



Princeton University | Bendheim Center for Finance

# Banco Central do Brasil's Innovation Agenda

The Future of Financial Intermediation

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# Digital world transformation



- People are looking for a digital representation of value
  - Assets are becoming encrypted
  - Distributed ledgers allow assets to be verifiable and transferable, with divisibility
  - We are talking about extracting value from an asset in its digital form
    - Art, pictures, properties, ideas and even money
- Are we moving towards a tokenized economy?

If the tokenization thesis holds true then the 21st Century may see the creation of regulated, global, token-based, multi-asset networks.\*

\* The Regulated Internet of Value, Citi's Digital Policy, Strategy and Advisory, 06/21.



# Tokenization of the economy

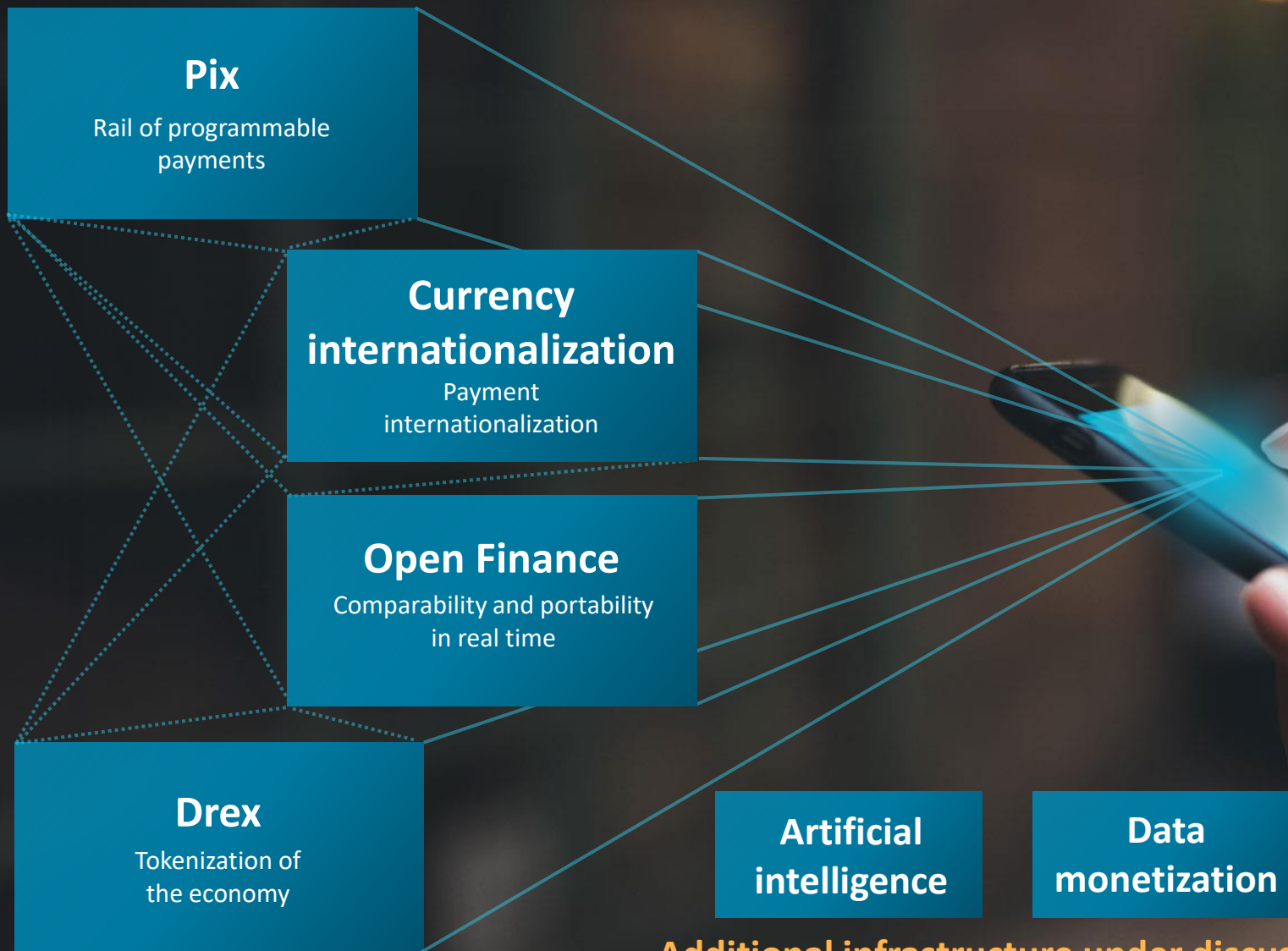
## TOKEN



- The main change is the tokenization of assets for trading
- Asset tokenization generates efficiency gains
  - Trade, register, contracts, collaterals etc.
  - Greater speed and transparency
  - Lower cost
  - More open processes
  - Programmability in the purchase and sale of assets

# An integrated agenda

Four fundamental blocks



Additional infrastructure under discussion

# Through the lenses of a CBDC



- Digital life → Digital payments
- Central Bank Digital Currencies (CBDCs): response of central banks to the need of exerting its mandate in a digital environment.
- Retail payments
  - CB reserves, wide access, fast payments
  - Literature: Andolfato (2018), Brunnermeier (2019), Guardado (2020), Kumhof (2021), Niepelt (2023)
  - Bank disintermediation?
- Platform economy
  - Beyond payment, financial services, cross border
  - Literature: Carstens and Nilekani (2024), Brunnermeier and Payne (2023), Schär (2021)
  - Tokenization?



