Berkeley Haas

Designing for the Future of Finance

Dave Rochlin and Rupa Ruchismita

July 8th, 2024

@Chou Hall

Praveen,
Chief Product Officer,
PayZen

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Designing for the vulnerable at population scale
- **Multi-party** (Non profit, climate modelers, Government, Refinancing Bank, Insurers, Regulator)
- **Multi-year, Iterative design**
- **A UNFCC recognised innovation!**

South Asia's first climate catastrophe insurance: Meso-level flood index insurance

How it started

Topic:
Catastrophe and Climate Change: Is Insurance the New Mantra?
Why Meso Level Flood Insurance Makes Sense for OXFAM Bangladesh

Project Lead: Oxfam

Oxfam is an international confederation of 17 organizations networked together in more than 90 countries, as part of a global movement for change, to build a future free from the injustice of poverty.

http://www.oxfam.org/

Reinsurance Partner: Swiss Re

The Swiss Re Group is a leading wholesale provider of reinsurance, insurance and other insurance-based forms of risk transfer. Dealing direct and working through brokers, its global client base consists of insurance companies, mid-to-large-sized corporations and public sector clients. Swiss Re firmly believes that risk protection can shift the prospects of low income and risk exposed societies around the world. A pioneer of several successful micro insurance pilots launched in partnership with different public and private sector partners, Swiss Re has developed innovative index insurance in agriculture and disaster management to respond to the needs of the vulnerable populations in many emerging markets.

http://www.swissre.com

Funding Agency: Swiss Agency for Development and Cooperation (SDC)

The Swiss Agency for Development and Cooperation (SDC) is Switzerland's international cooperation agency within the Federal Department of Foreign Affairs (FDFA). In operating with other federal offices concerned, SDC is responsible for the overall coordination of development activities and cooperation with Eastern Europe, as well as for the humanitarian aid delivered by the Swiss Confederation.

http://www.sdc.admin.ch/en/Home

Design Partner: CIRM Advisory Services Pvt. Ltd.

CIRM is a specialized design and research centre, stimulating greater market outreach of risk management solutions among vulnerable households.

http://www.cirm.in

Insuring partner: Pragati Insurance Limited (PI)

Pragati Insurance is one of the leading nonlife insurance companies in Bangladesh, started in 1998.

http://www.pragatiinsurance.com/

Country: Bangladesh
District: Sirajganj

Project areas:
Aknadighi - Boro Chouhali - Chakbayra - Choto Chouhali - Fulbari - Fulhara East - Fulhara West - Khasborosimul - Mollikpara - Hatpara - Muradpur East - Muradpur West - Dhitpur - Panchosona

Technical Partner: Institute of Water Modeling (IWM)

Institute of Water Modeling (IWM) provides world-class services in the field of Water Modeling, Computational Hydraulics & Allied Sciences for improved integrated Water Resources Management. The applications of IWM modeling tools cover a wide range of water related areas such as: flood control, flood forecasting, irrigation and drainage, river morphology, salinity and sediment transport, coastal hydraulics, port, coast and estuary management, environmental impact assessment, bridge hydraulics and related infrastructure.
http://www.iwmbd.org/

Implementing partner at local level: Manab Mukti Sangstha (MMS)

Manab Mukti Sangstha (MMS) is a local level NGO established on January 15, 1984 at Rahaimandalbhog in Sthal Char under Chowhali Upazila in Sirajgonj District with a view to "see a society free from poverty, discrimination and risk of natural disasters'. The organization obtained registration from the Department of Social Services in 1985 and the NGO Affairs Bureau in 1990.
http://www.mmsbangladesh.org/

Project Advisor: Palli Karma Sahayak Foundation (PKSF)

Palli Karma-Sahayak Foundation (PKSF) was established in 1990 by the Government of Bangladesh as a 'not-for-profit' company, registered under the Companies Act 1913/1994. The principal objective of PKSF is to provide funds to various organizations for their microcredit programme with a view to help the poor for creating their employment.
http://www.pksf-bd.org/

Meso-Level Index Based Flood Insurance

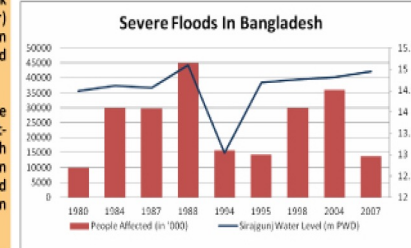**Transferring catastrophe flood risk through insurance**

Risk transfer solutions can narrow, stretched disaster management resource gap & better target post disaster relief.

The transfer of risk retention to a formal risk carrier (the insurer) facilitates efficiencies in disaster management and risk preparedness.

