The decentralisation of finance – and paths forward

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*The views expressed here are those of the authors and not necessarily of the BIS.

Is finance becoming decentralised? And what does that mean?

- Since 2009, the rumblings around cryptocurrencies have risen gradually, then suddenly

- Cryptocurrencies are a type of private asset that depends primarily on cryptography and distributed ledger or similar technology as part of their perceived or inherent value (FSB, 2019)

  - Distributed ledger technology (DLT) is a means of saving information through a distributed ledger, ie a repeated digital copy of data available at multiple locations (BIS, 2022)

  - Stablecoins are a type of cryptocurrency that aims to maintain a stable value relative to a specified asset, or a pool or basket of assets (Arner et al, 2020)

Image source:
Amazon.in

Is finance becoming decentralised? And what does that mean?

- DLT applications in decentralised finance (DeFi) aim to provide financial services without using centralised entities – fundamentally different from traditional finance (TradFi)

- Yet in practice, DeFi platforms often have quite centralised decision making, and new forms of concentration. Some refer to a "decentralisation illusion" (Aramonte et al, 2022)

Image source:
BIS

Image source: [Bitcoin Genesis Block Explained & Its Impact on Finance](#)

Bitcoin: A Peer-to-Peer Electronic Cash System

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Abstract. A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

1.   Introduction

Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments. While the system works well enough for most transactions, it still suffers from the inherent weaknesses of the trust based model. Completely non-reversible transactions are not really possible, since financial institutions cannot avoid mediating disputes. The cost of mediation increases transaction costs, limiting the

Image source:
https://bitcoin.org/bitcoin.pdf

5

"Decentralisation" in practice

Image source: Wikimedia Commons

Stablecoin market capitalisation is surging
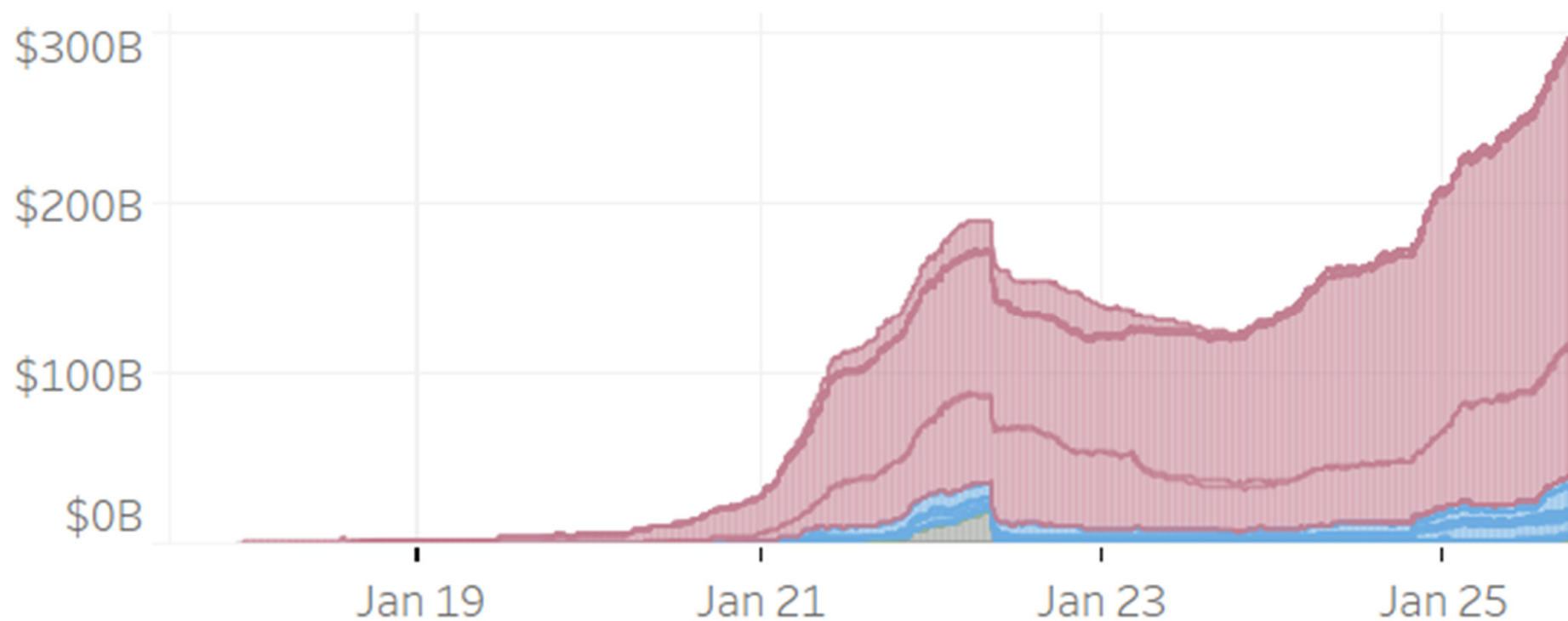
A Cambrian explosion of competing blockchains