# Platform for tokenized digital assets



- Open Finance helps us to advance toward a platform economy
  - Initial steps
- Tokenization can further these developments
  - Digital Public Infrastructure
- These innovations can bring gains in efficiency, safety, financial inclusion, and innovative business models.
- The programmable finance environment, based on tokenized assets, must be interconnected with other private and public infrastructures.
  - Interoperability and composability

# How to tackle these problems?



**Retail payments**

# Pix



Final step towards a synthetic CBDC

- e-money
- universalization of access
- common payment rail

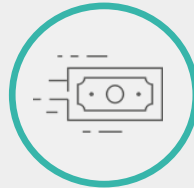
Empirical evidence



Theoretical studies



Establish **rail of programmable payments**



**Democratize** the access to digital means of payment and **make things easier** for payers and payees



Enable **new business models and innovations in companies' payment processes**



**Reduce** costs



Contribute to payment **digitalization** and financial **inclusion**



Boost **competition** and increase **efficiency**

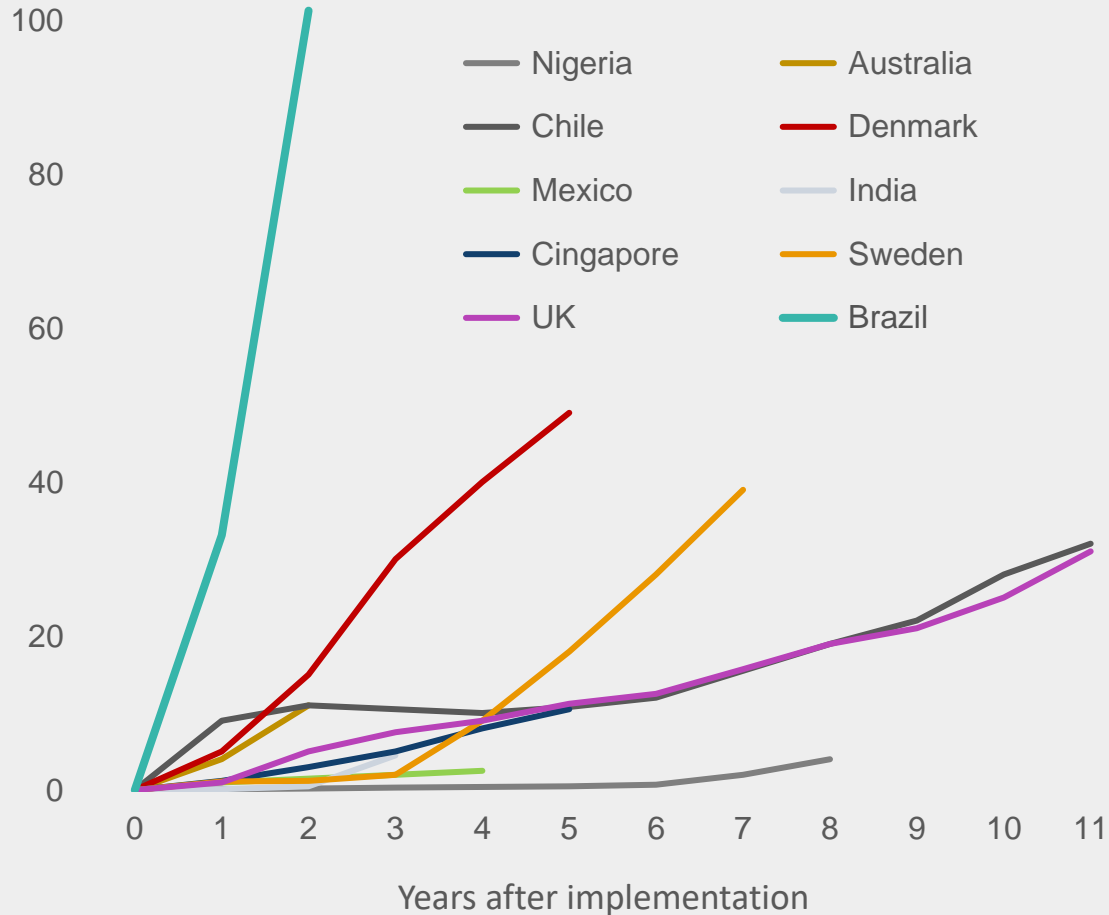


# Pix gains space and increases its popularity



Pix growth promotes financial inclusion and enables small businesses

## Per capita transactions – by countries



## Pix growth

**789 million** active Pix's keys.

**153,1 million** people and **16,0 million** companies use Pix.



**224.2 million** operations in one day

**5.6 billion** transactions in Aug/24, against **3.8 billion** in Aug/23, **increase of 50%.**

# Pix gains space and increases its popularity

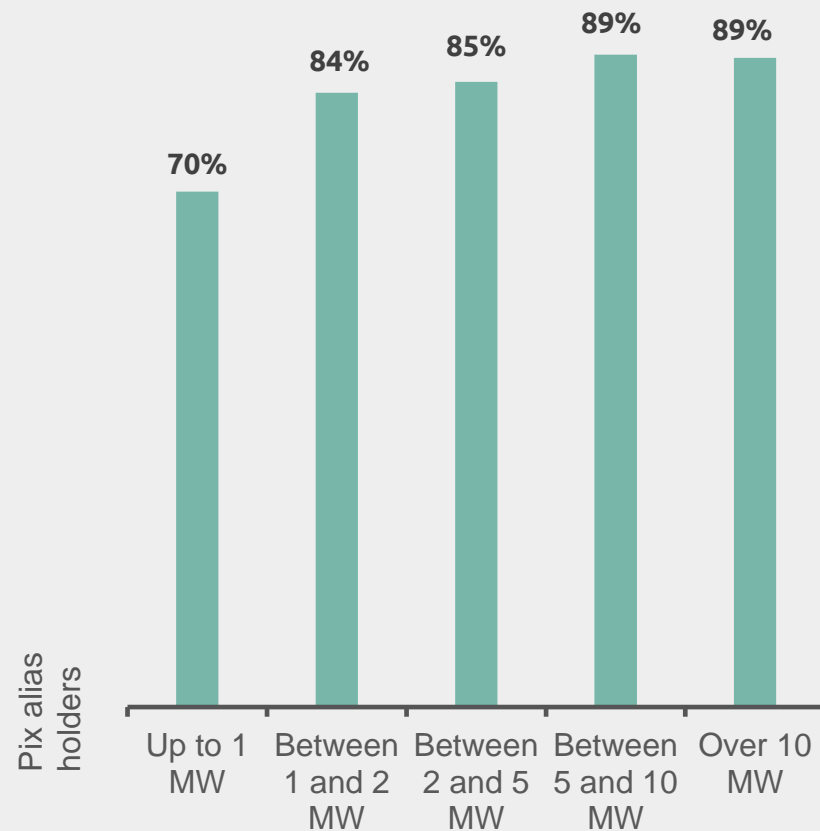


Pix growth promotes financial inclusion and enables small businesses

## Pix and financial inclusion

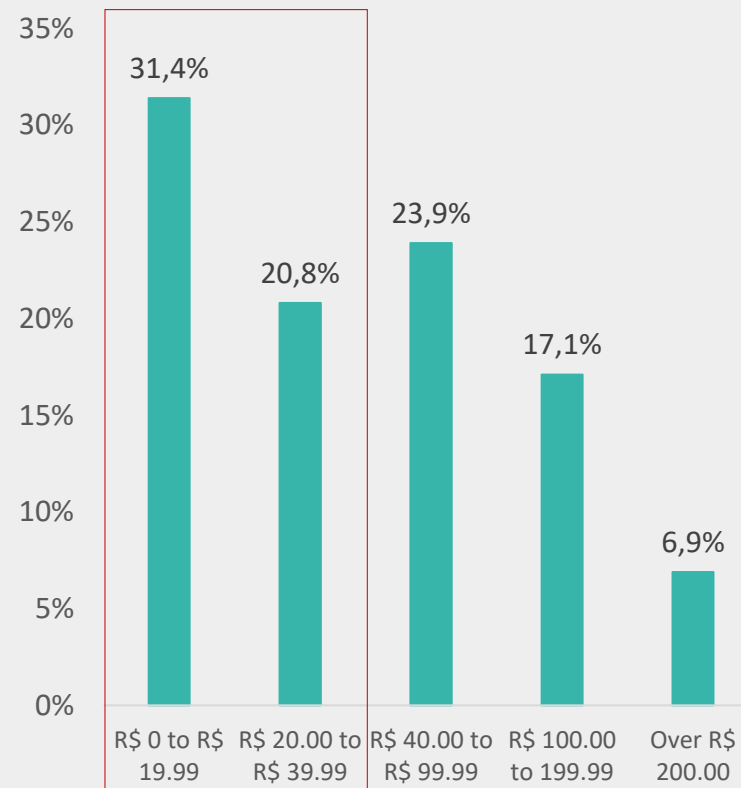
- 71.5 million new users included with Pix.\*

### Pix transactions per income level

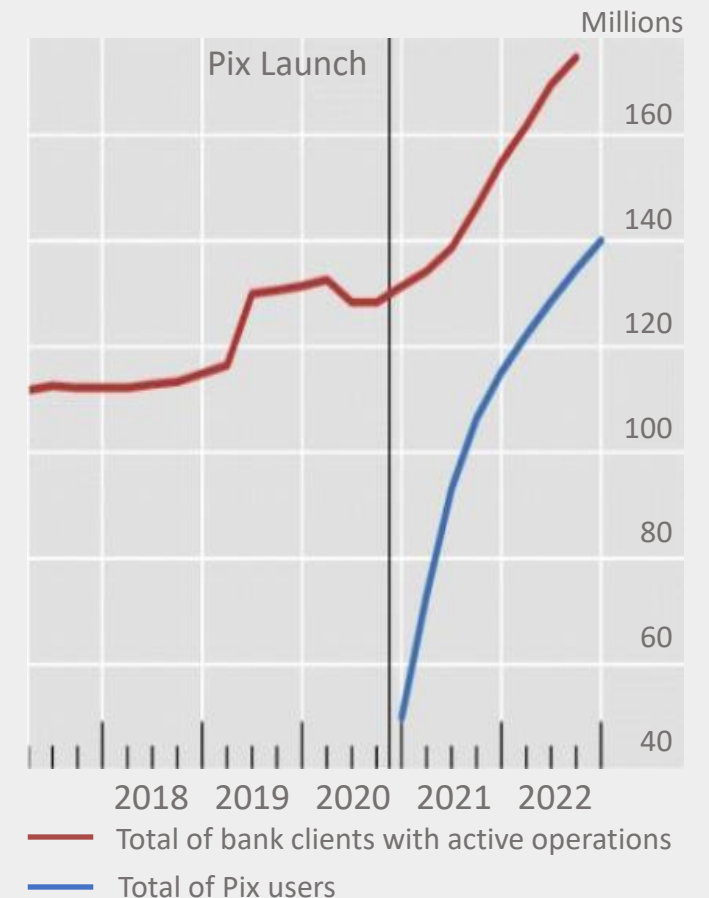


### Transactions by value range

(Only natural persons payers)



### Pix users vs. Bank clients



Sources: BCB, BIS.