Availability of predictable amounts and timely post-disaster liquidity, through insurance payout, can better facilitate household relief and reconstruction requirements.

Ganges, Brahmaputra and Meghna -annually drain a vast basin12 times Bangladesh's area into the country making it one of the most flood prone geographies in the world.

This project is a unique attempt, where a meso-level flood index insurance has been designed to protect the low income, vulnerable char communities by

improving their ability to cope with flood risks, which would contribute to their socio-economic development.

The product uses model generated flood data for payout calculation, instead of setting up new settlement water level gauges, which makes the product scalable and free from human error and tampering.

Severe Floods In Bangladesh

People Affected (in '000) — Sirajgunj Water Level (m PWD)

Rupalee Ruchismita, Fintech for Equity in Growth Mkts

How it's going

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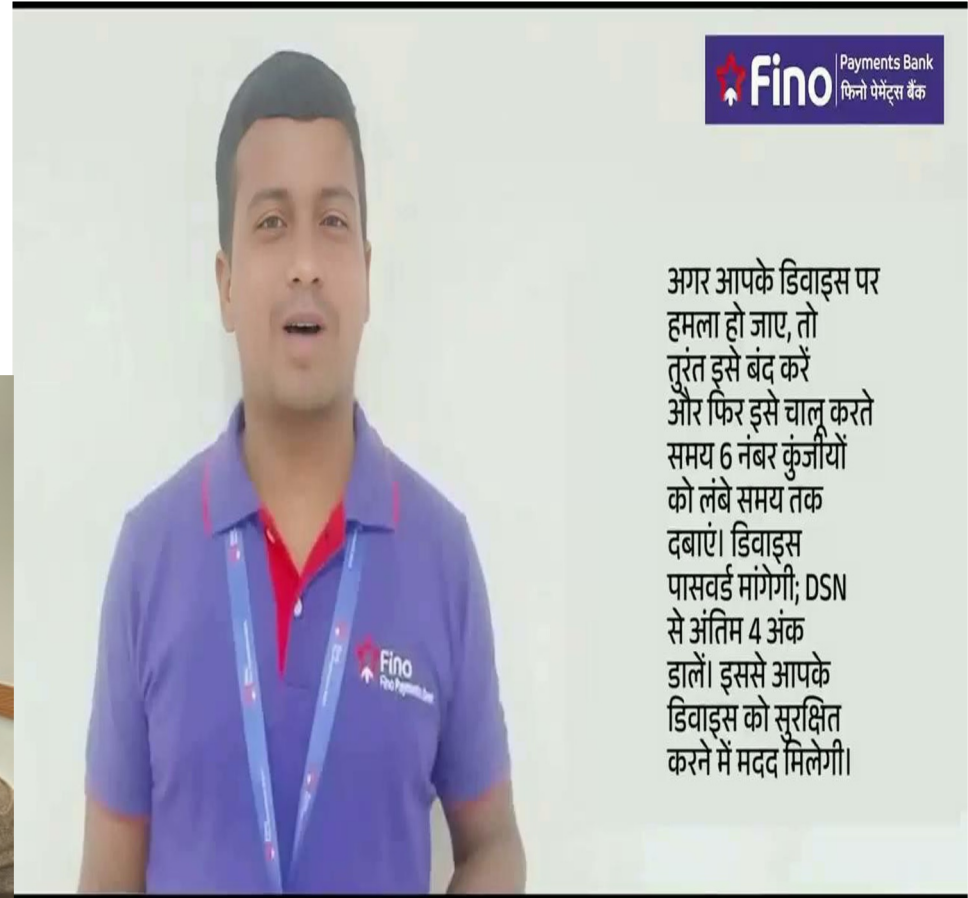## Designing for Fintech intermediaries
- AI for curation and content creation
- Low cost, interactive, personalized solution
- Berkeley World Business Analytics 'AI for Equity' Award

Empowering Fintech merchants through high match value Productivity content

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How it started

SBI- CGM, UC Berkeley Partnership

Feb, 2023

Faculty Speaker

Designing for the Future of Finance

July 8th-12th, 2024

Christine Parlour is the Sylvan C. Coleman Chair of Finance and Accounting at Berkeley Haas. Most of her work is in institutionally complex areas, such as market microstructure and banking. Her current work focuses on changes in the payments system and the effects on bank balance sheets. Her current research areas are FinTech, Payments Systems and Market Microstructure. She is the Co-Director of the Center for Responsible Decentralized Intelligence.

