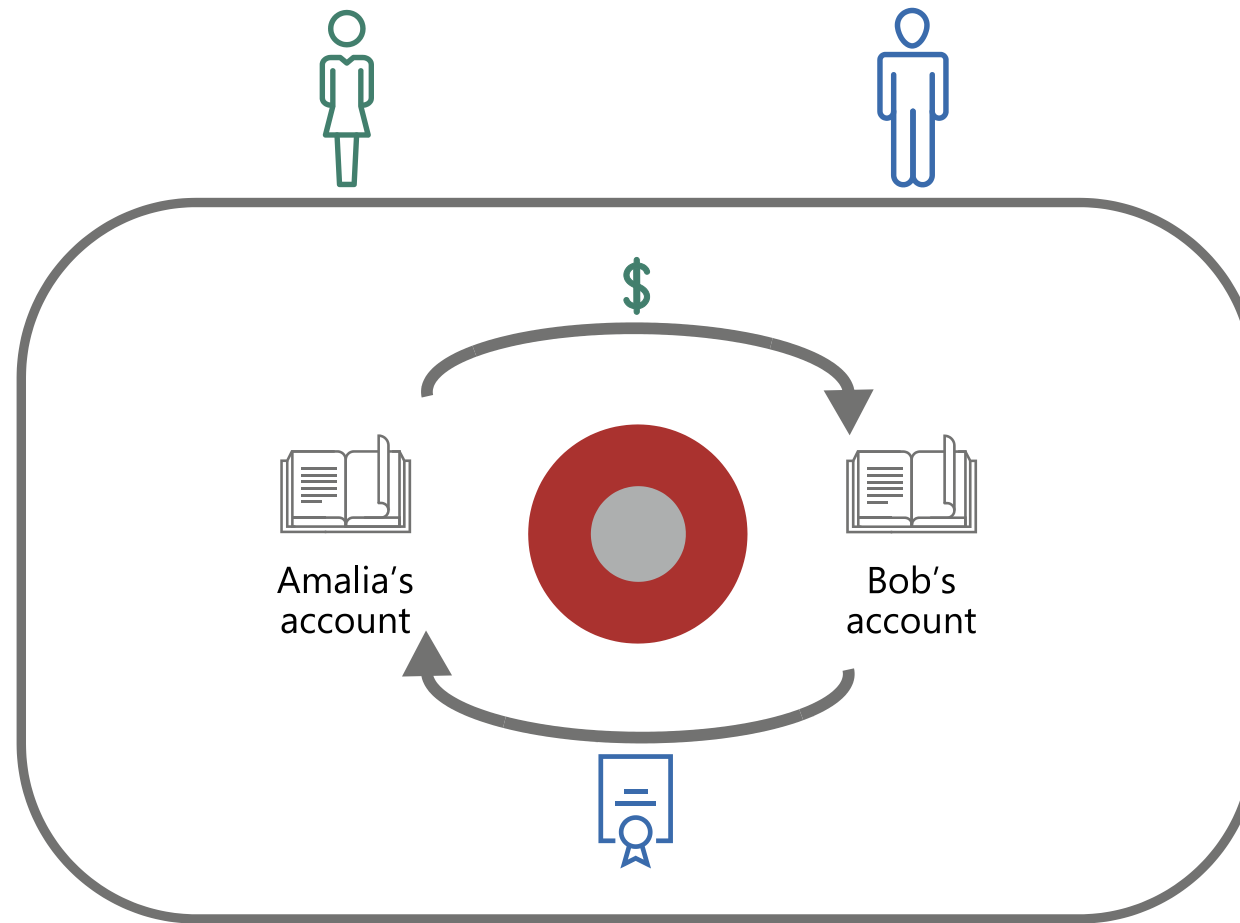
External messaging systems link these databases, and the separation between messaging, reconciliation and settlement limits the capabilities of the system



Canonical use case is in joint execution of sale and payment: address principal risk through “delivery versus payment” (DvP) and “payment versus payment” (PvP)



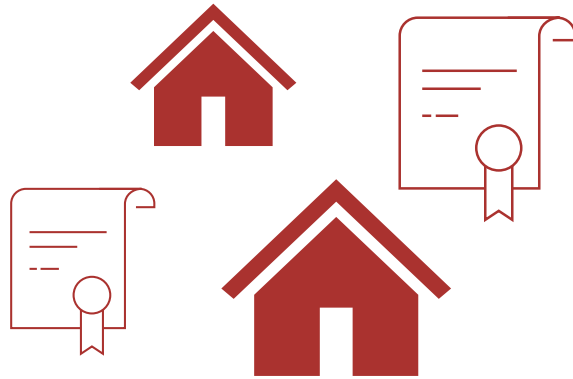
Tokens enable *atomic settlement*, where reciprocal transfers between Amalia and Bob occur simultaneously, with one transfer being a precondition for the other



Two points of emphasis on the scope of my remarks today

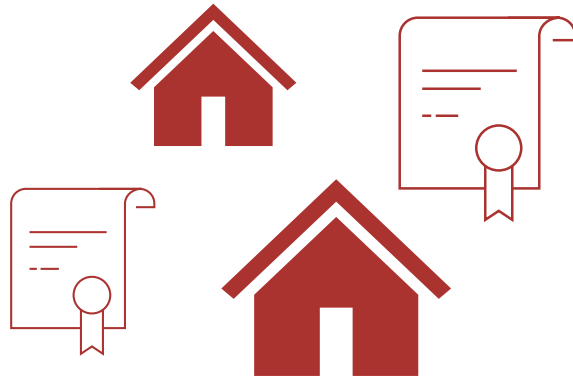
Two points of emphasis on the scope of my remarks today

- My remarks are about the tokenisation of **real-world** assets, not crypto DeFi

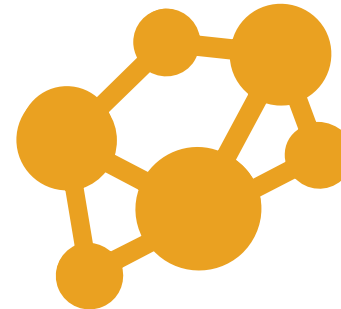
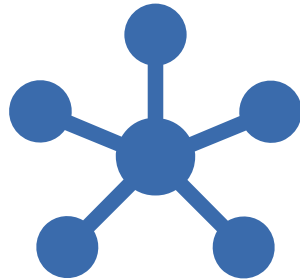