% of total assets locked

Layer 1 networks:
- Ethereum
- Terra
- BSC
- Avalanche
- Fantom
- Solana
- Tron

Other layer 1 and 2 networks
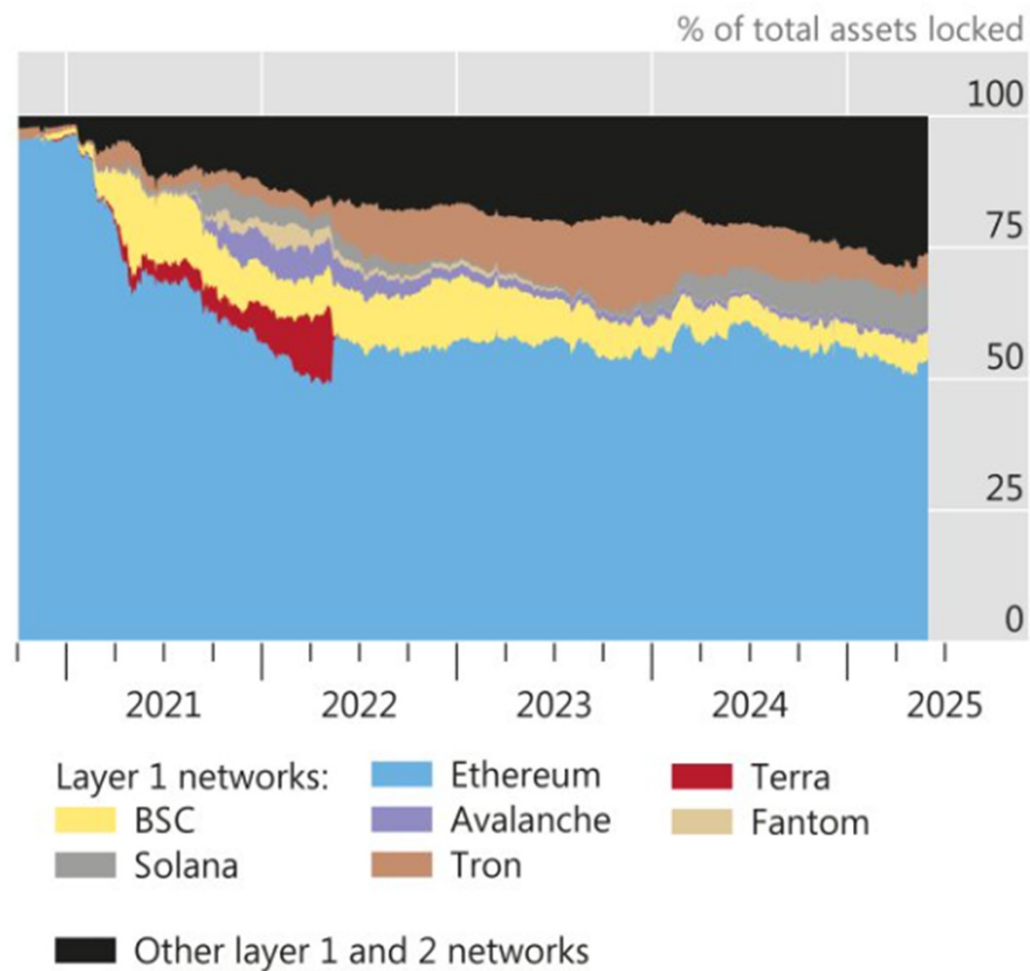
Rapid growth in tokenisation of "real-world assets" (RWA)

Legend:
- Private Credit
- non-US Government Debt
- Actively-Managed Strategies
- US Treasury Debt
- Stocks
- Institutional Alternative Funds
- Corporate Bonds
- Commodities
- Private Equity
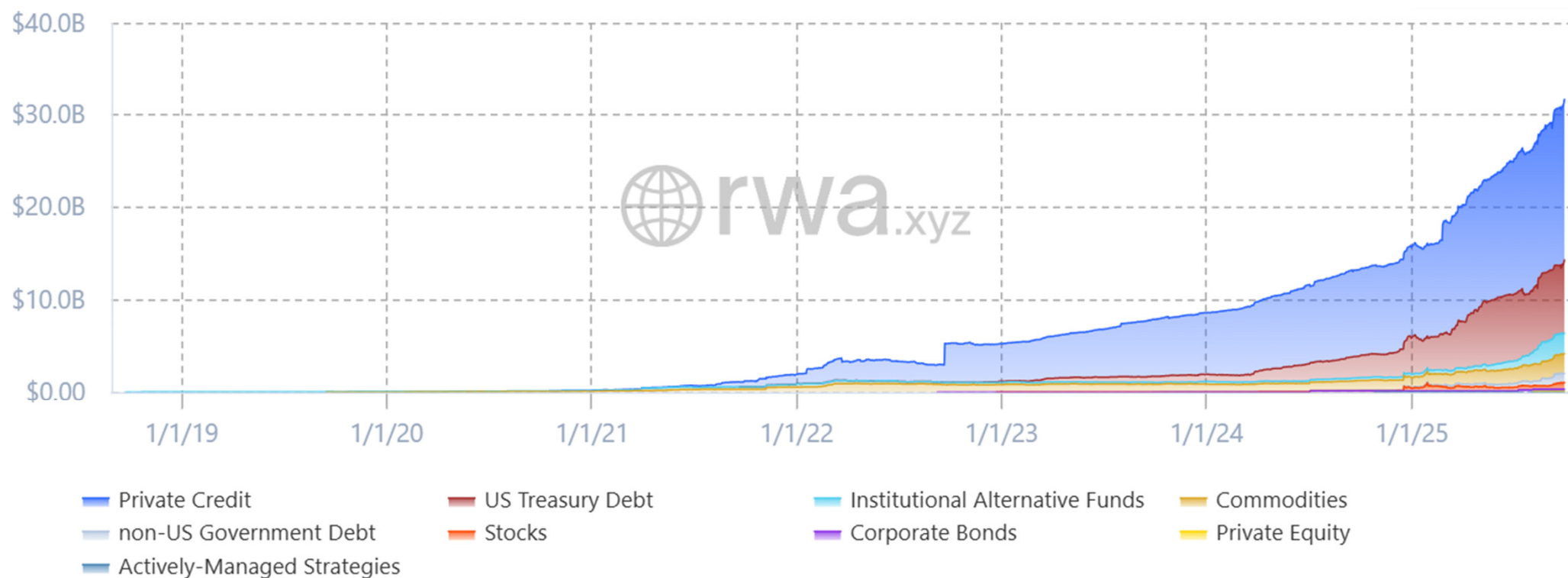
Source: rwa.xyz (2025)