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Christine Parlour

Berkeley
Institute for
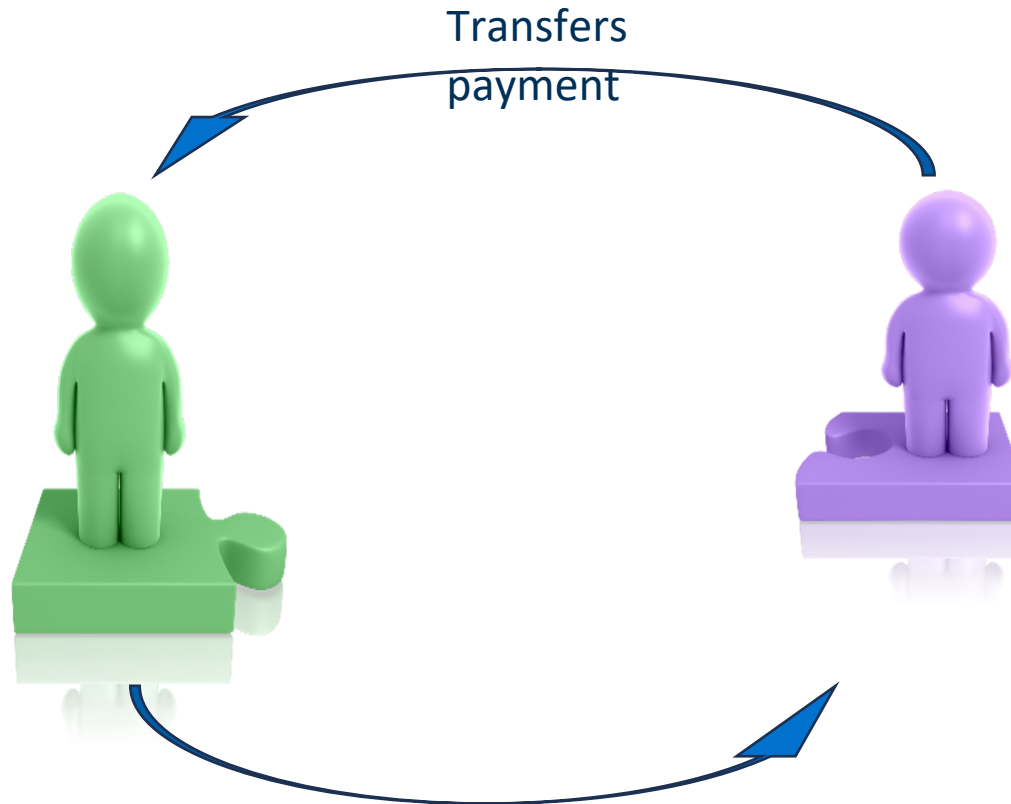Business Innovation

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Tokenization

Christine A. Parlour

Frictions in Financial Transactions - I

Transfers payment

- Payment moves separately from instrument
- Settlement takes xx working days
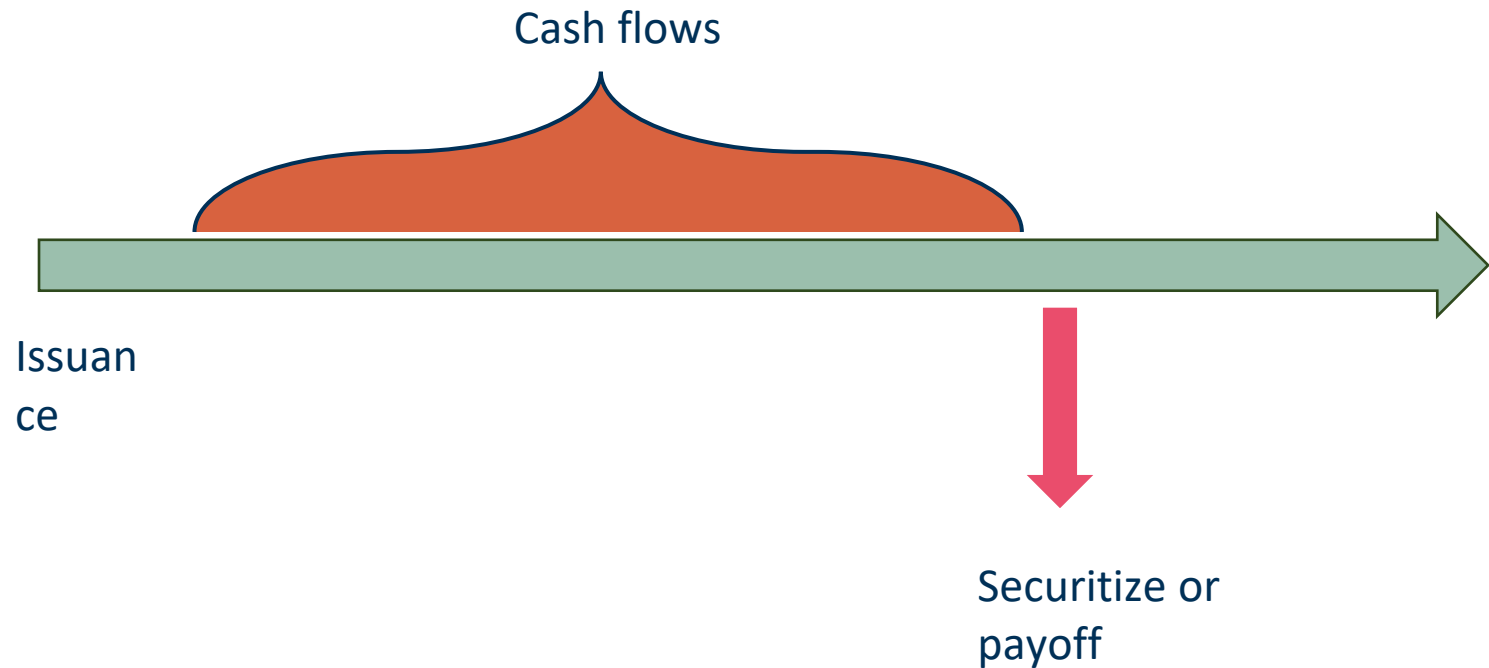- Record keeping separate from messaging