Two points of emphasis on the scope of my remarks today

- My remarks are about the tokenisation of **real-world** assets, not crypto DeFi



- “Tokenisation” is not synonymous with “decentralisation”



Delivery-versus-payment is not a new idea; mitigating principal risk has long been discussed at the BIS



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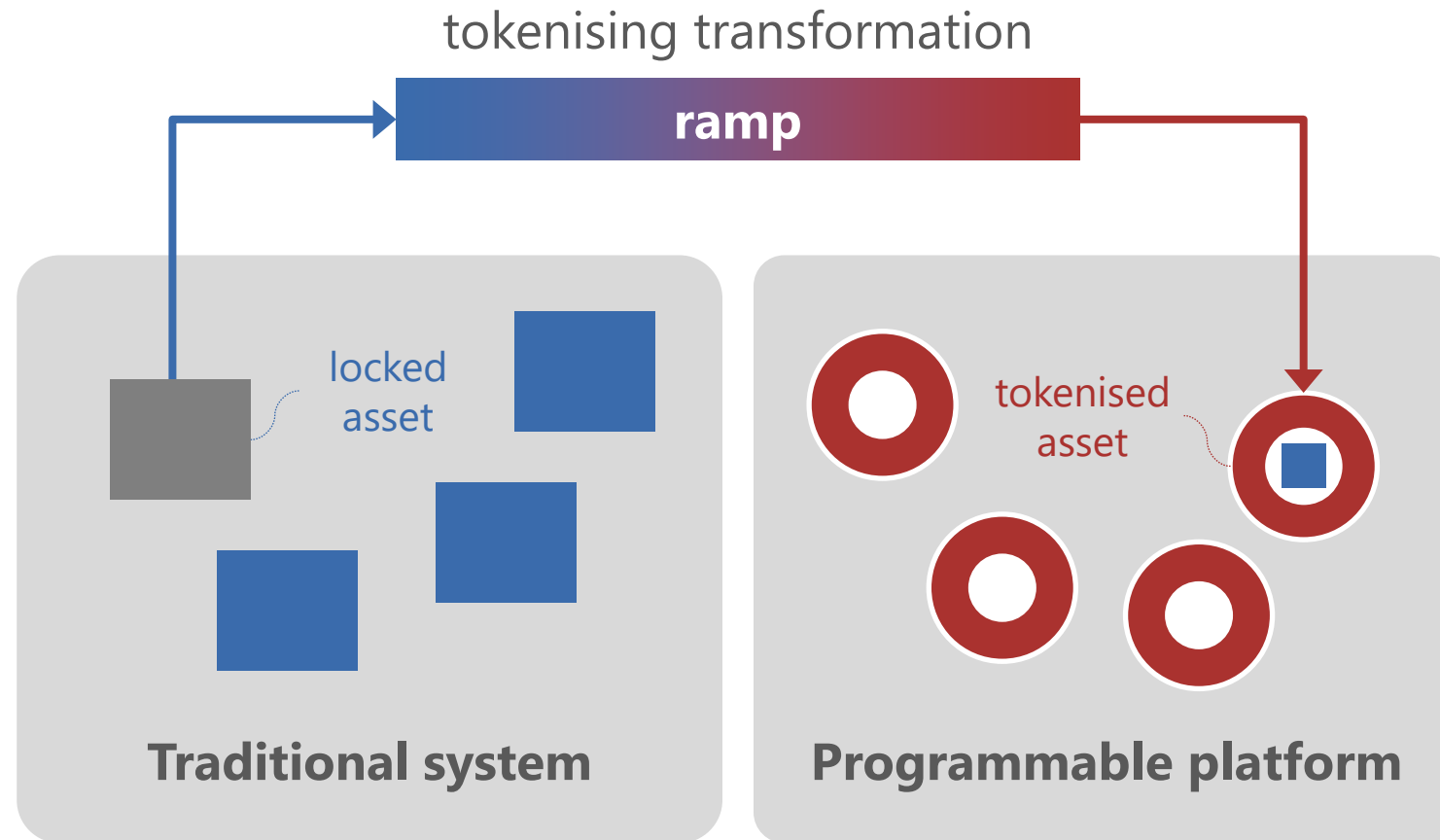
Delivery versus payment in securities settlement systems



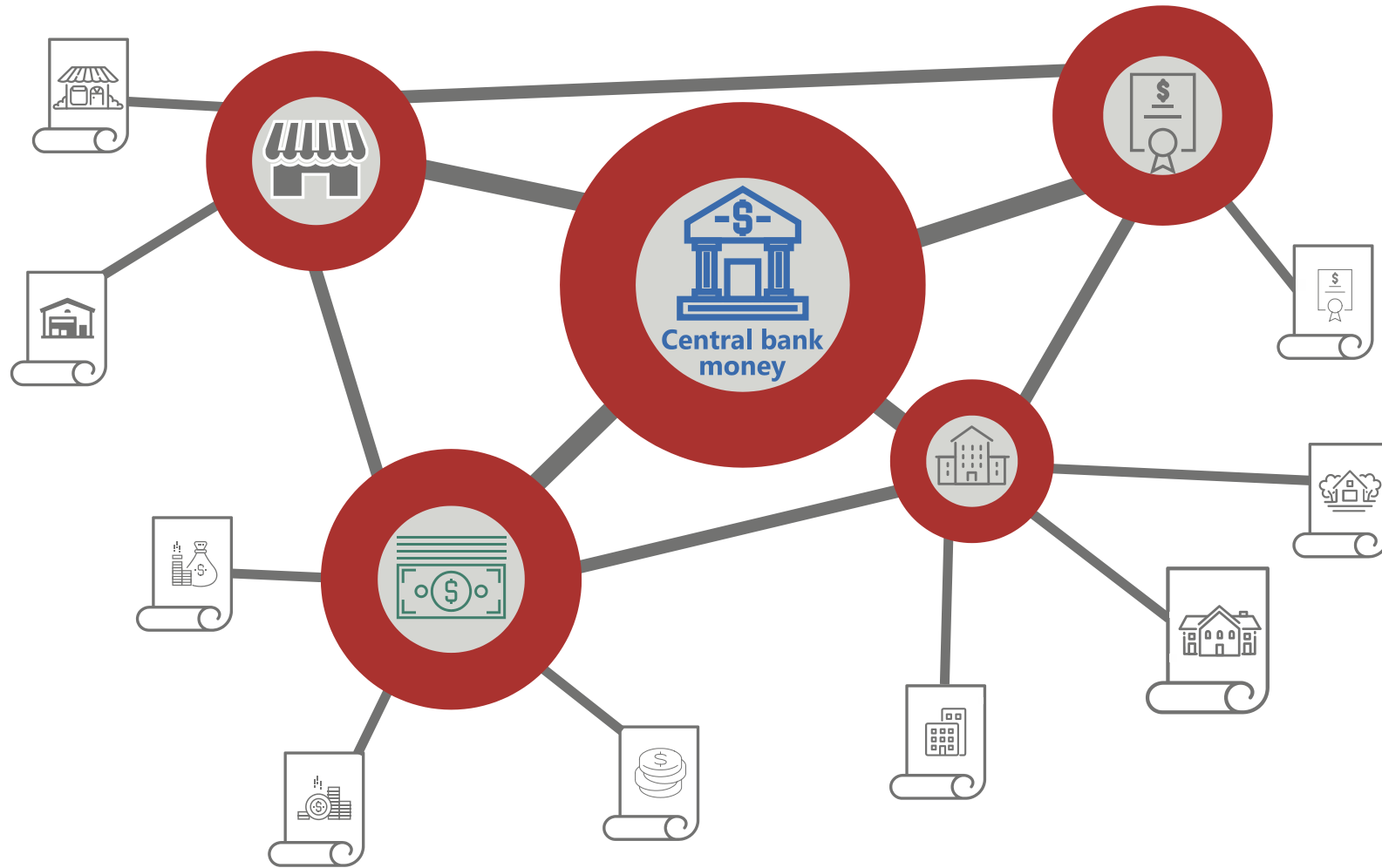
CPMI Papers | 09 September 1992
[PDF full text \(408kb\)](#) | 86 pages