\* Considering users who did not use TED in the 12 months prior to the launch of Pix and became PIX users.

# Pix new functionalities



**Pix**



**Pix Agendado**

(Scheduling)



**Pix Cobrança**

(Future dated billing)



**Pix Saque  
Pix Troco**

(withdrawal and change)



**MED**

(Mechanism for return)

## What comes next



**Pix Automático**

(Recurring payments)



**Pix Aproximação**

(Contactless Pix)



**MED 2.0**





# How to tackle these problems?



**A platform view**  
cross border

# Currency internationalization

Three challenges for the connection of international payments systems:

- **Technology**
  - Connection between DLT and centralized systems (solutions are available)
- **Settlements**
  - Liquidity token pool (solutions are available)
- **Governance**
  - Taxonomy (minimal rules for cross-border payments)
    - We need to advance on the topic
  - XC Platform – Adrian, T. et al. (2022)



# How to tackle these problems?

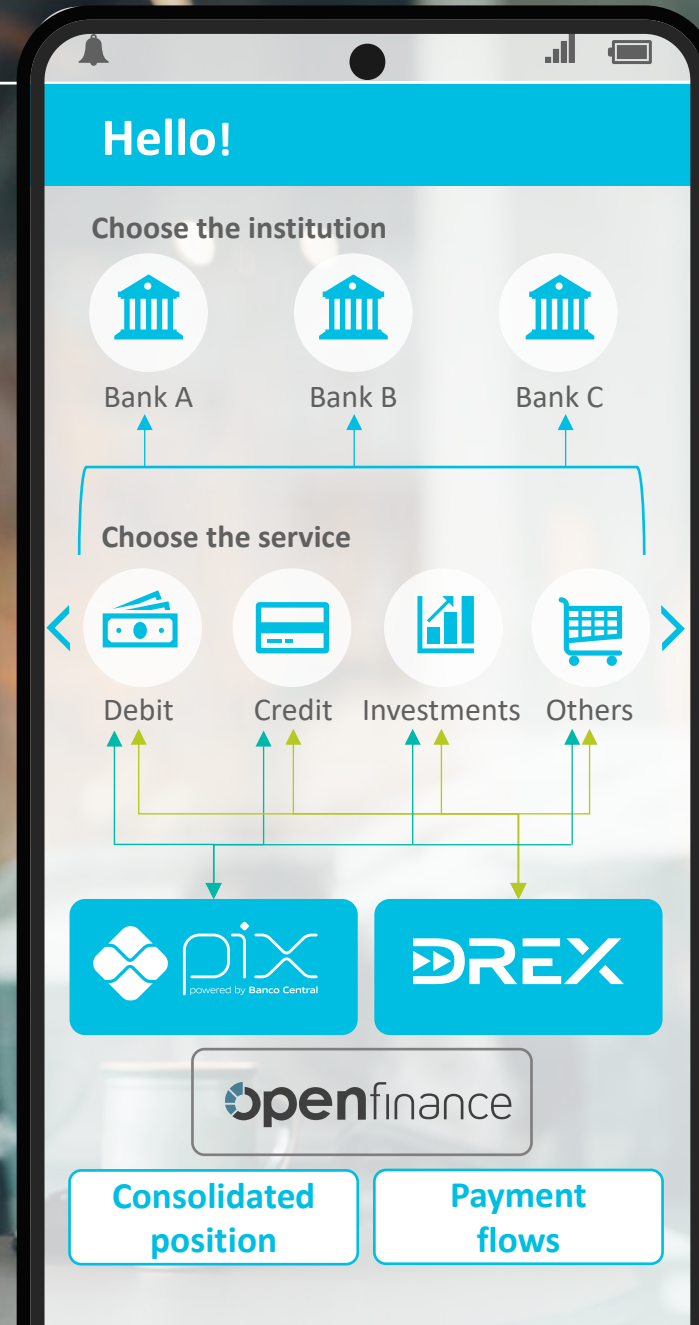


**A platform view**  
domestic services



# Financial services aggregator

- Marketplace environment
- Competition by channel and for principality



Offline

Online

Data wallet

# How to tackle these problems?



**A platform view**  
current technology

Open Finance





### Benefits:

- Greater efficiency in processes.
- More customized products and services.
- Easier credit and salary portability.
- More convenient and programmable transfers.
- Reduced interest payments for overdraft users.
- Financial aggregators and managers for individuals and companies.
- Easier customer onboarding.

➡ Open Finance plus CBDC speeds up tokenization.



# Comparability and portability in real time

## Examples of benefits of the Open Finance:

Reports from participant institutions (traditional banks, fintechs and credit unions)

### Overdraft facility:

- R\$ 8 million in savings from paying overdraft interest at another financial institution in the first twelve months.

### More efficiency in credit operations:

- R\$ 2.5 million in personal loan through lower rates.
- Credit card offered to 1.3 million clients, who did not have access to the facility.
- R\$ 1.2 billion credit via loan portability, with a 61% effectiveness gain during the process.
- + R\$ 240 million in credit recovery.
- Analysis of data shared via Open Finance already results in 80% of credit origination for new sellers.
- R\$ 1 billion in credit origination.

### Improved financial management:

- + 9 million clients using management tools.
- 4 million customers engaged in consolidated financial management, with 47 million accesses.

### Easier account opening process (onboarding):

- Reduction from 32 hours to 2h10m in the account opening process based on information obtained within the scope of Open Finance.
- 34% growth in account opening requests.