Transfers instrument

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Explicit Costs: Custody

GLOBAL SECURITIES CUSTODY FEE SCHEDULE
Listed below is The Bank of New York Mellon's Global Securities fee schedule

COUNTRY	ADMINISTRATION/ SAFEKEEPING FEE (IN BASIS POINTS) [1]
Argentina (Equities)	18.0
Argentina (Bonds)	15.0
Australia	2.0
Austria (ATS Securities)	4.0
Bahrain	45.0
Bangladesh	45.0
Belgium (Equities)	3.0
Belgium (Bonds)	2.0
Belgium (T/Bills)	2.0
Benin	45.0
Bermuda	20.0
Botswana	45.0
Brazil	10.0
Bulgaria	40.0
Burkina Faso	1.5
Canada	1.5
Channel Islands (Crest eligible Equities/Bonds)	1.0
Channel Islands (Physical)	2.0
Chile	20.0
China	20.0
Colombia	45.0
Costa Rica	18.0
Croatia	30.0
Cyprus	20.0
Czech Republic (Equities/Bonds)	20.0
Czech Republic (T/Bills)	16.0
Denmark	2.5
Ecuador	35.0
Egypt	40.0
Estonia (EEK settled transactions)	10.0
Estonia (EUR settled transactions)	10.0
Euromarkets (Euroclear - Eurobonds only) [2]	1.5
Euromarkets (Clearstream - Eurobonds only)	1.5
Finland	5.0
France	2.0
Germany	2.5
Ghana	45.0

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Frictions in Financial Transactions - II

Cash flows

Issuance

Securitize or payoff

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Explicit Costs: Loan Servicing

DOMESTIC SECURITIES AND LOAN SERVICING FEE SCHEDULE

Safekeeping/Income collection/All Reporting/DTC-ID Affirmations/Transmission of Position

Basis points, per annum, on gross net asset value of the portfolios' aggregate securities, as follows:

Domestic market value of assets under custody:

1.5 basis points	< $500 million
1.0 basis points	$500 million to $1billion
0.5 basis points	> $1 billion