The worldwide collapse of equity prices in October 1987 heightened the awareness of central banks of the potential for disturbances in settlements of securities transactions to spread to payment systems and to financial markets generally. Since then, central banks in the Group of Ten countries have been working with market participants and securities industry supervisors to strengthen settlement arrangements. In particular, most of the G-10 central banks have been actively involved in efforts to implement the Group of Thirty's recommendations for strengthening and harmonising settlement arrangements for corporate securities as well as in efforts to strengthen settlement arrangements for government securities.

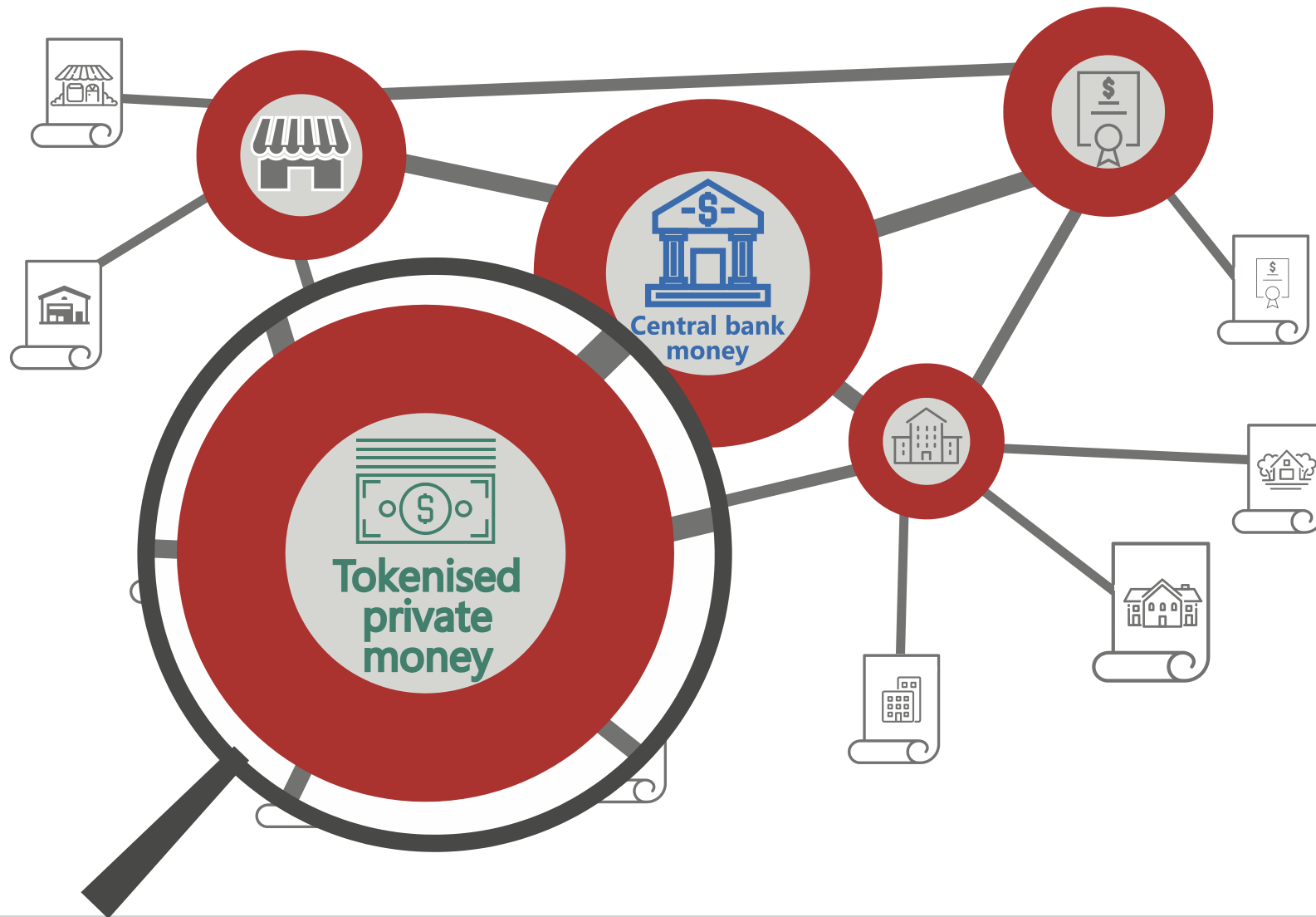
Legal framework is always in the background