Yet in finance as in so many domains, there is nothing new under the sun

Economic functions and activities in TradFi and DeFi

Function	TradFi example	DeFi example
Clearing and settling payments to facilitate trade	Payment systems, deposit accounts, e-money, cards, central counterparties	Bitcoin network, other blockchains (eg Ethereum, Solana), stablecoins, automated market making (AMM)
Pooling of funds to undertake large-scale enterprises	Stocks, bonds, mutual funds, exchange-traded funds (ETFs)	Asset management DApps, DeFi tokens, governance tokens
Transfer economic resources though time and space	Loans, mortgages, pension funds, mutual funds, etc	Lending DApps, flash loans, asset management DApps, smart contracts
Manage uncertainty and control risk	Loans, insurance contracts, derivatives, hedging strategies	DeFi insurance, derivatives, hedging strategies, smart contracts
Provide price information to coordinate decentralised decision making	Exchanges, trading activities, derivatives	DEXs (and CEXs), AMM, trading activities, crypto derivatives
Deal with incentive problems	Risk management, repeated interactions with the same known counterparties	Smart contracts, overcollateralisation

Source: Aquilina et al (2023b)

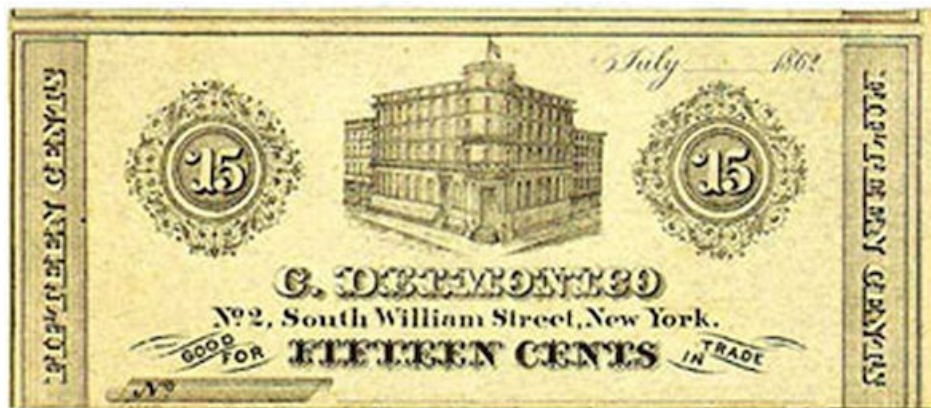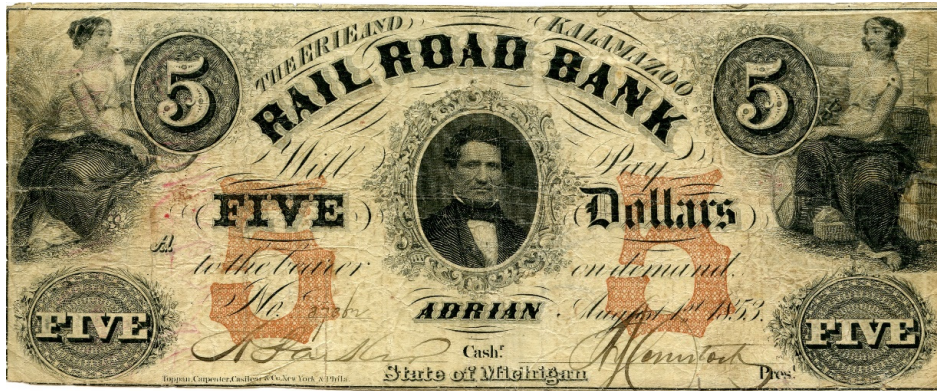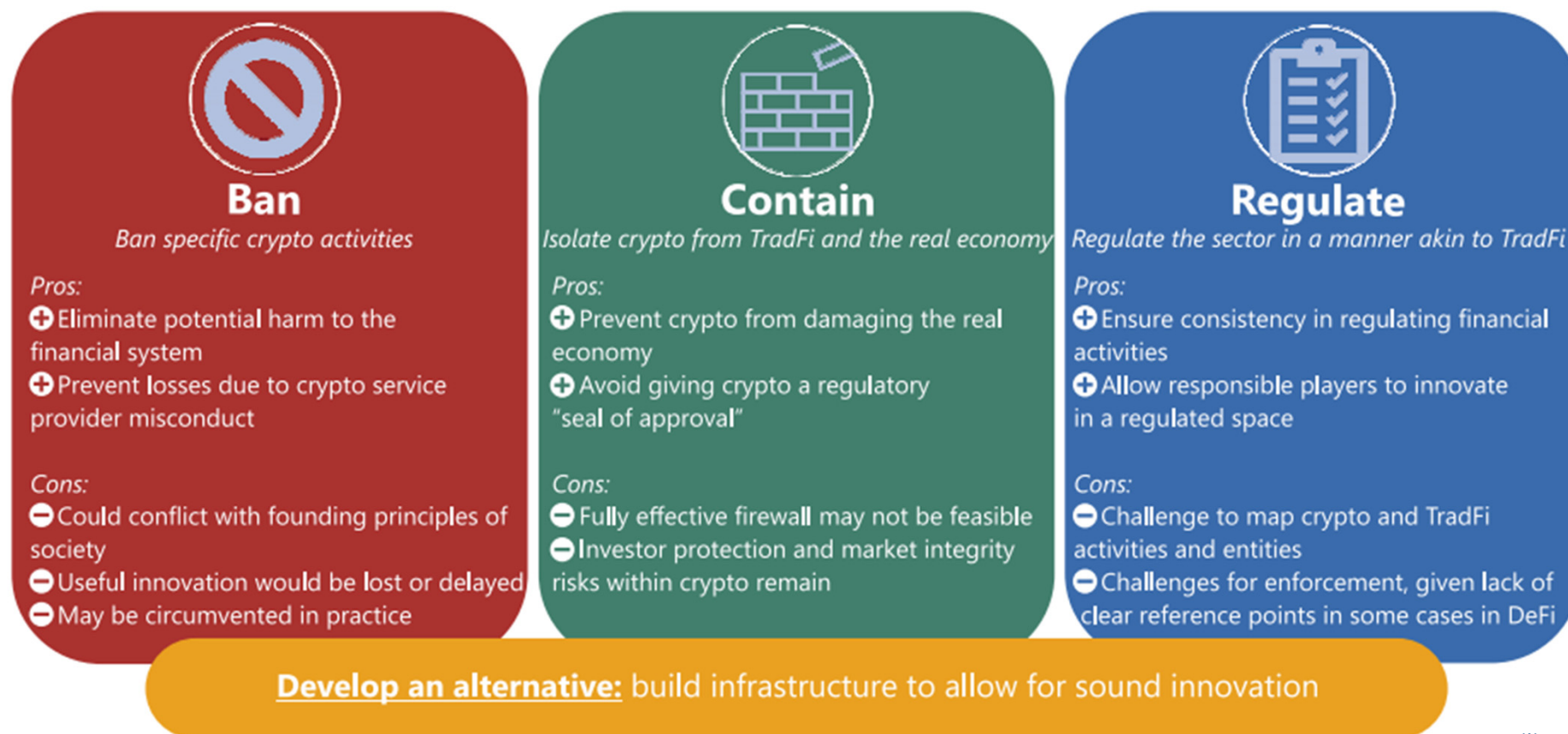# Stablecoins as a return to the 19th century US Free Banking era?