Minimum fees per fund $25,000. The minimum will be applied for the billing period if the fund's domestic and global safekeeping, security/servicing transaction charges, excluding any surcharges or manual intervention fees, fall below the monthly minimum rate. Out of pocket expenses will be charged as is and are not eligible in determining minimums.
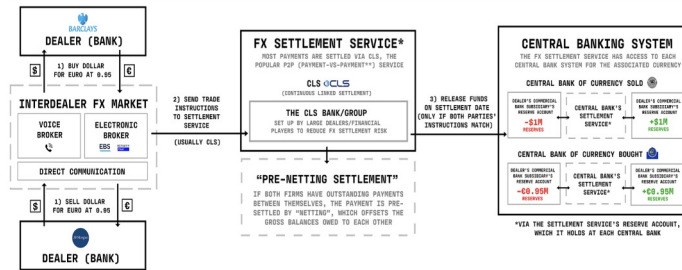
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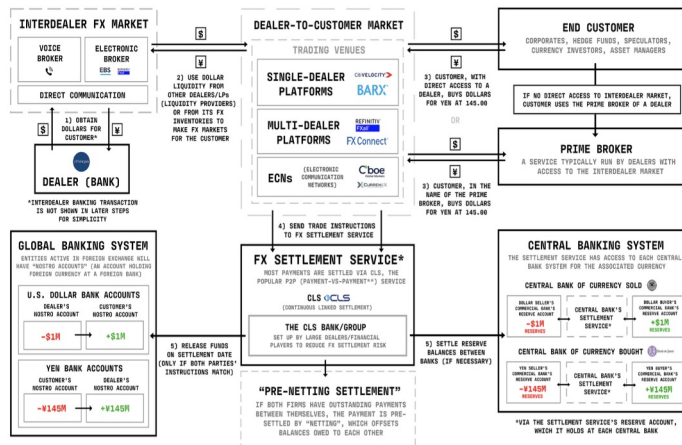
Also….Very complex
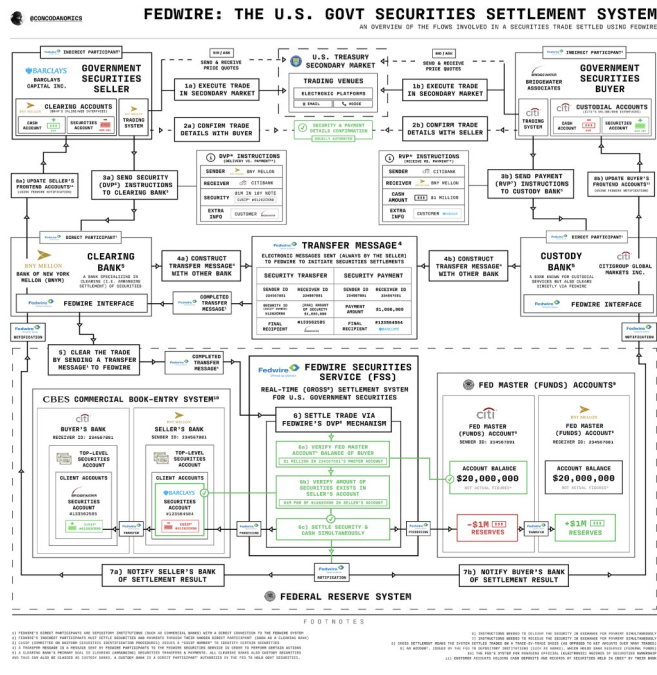
In all markets….

Economic Costs in current system

- Clearing requires coordinated data
- Settlement uncertainty
  - Collateral has to be posted e.g., nostro-vostro or CCPs
    - Opportunity cost of capital

  - Securities have to be moved between sub-custodians
    - Fails

  - Limited Time windows
    - Jump Risk when markets are closed

Models of Tokenization

1. Native tokens
   - Assets issued on-chain
   - Flexibility to design new types of assets (token is code)
   - Legal and regulatory issues

1. Non-native tokens
   - Financial institution holds RWA in custody
   - Issues tokens against them
   - Requires trust in the institution

Native Tokens

- HSBC Orion
  - Regulated under Luxembourg digital asset/blockchain legislation
- Central Account Keeper (CAK) like a CSD
- Issues wallets and initiates transfers
  - Hyperledger but mirrored on Ethereum
- **Settlement token** (specific payments not generalized)

- Floating rate bond with the European Investment Bank (EIB)

Goldman Sachs Digital Asset Platform: GS DAP

- EIB issued 100 million Euro 2 year digital bond on Goldman Sachs GS DAP Jan 2023
- HK monetary authority issued 100 million green bond using GS protocol.
- DvP using a Hashed Time Lock

- Integrated into the Canton network which synchronizes across siloed blockchains

Economic Implications

- Can reduce direct costs of issuing, custody and servicing.

- If the blockchain permits different protocols (trade, lending) increase secondary market liquidity and use value of the asset.

- Interoperability is very important, else blockchain operator has market power.

- **Form** of interoperability is important else credit risk.

- In DeFi Bridges are often hacked.

Real World Assets (RWA) on chain

- Tokenization to increase secondary market liquidity

- Tokenization to allow fractionalization.

- Tokenization makes it easier to switch and use collateral

- Align Technological transfer with title transfer (no fails)

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Soc Gen "Forge" *Coinvertible*