Providing central bank money in *the same venue* as other claims is necessary for settlement

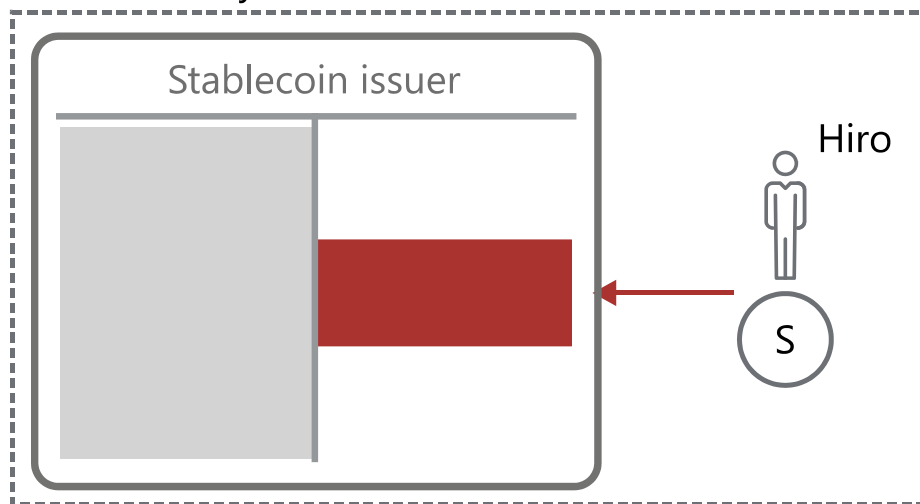


Tokenised private money serves as the primary means of payment; two candidates are asset-backed stablecoins and tokenised deposits

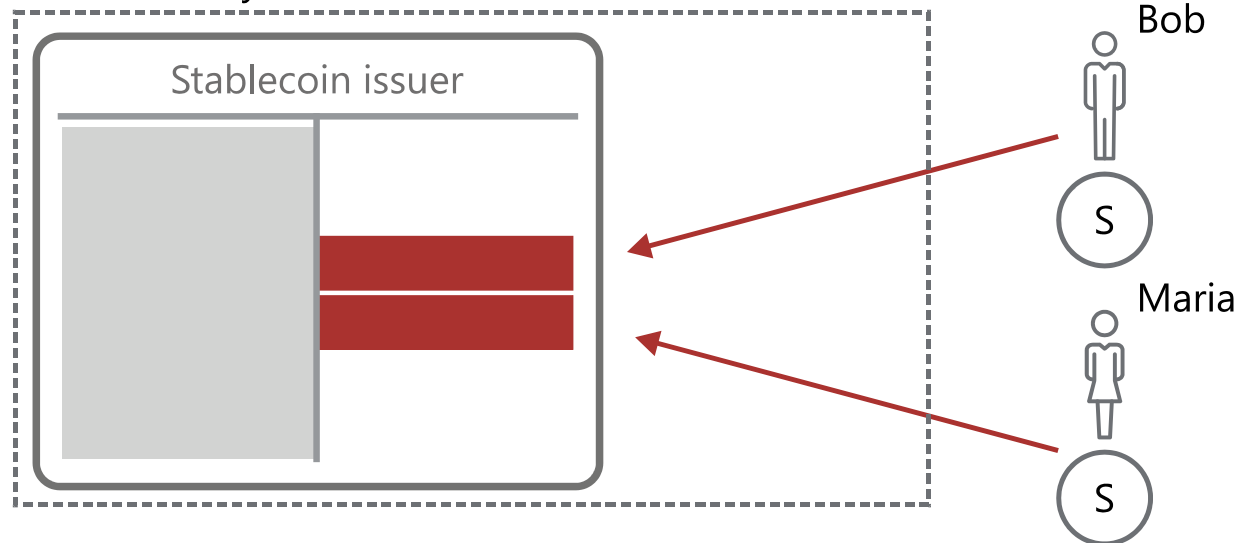


Stablecoins represent a transferable claim on the issuer, akin to a digital bearer instrument