### Better investment performance:

- R\$ 1.5 billion in more profitable investments for clients.
- 2.6 million clients been notified that their idle funds on another institution could be earning interest.

## Timeline

**July 31, 2024**

Specific regulation for non-redirect payment journey

**November 14, 2024**

Testing in production

**February 28, 2025**

Launching to the population

**BC launches rules for contactless Pix and defines new governance structure****Non-redirect payment journey**

- Changes that enhance customers' experience in the payment initiation journey, enabling:
  - Contactless Pix payment via wallet
  - More convenience in online payments
- Customers will be able to choose their institution, add their account to their preferred digital wallet, and save it to make in-person payments with contactless Pix, just as is done with cards.
- Furthermore, customers will no longer need to leave the online shopping environment, in e-commerces, to make the payment.

# How to tackle those problems?



**A platform view**  
moving ahead

Drex



# DeFi markets: an inspiration for Drex

## Tokenization of the economy

### Opportunities

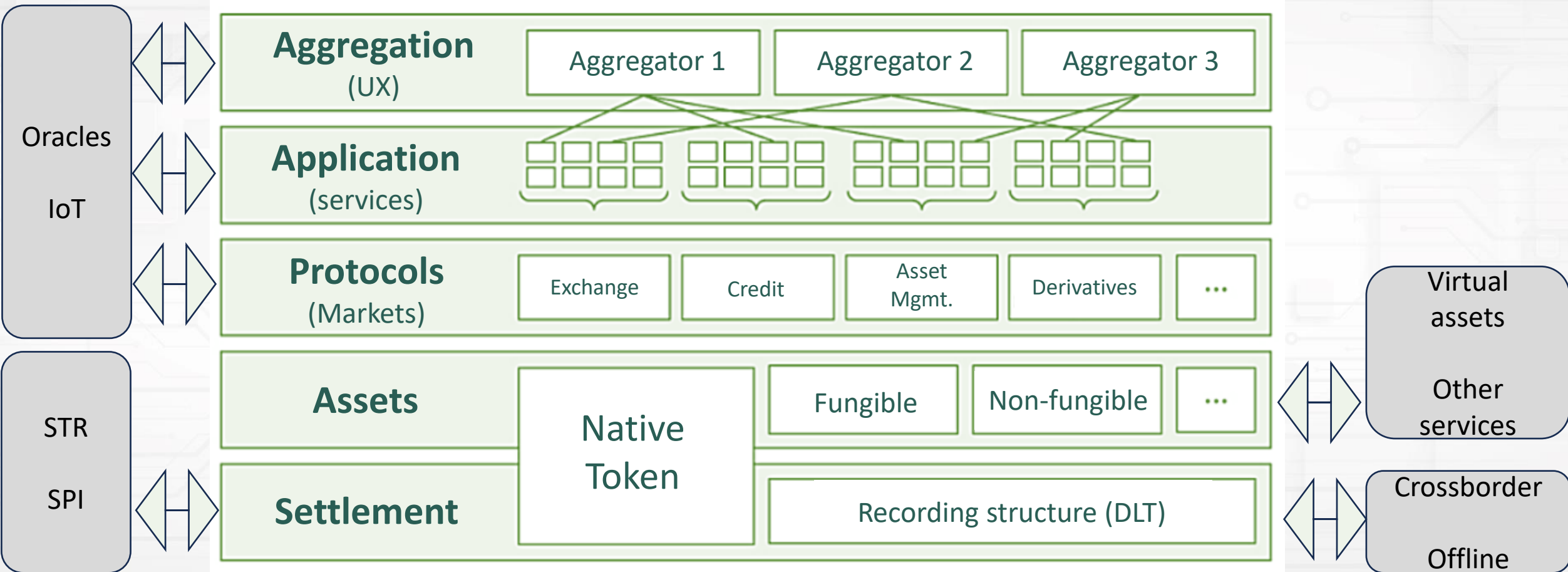
- Reduced transaction costs and friction for:
  - designing, distributing, negotiating and settling financial deals
- High degree of
  - standardization and functional interoperability, reuse and composability of financial services
  - auditability, traceability and transparency
  - accountability: software-based governance
- Financial inclusion
  - automatic tools available to everyone, with transparency and non-discriminatory execution

### Challenges

- Scalability and settlement fees
  - blockchain platforms are limiting
- Limited interoperability
  - blockchains ↔ traditional financial services
- Lack of maturity
  - Governance: potential for facilitating the crime of money laundering
  - Technology: Operational risks, poor implementation choices, failed software execution and interdependencies

# DeFi markets: an inspiration for Drex

A platform for smart settlement



## Benefits in three dimensions:

### 1. Banking efficiency

- To introduce the concept of tokenization
  - Risk management, collateral, financing, asset management, data analysis, settlement and products

### 2. Efficiency in digital payments

- Bridge to De-Fi environment
  - To bring decentralized finance into the regulatory perimeter
- Efficiency in financial intermediation