- A Euro demonimated digital asset under French Law

- Economically like a MMF

- Issued on the Ethereum blockchain – only availabl[e] addresses.
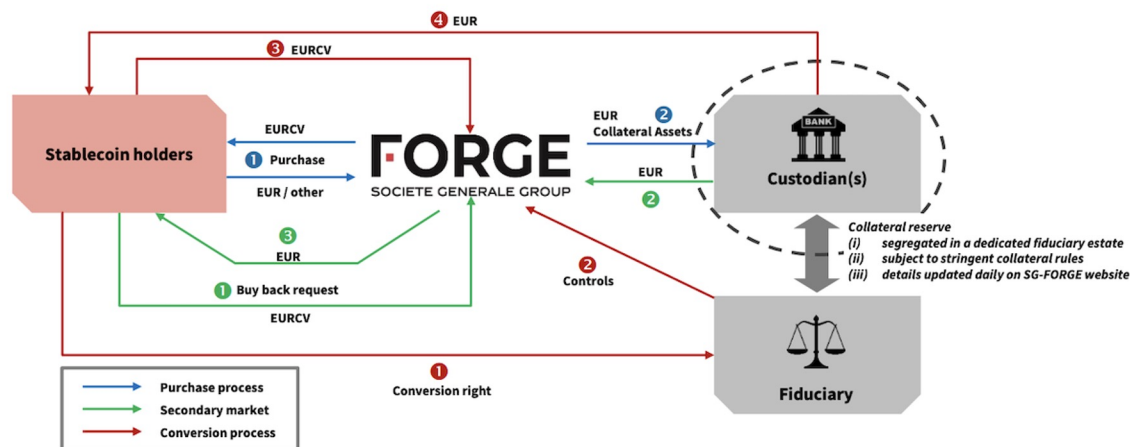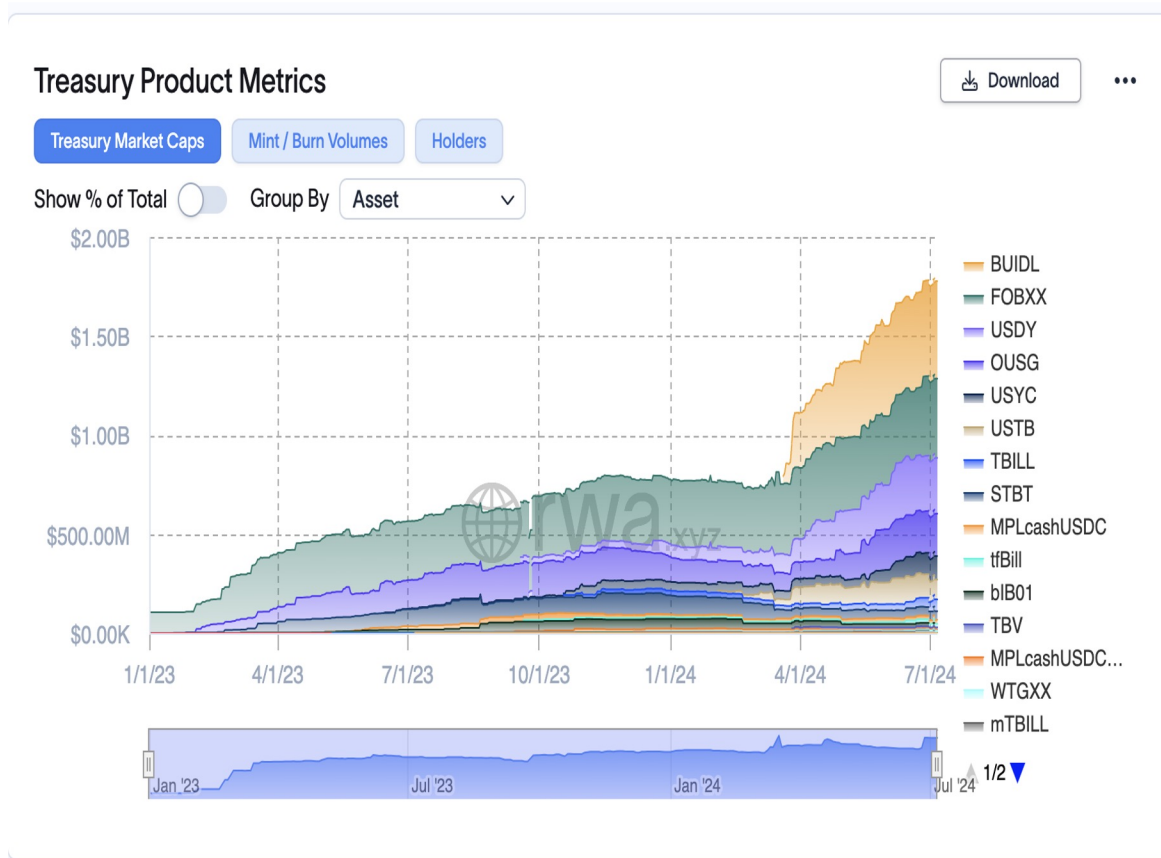