KYC boundary

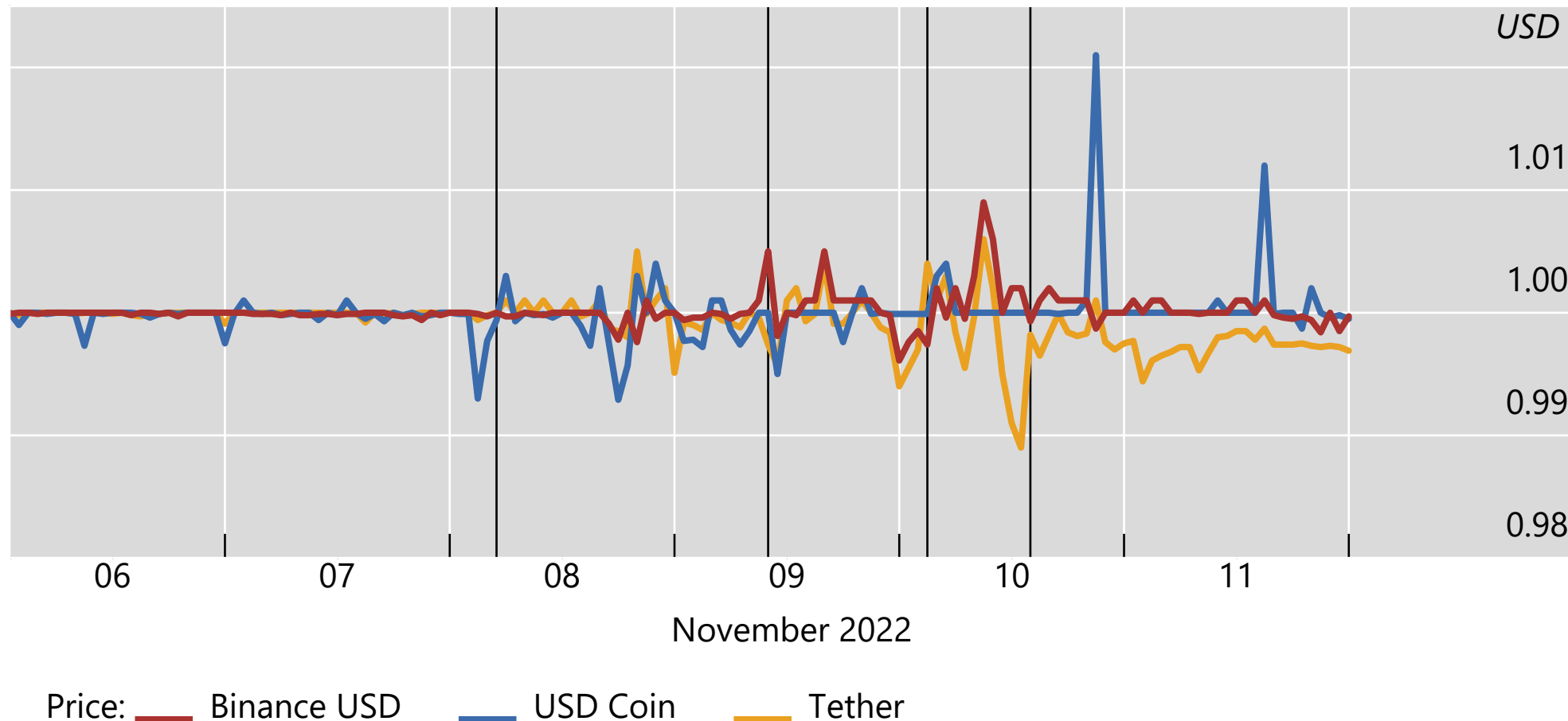


KYC boundary

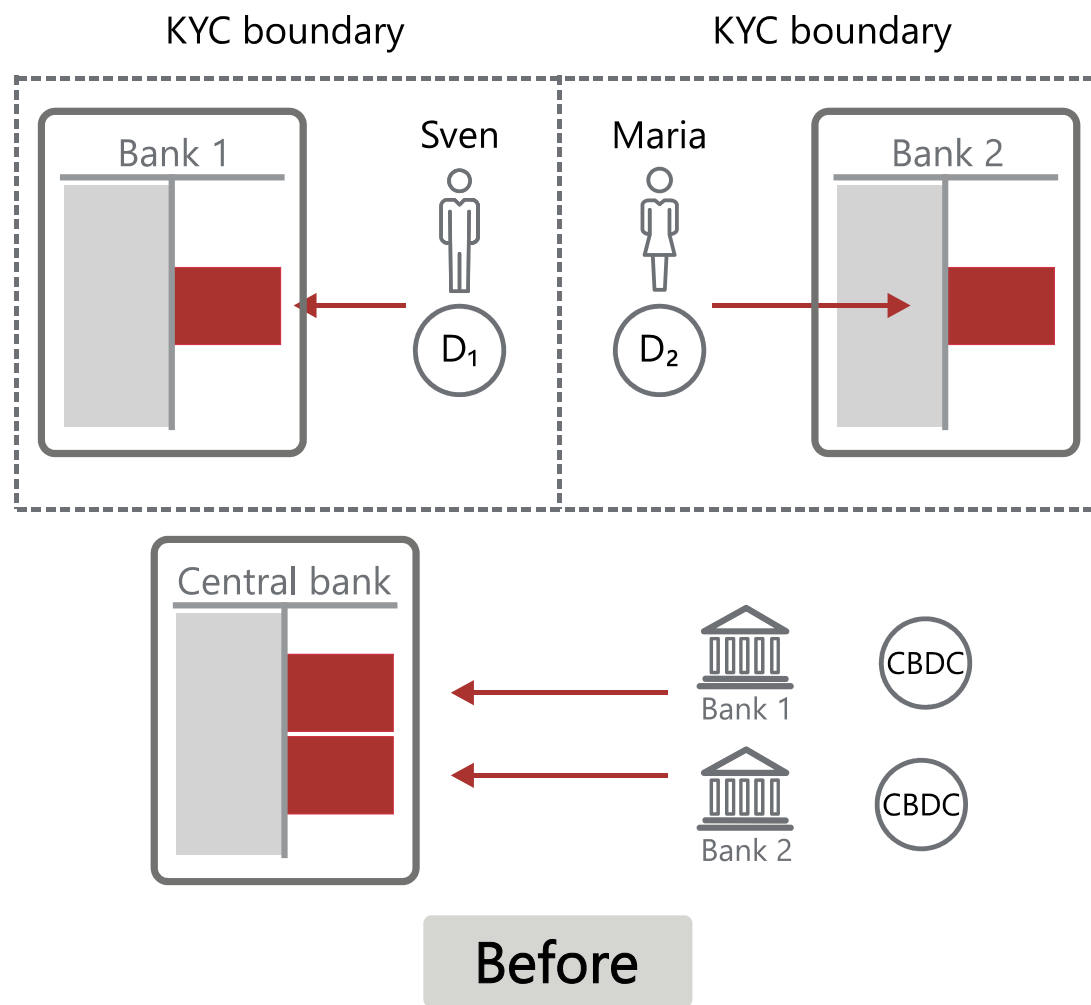


Stablecoins' relative exchange values may depart from par, violating the principle of the "singleness of money"