### 3. Efficiency in contracts (register) and reconciliation

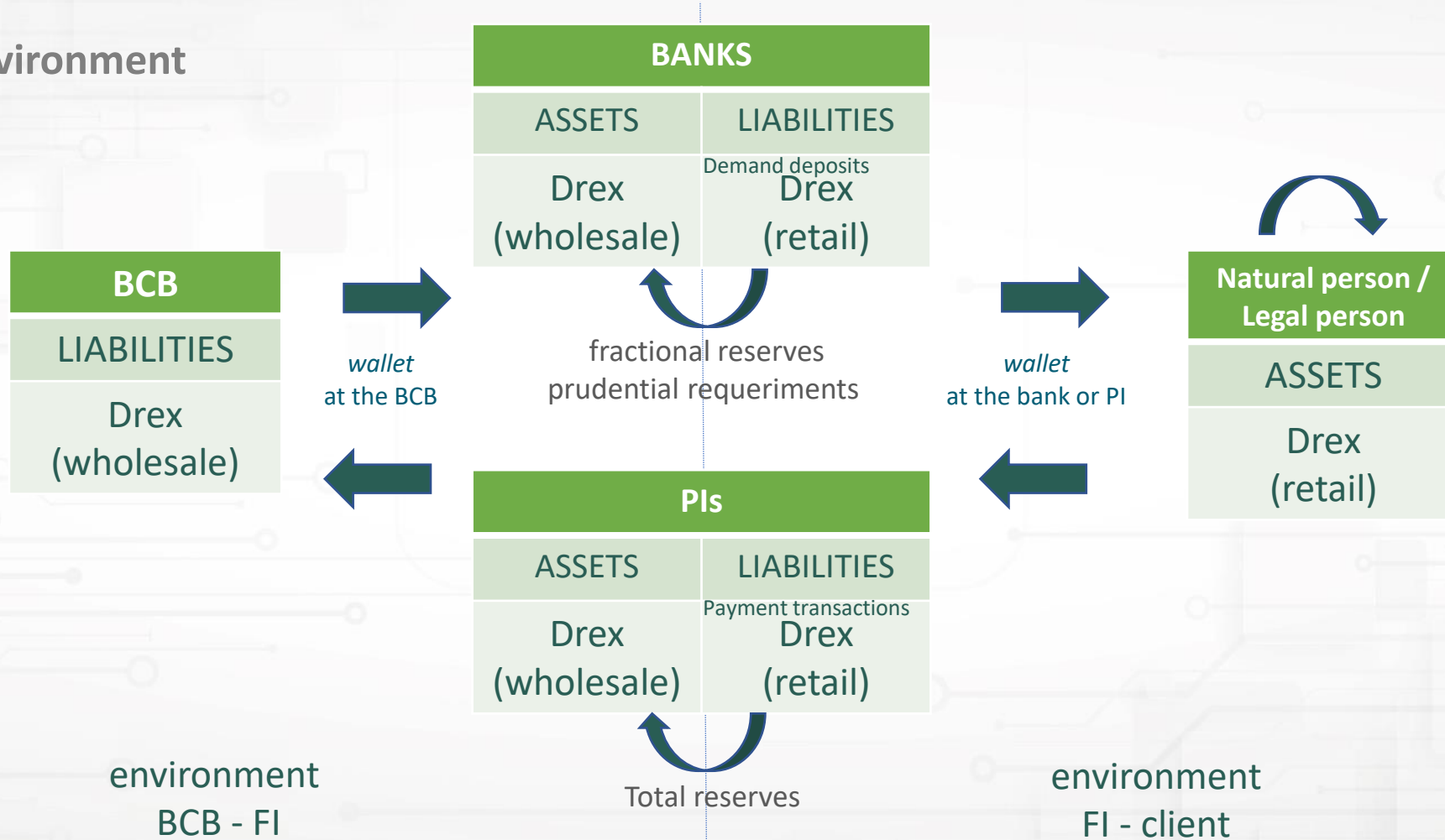
- Lower costs for registration and information reconciliation

**DREX initiative**  
+  
**VASP regulation**





on chain environment



### Objectives

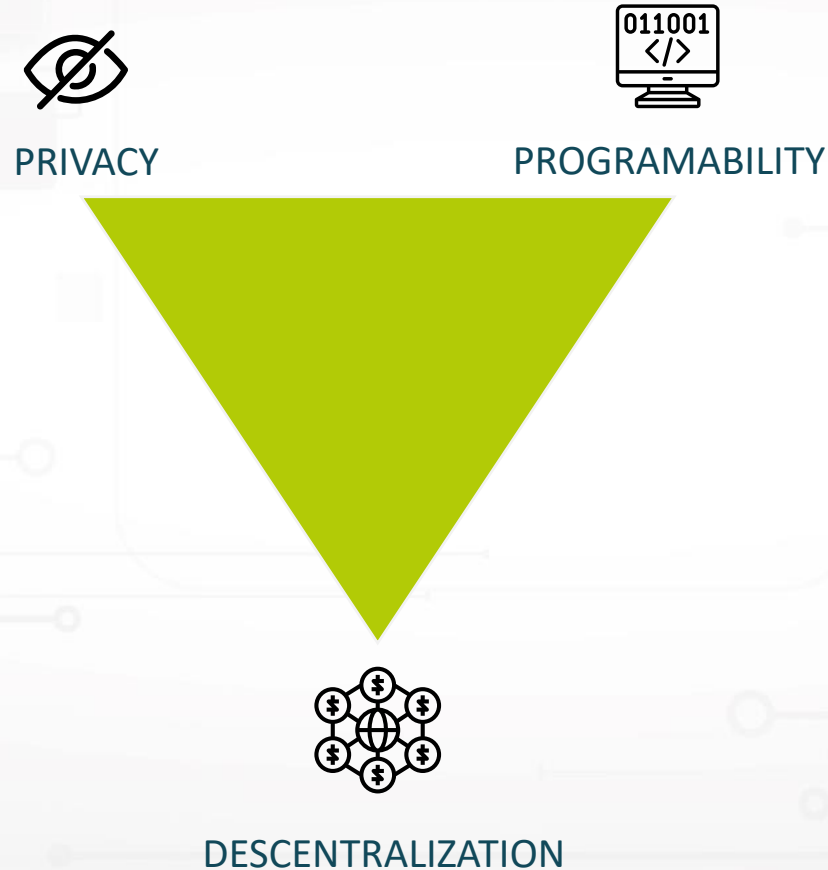
- Development of the Drex platform
- Dialog with society on Drex development