Need for private institutions like the Suffolk System (1818–58)?

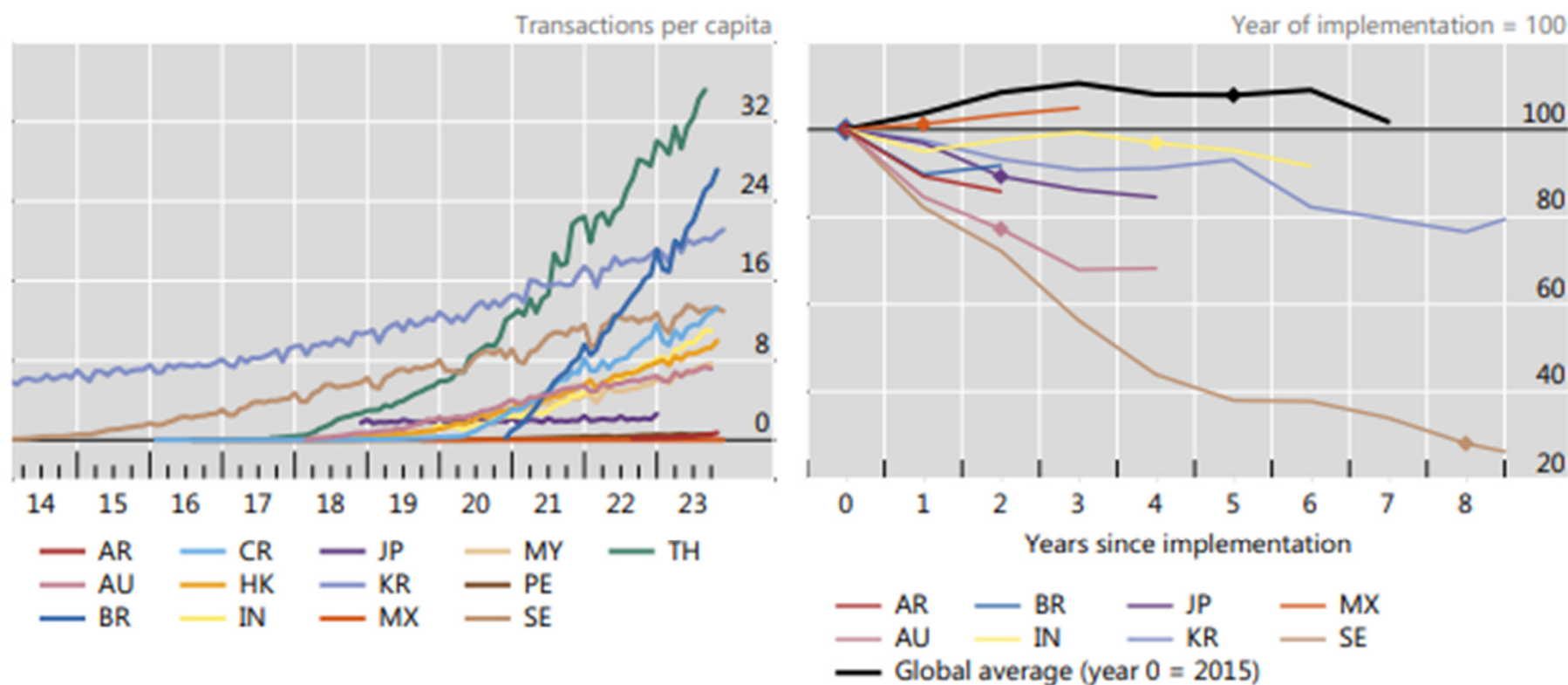Image source: American Currency - CURIOSity Digital Collections.