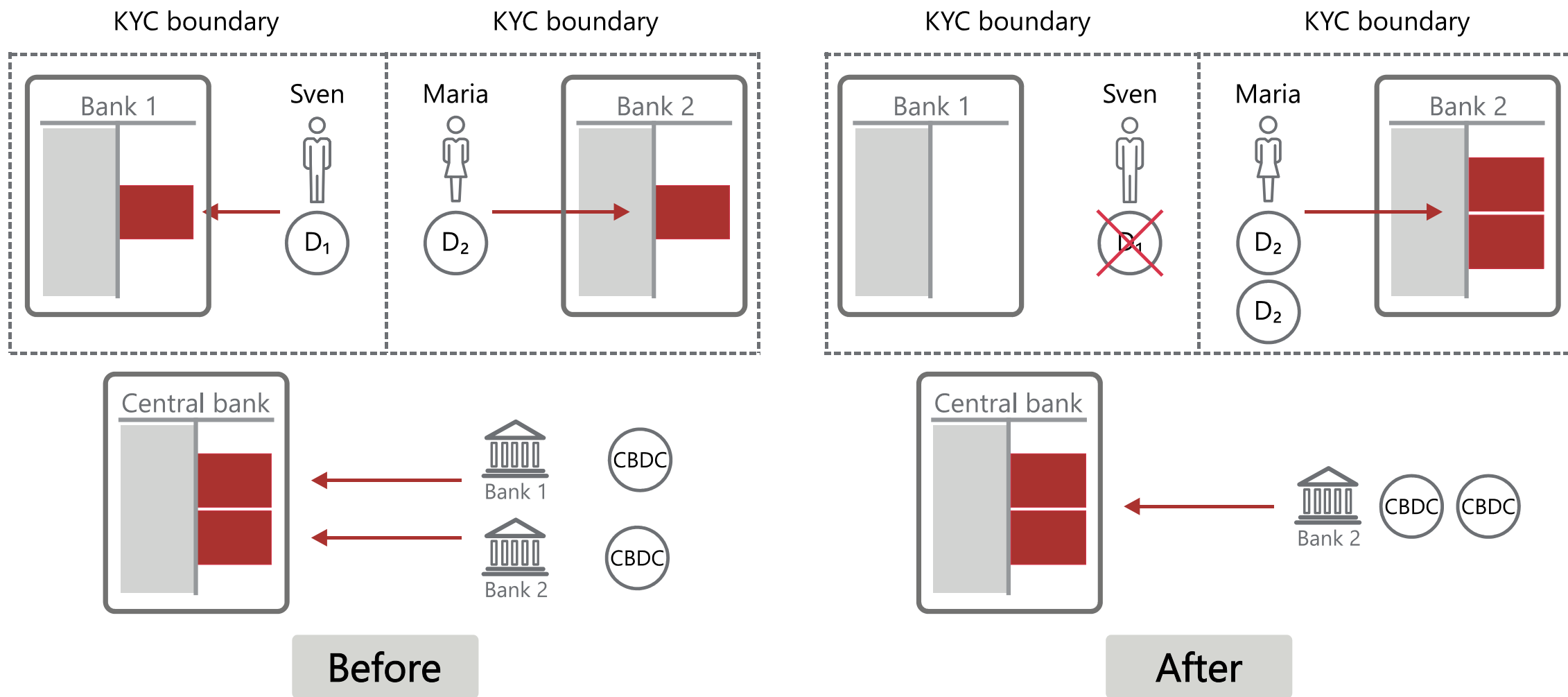
Prices of stablecoins around the FTX collapse



Tokenised deposits are conducive to singleness, enhancing the key advantages of the two-tier monetary system



Payments are settled using central bank money, ensuring they all go through at par and preserving the singleness of money



Promising route is to bring together CBDCs, tokenised deposits and other tokenised assets on a shared programmable platform – a unified ledger



Central bank money resides in the same venue as other tokenised claims, giving firm foundation to the functionalities flowing from tokenisation



BIS Annual Economic Report
2023, Chapter III

“Closure property” is test for feasibility of tokenisation application

- **Are all actors necessary for the application present and available to be tied into the tokenisation?**
- “Closure property” holds when the answer to the above question is “yes”
 - Terminology comes from the mathematics of closure operations
 - Closure operator $C(.)$ maps collection of nodes to enlarged collection taking dependencies into account
 - “Closure property” holds for application involving set A when

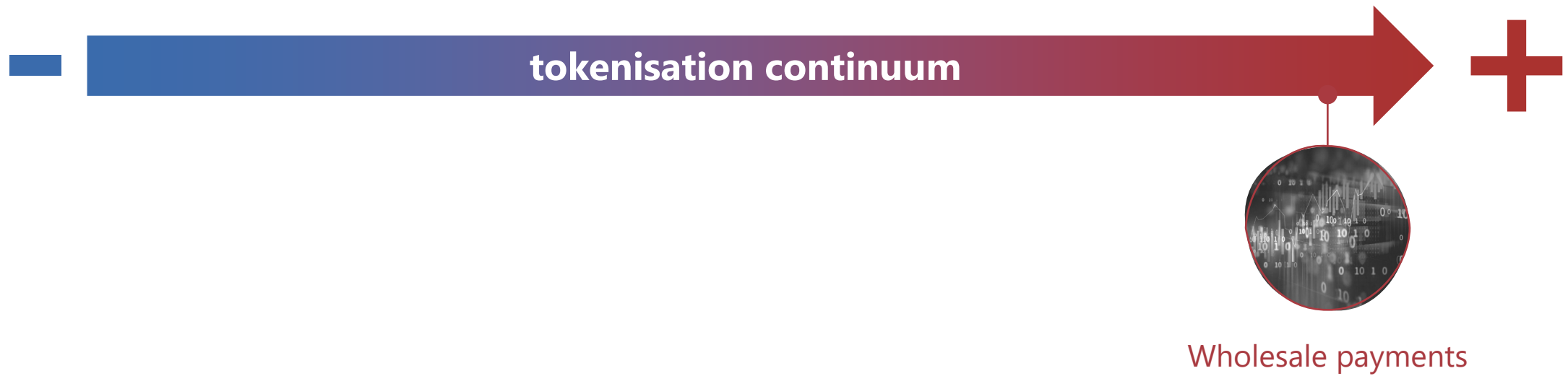
$$C(A) = A$$

Tokenisation continuum



The tokenisation continuum (Aldasoro et al, 2023)