Table 2: EUR CoinVertible (EURCV) structure

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Tokenized Treasury funds

Issuers
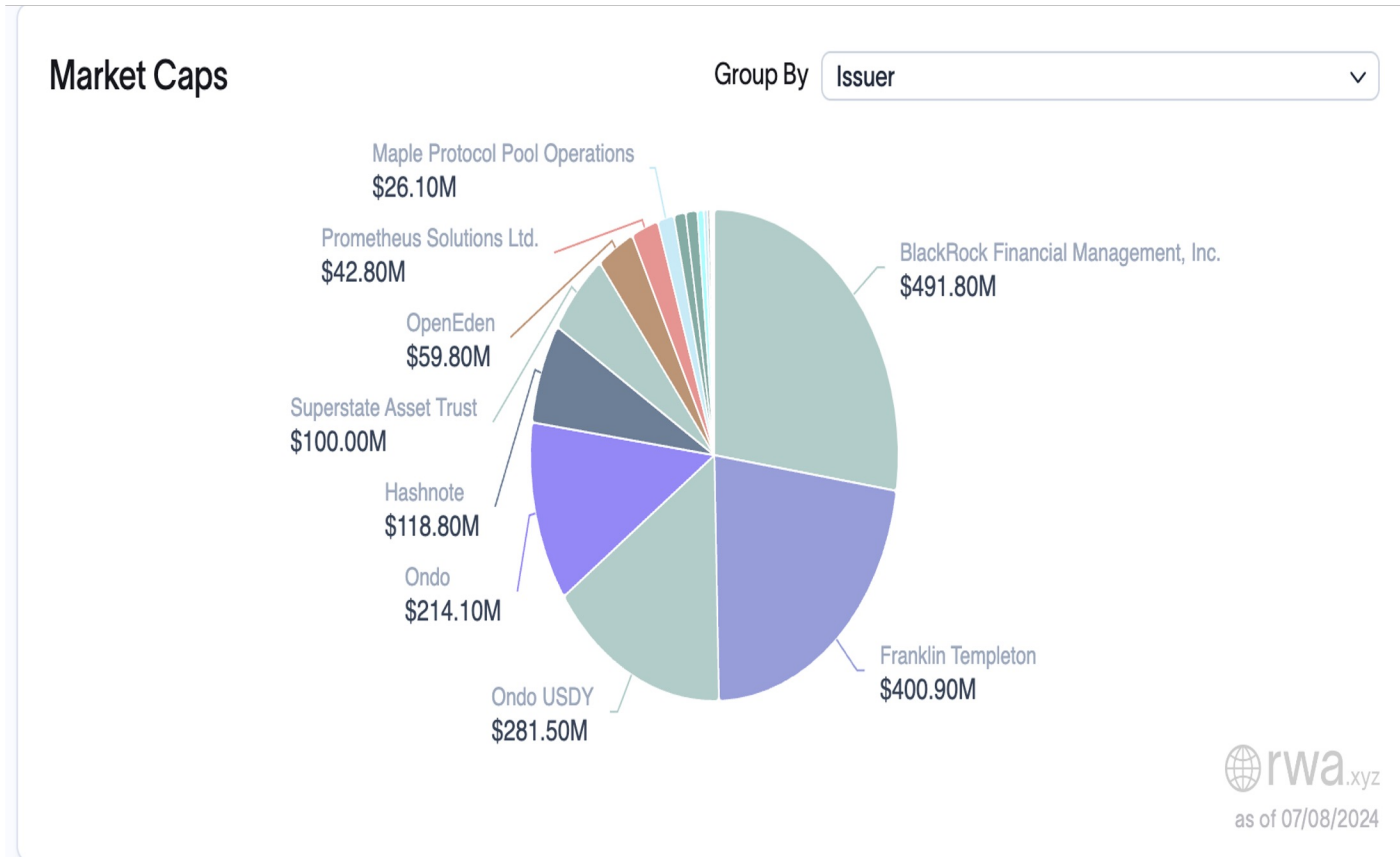
Differences between funds

- Choice of Reserve Assets (collateral)

- Redemptions protocols

- How to ensure AML/KYC

- Choice of Blockchains

Regulated Liabilities (different collateral)

- Regulated financial industries are designing other products that can be used for payments.

- Citi has proposed a "Regulated Liability Network''
  - National currencies or "regulated liabilities"
  - Interoperable
  - Prevents dollarization

Citi Token

- Citi Token:
  - Deposits are tokenized and can be used for cross-border payments 24/7
  - "Regulated Liabilities"
  - Prevents dollarization
  - Cash Management and Trade finance.