How should authorities respond to the rise of crypto and DeFi?

High-level options for addressing risks in crypto

Ban
Ban specific crypto activities

Pros:
⊕ Eliminate potential harm to the financial system
⊕ Prevent losses due to crypto service provider misconduct

Cons:
⊖ Could conflict with founding principles of society
⊖ Useful innovation would be lost or delayed
⊖ May be circumvented in practice

Contain
Isolate crypto from TradFi and the real economy

Pros:
⊕ Prevent crypto from damaging the real economy
⊕ Avoid giving crypto a regulatory "seal of approval"

Cons:
⊖ Fully effective firewall may not be feasible
⊖ Investor protection and market integrity risks within crypto remain

Regulate
Regulate the sector in a manner akin to TradFi

Pros:
⊕ Ensure consistency in regulating financial activities
⊕ Allow responsible players to innovate in a regulated space

Cons:
⊖ Challenge to map crypto and TradFi activities and entities
⊖ Challenges for enforcement, given lack of clear reference points in some cases in DeFi

Develop an alternative: build infrastructure to allow for sound innovation

Source:
Aquilina et al (2023a)

Public infrastructures can be very powerful

Transactions per capita

Year of implementation = 100

Years since implementation

Legend (left chart): AR, AU, BR, CR, HK, IN, JP, KR, MX, MY, PE, SE, TH

Legend (right chart): AR, AU, BR, IN, JP, KR, MX, SE; Global average (year 0 = 2015)

[1] Monthly data. See technical annex for details.   [2] Banknotes and coins in circulation are shown as a percentage of narrow money, except for KR for which currency in circulation/narrow money is shown. The markers indicate the year of the Covid-19 pandemic, 2020, except for KR, which shows only eight years after 2009.
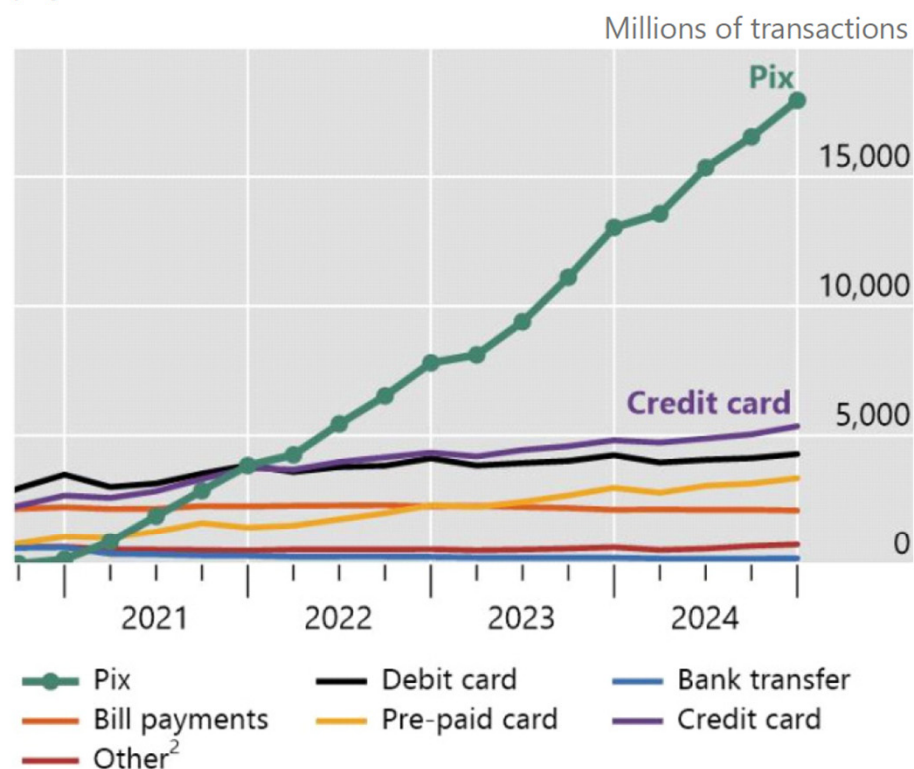
Source:
Frost et al (2024)