Tokenisation continuum



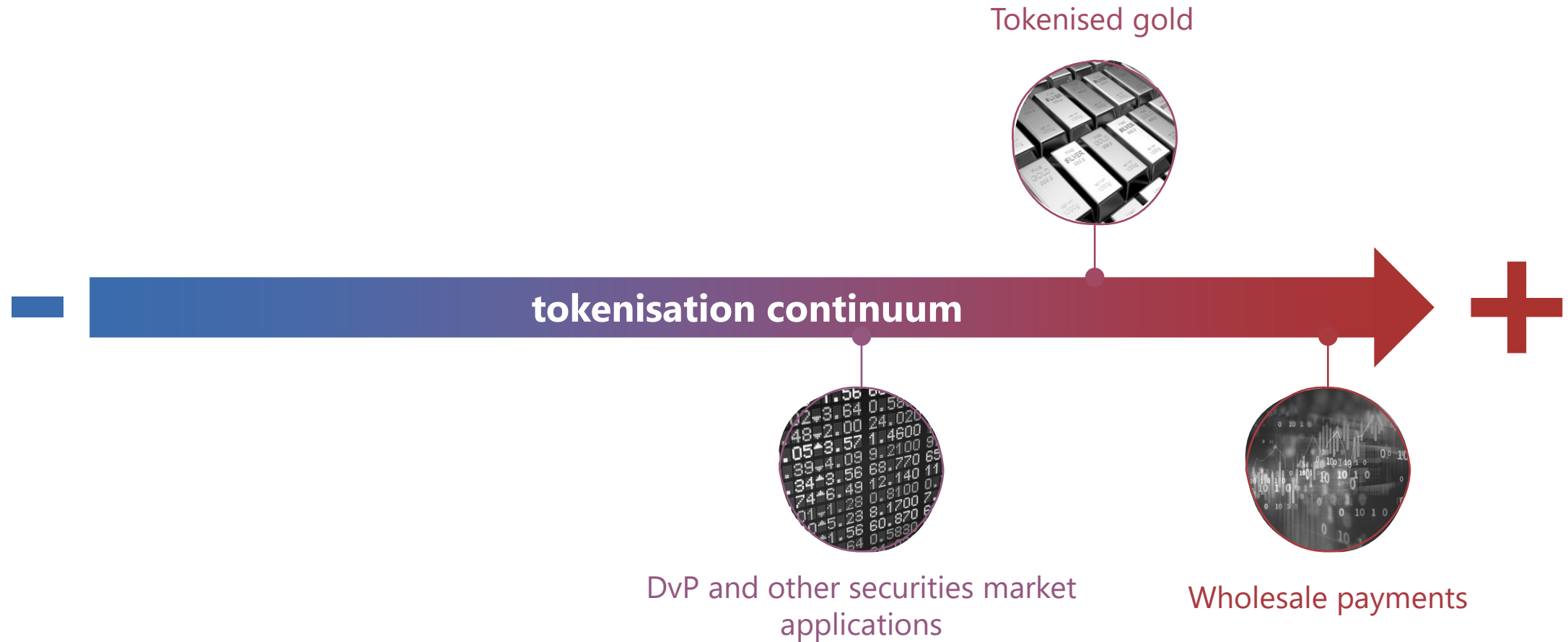
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Tokenisation continuum