### Guidelines:

1. Multi-asset DLT - Hyperledger Besu
2. Simulated transactions
3. Asset fragmentation
4. Access to services through financial and payment institutions



### Trilemma



- ✓ Decentralization in the provision of products and services
- ✓ Programmability and composition of financial services
- ✓ Privacy compliant to the Brazilian law





# Pilot Project: phase 1

## Connecting trading infrastructures

### Market engagement

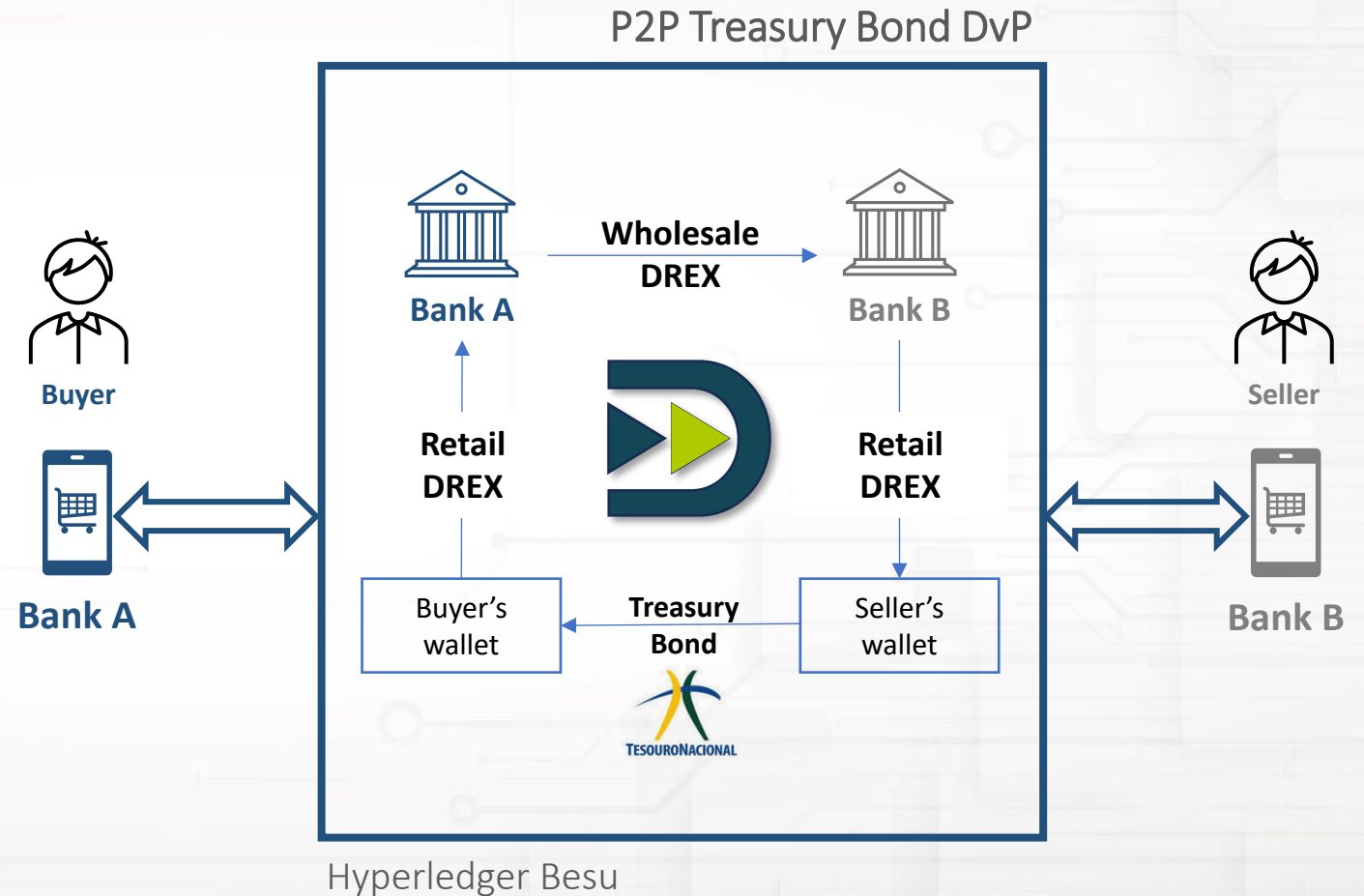
- 16 groups, 70 companies
  - Banks, PSP, Credit unions, fintechs, crypto natives
- Cooperative environment

### Focus of current tests

- Privacy
  - Zether, Starlighth, Rayls, ZKP Nova
- Cyber security
- Infrastructure

### P2P Treasury Bond DvP

- Most sophisticated transaction in test
- Allows for privacy tests
- As simple as an instant payment



# Pilot Project: phase 2

## Governance and privacy use cases

### Broadening the test scope

- Governance
  - 3<sup>rd</sup> party smart contracts
  - business models
- Privacy
  - variability of requirements