In Brazil, for example, Pix has driven a digital payments revolution
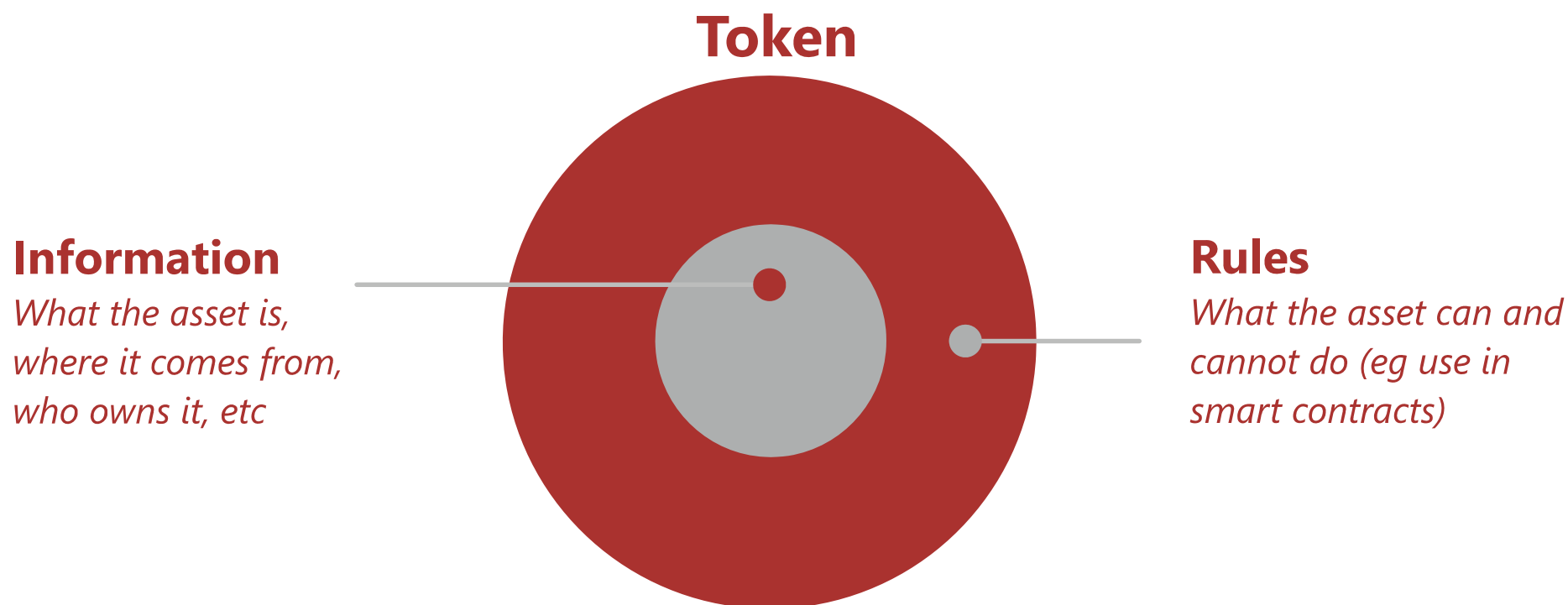
A. Users and transaction value have risen rapidly
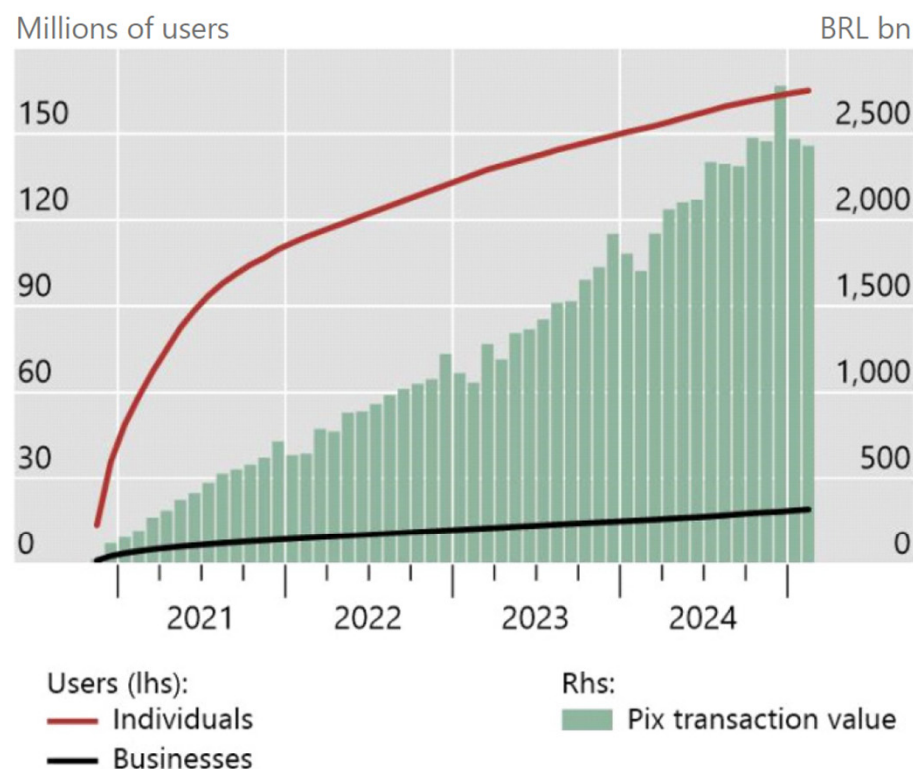
B. Pix is gaining market share rapidly in a growing digital payments market[1]