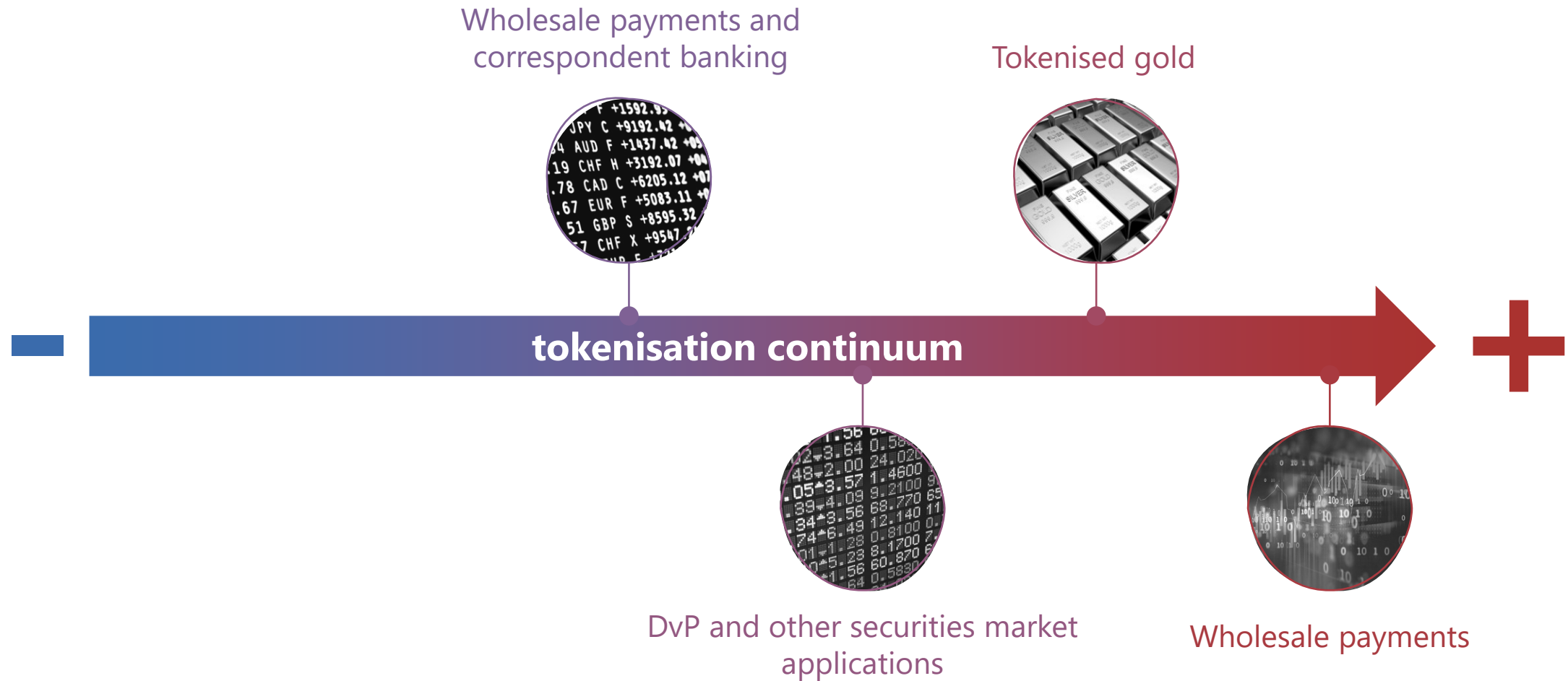
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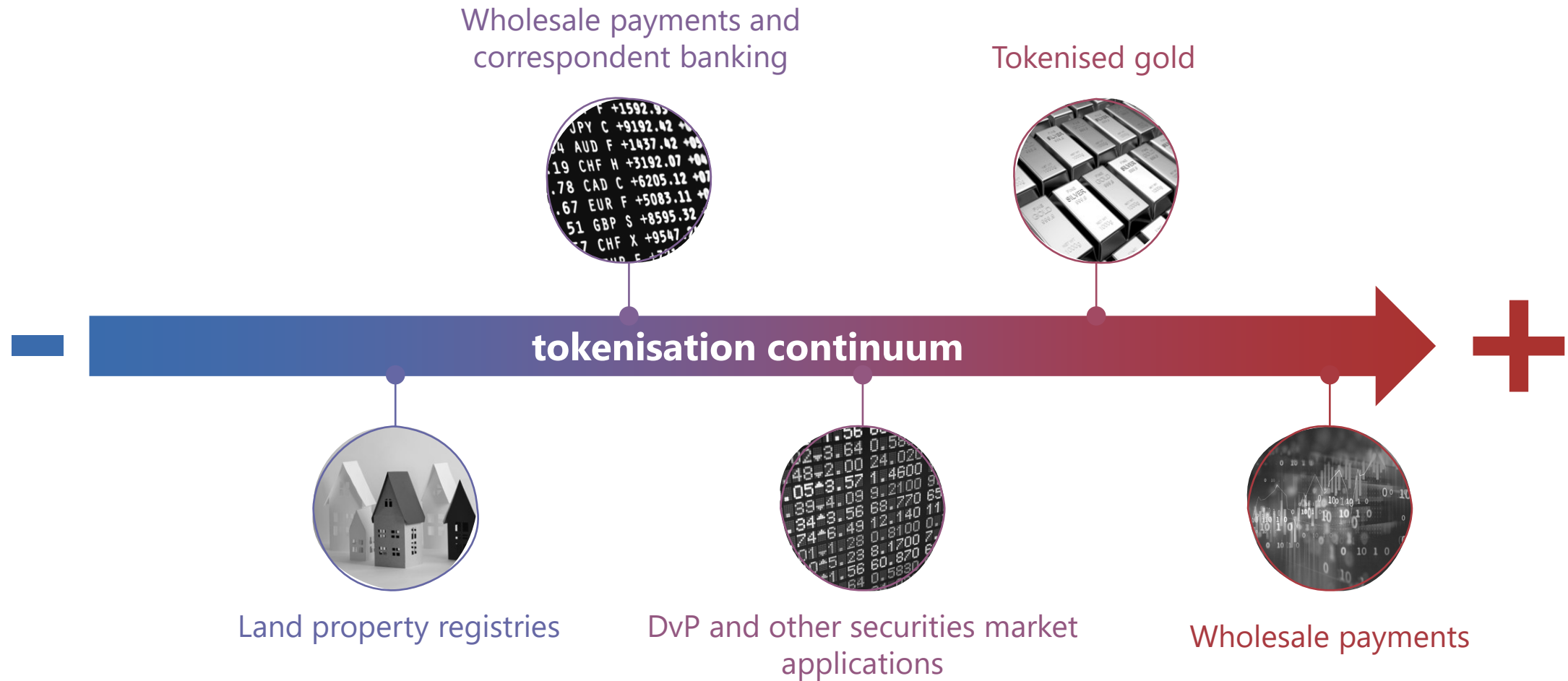
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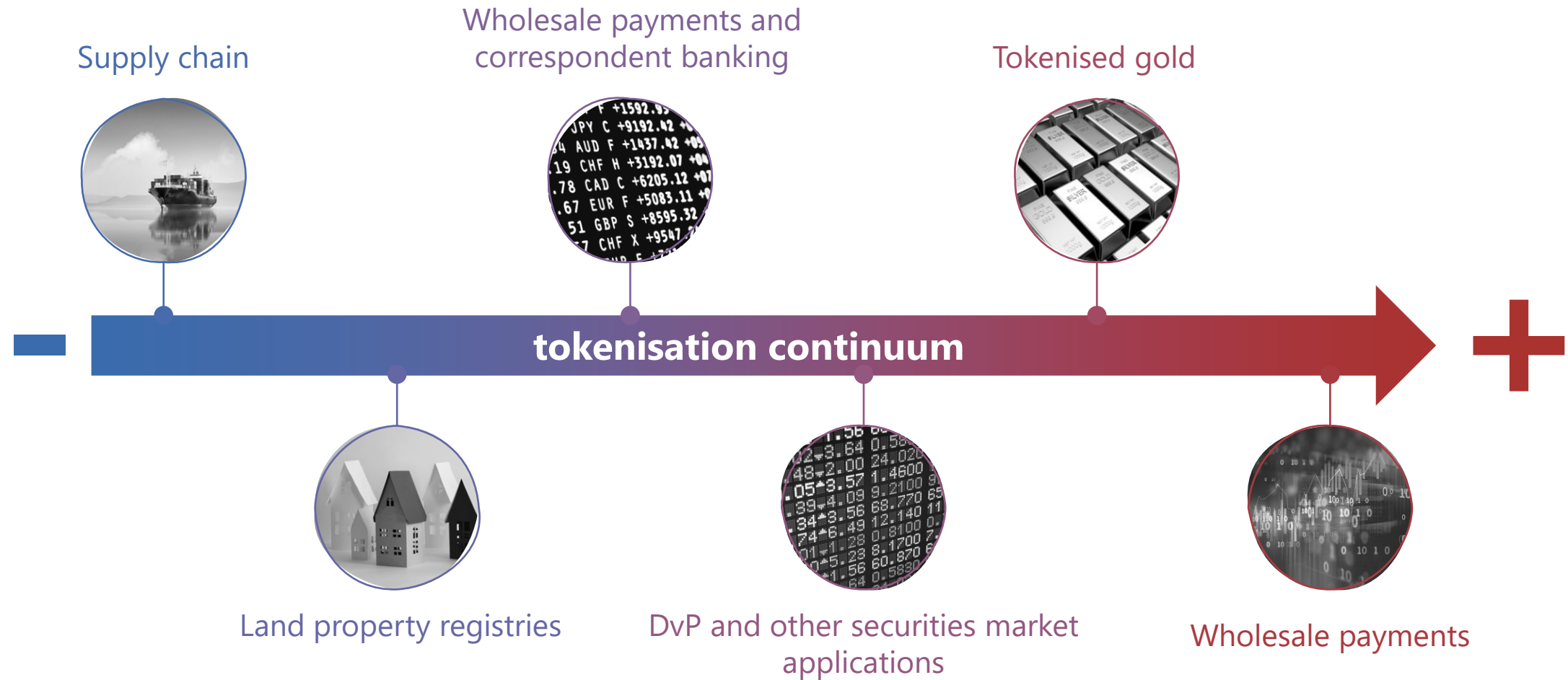
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