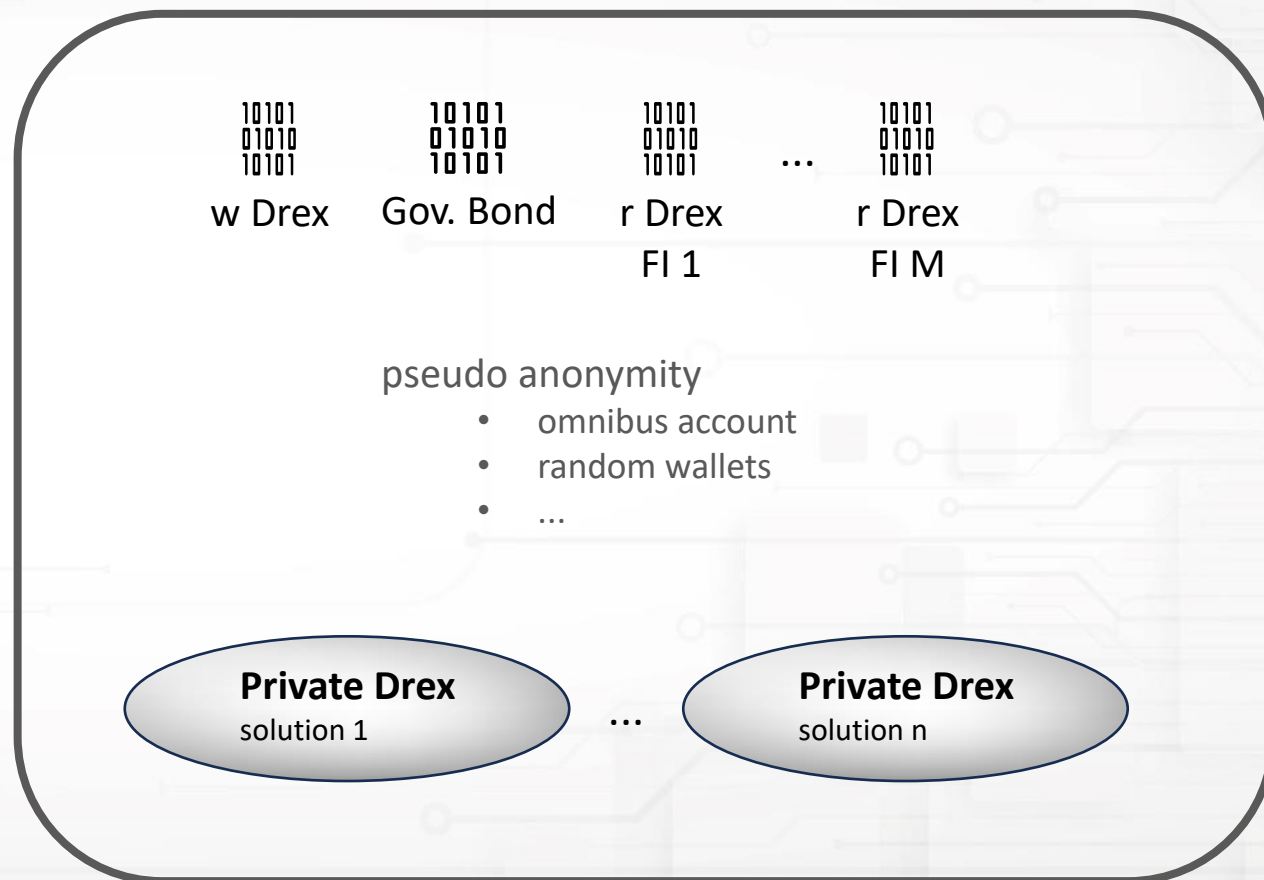
### New assets

- Tightening partnership with other regulators

### Steps

- 2024 – current participants
- H1/2025 – new participants

### Open Drex: permissioned environment



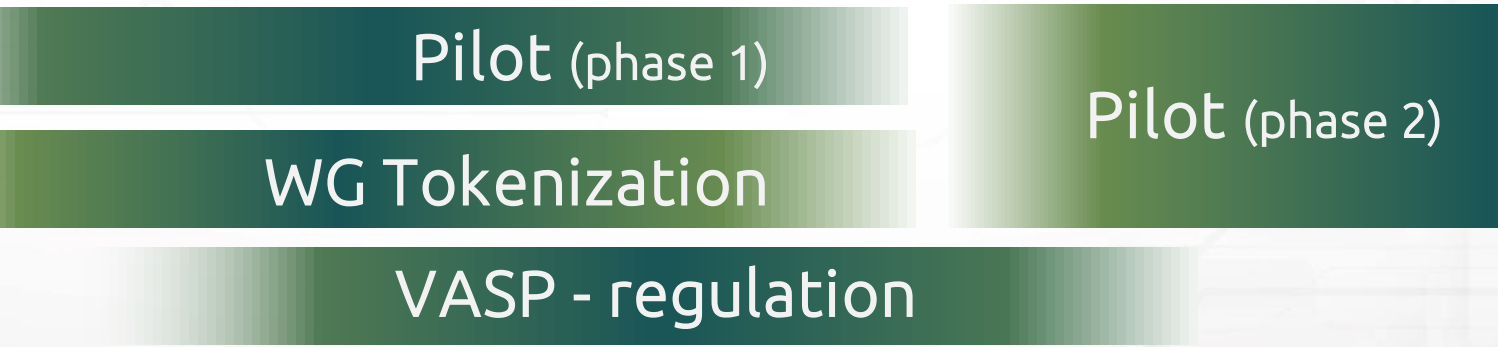
## Pilot Project: phase 2

### The 13 selected use cases and their themes

- Credit card receivables financing
- Credit collateralization
  - on term deposits
  - on government bonds
- International Trade Finance
- FX Market Optimization
- Liquidity Pool for government bonds
- Transactions with RWA
  - Bank Credit Notes
  - Debentures
  - Agribusiness Assets
  - Decarbonization Credits - CBIO
  - Vehicles
  - Real Estate
- Transactions with Virtual Assets







# Thank you!

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