[1] Number of transactions for each payment instrument, excluding recurrent utility payments.   [2] Includes cheques.
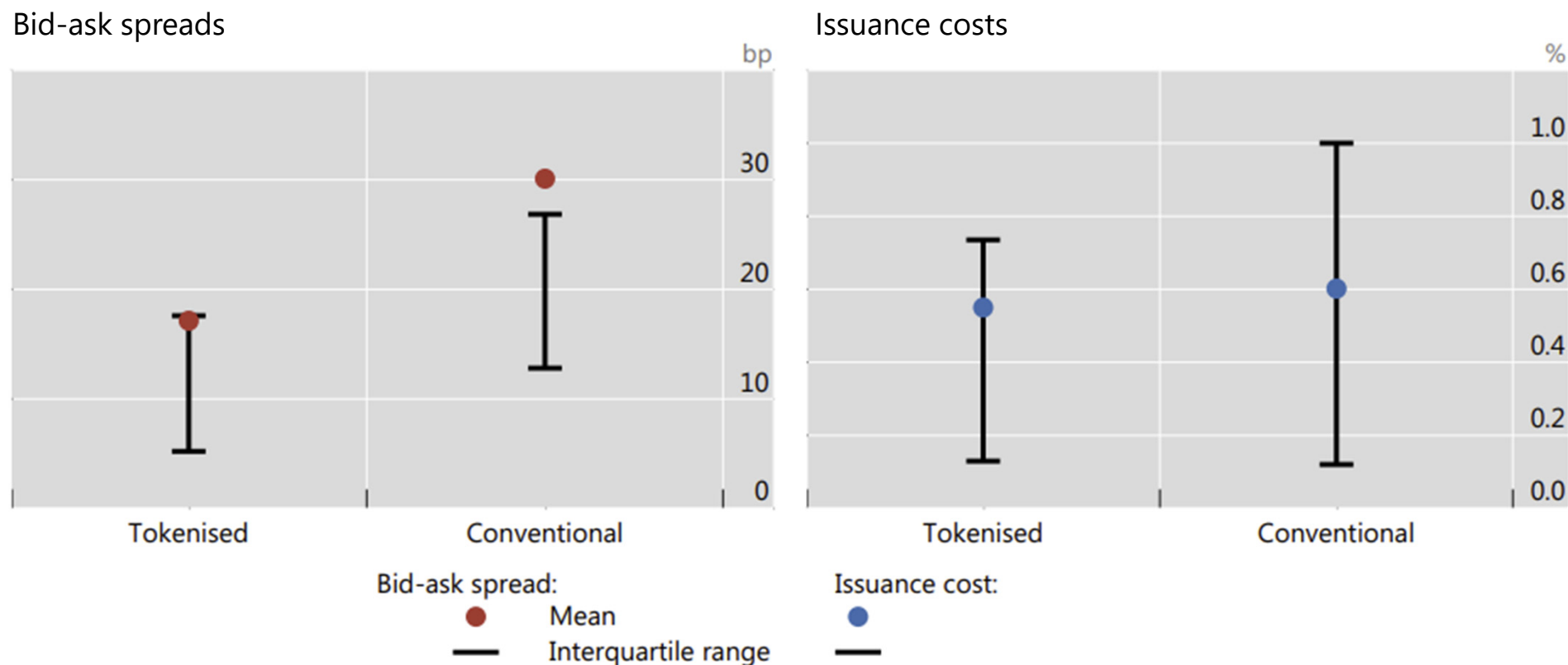
Source: Duarte et al (2022), updated as of August 2025.

Tokenisation as one powerful technological capability

Token

**Information**

What the asset is, where it comes from, who owns it, etc

Rules

What the asset can and cannot do (eg use in smart contracts)

Source: BIS

BIS

Tokenised bonds exhibit improved liquidity, and comparable issuance costs
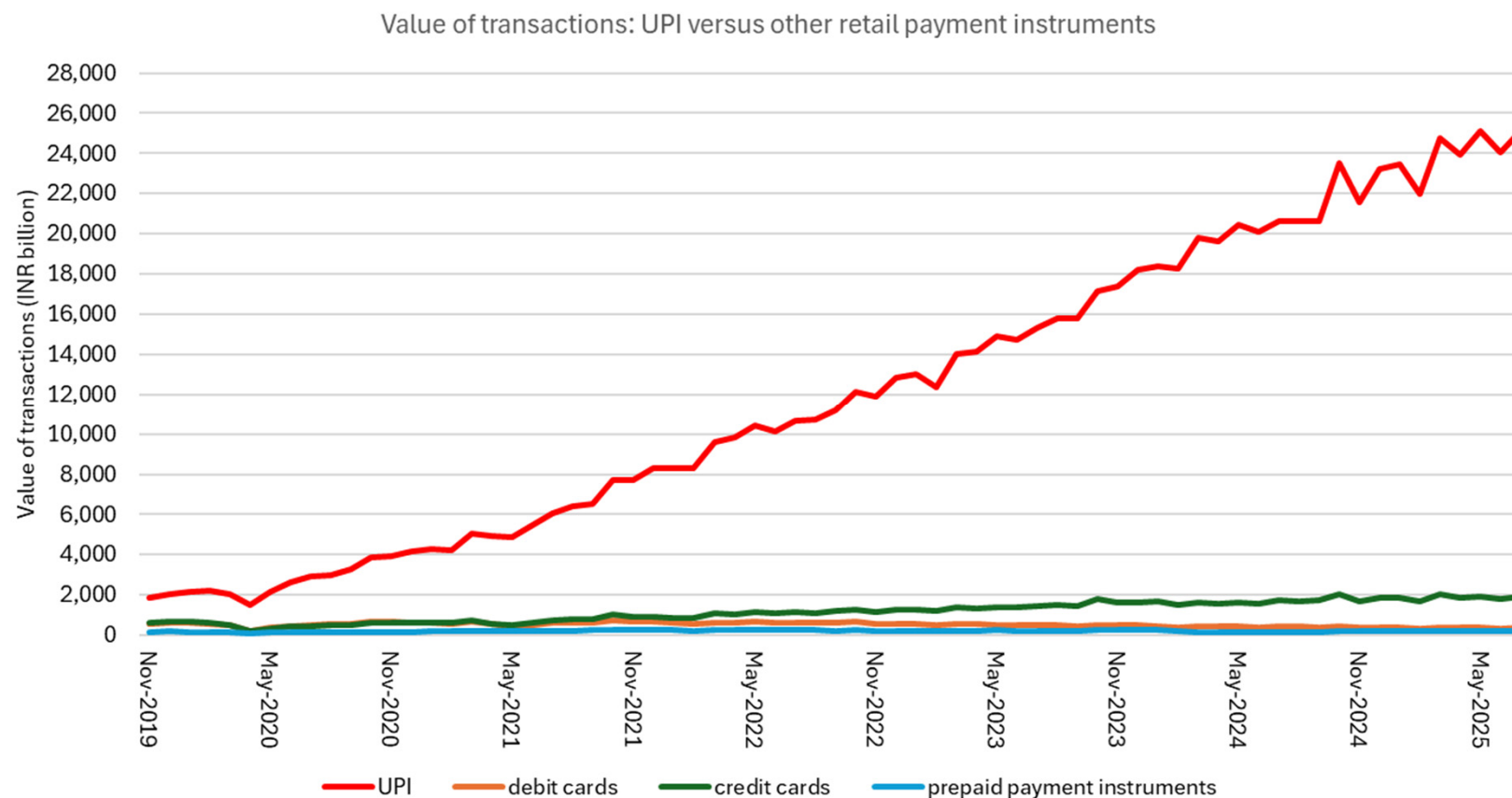

Bid-ask spreads

Issuance costs

Source: Aldasoro et al (2025).

Concluding remarks

- Decentralised finance is a misnomer, but it is growing fast and here to stay

- Rapid growth puts a premium on real-time monitoring and decision making

- Among policy approaches, "ban" and "contain" are increasingly untenable; the question is not whether but how to regulate – and what to do when things go wrong

- The biggest enemy of innovation is not regulation; it is crises and the resulting erosion of trust

- There is path dependency: what we choose now matters for years to come

- Should public authorities delegate responsibility to the private sector? Or lead with public infrastructures that lay a foundation for financial development?

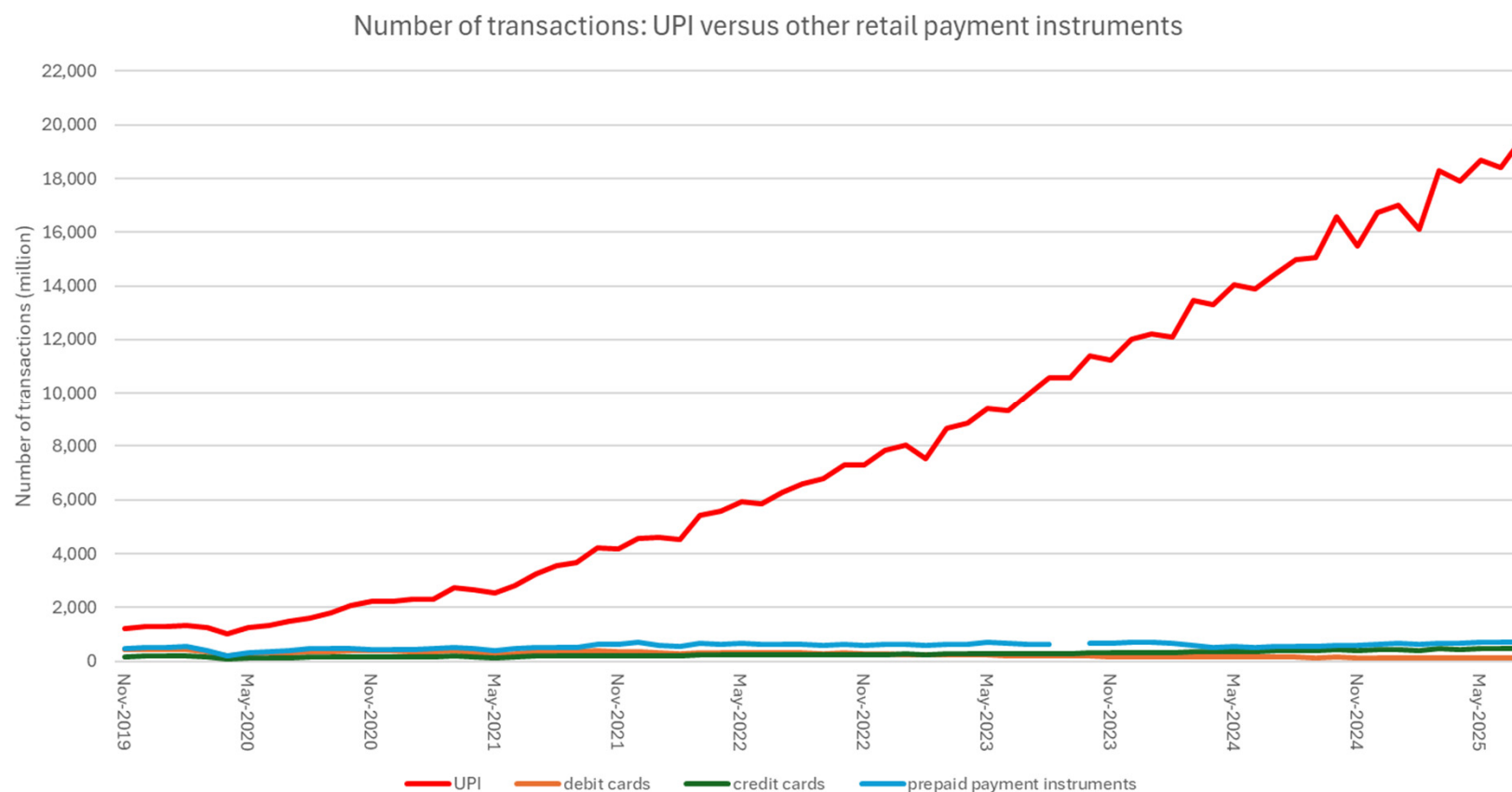- Fast payments and tokenised government bonds as two examples
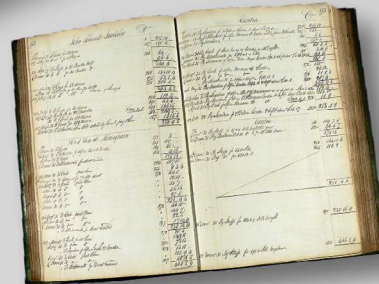
In India, UPI is far more widely used than other digital payment methods...

Value of transactions: UPI versus other retail payment instruments

…with similar trends based on transaction volume (number of transactions)

Number of transactions: UPI versus other retail payment instruments

Source: NPCI; RBI; with thanks to Kumar Rishabh.

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