- HQLA (by Goldman Sachs):
  - DLT R3 Corda
  - Collateral management for Institutional Clients
  - Delivery versus Delivery (no cash)

Broadridge Distributed Ledger Repo
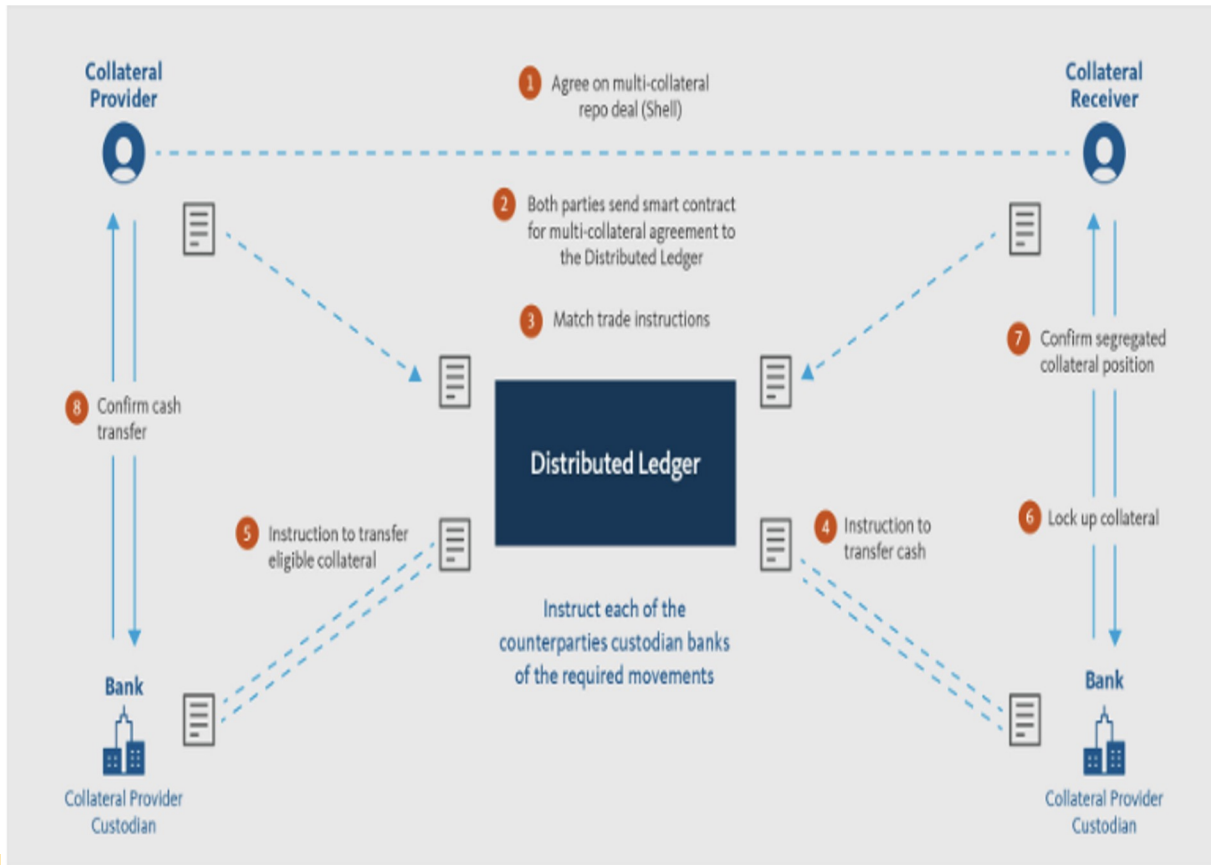
- Existing connections to securities depositories and custodians
- Tokenize collateral
- Payment through conventional rails but occurs at the same time as settlement ``atomic''

DLT Repo

- Smart contracts provide flexibility on terms etc.

- Direct cost savings on reconciliation

- Reduce risk (fails, credit etc.)

- Increased collateral mobility

- Easy for Broadridge to convert custody relationships to tokenize collateral and deploy smart contracts on a DL

Finance/Economic Repo Implications

- Successful: 50 bn daily or 1 trillion a month

- Intraday Repo are easy to implement
- Many are intra-company repos

- Does this have an aggregate effect on collateral usage/demand?
- Does this make banks more/less resilient?

Hamilton Lane tokenizes investment products

- On Polygon

- Partnership with Securitize (which will manage these)

- Issue tokens against illiquid alternate assets such as RE, art etc.
  - Reduce costs and make it easier to offer smaller smaller investment sizes.

- Tap deeper capital markets

Project Guardian (Monetary Authority Singapore)

- Wide ranging project to experiment with tokenization

- Determine best practices on
  - Interoperability
  - Standardization

- Legal framework

Finance/Economic Implications RWA

- For Investor:
  - Buy alternate asset classes with a smaller minimum investment
  - Assets more liquid and easier to use as collateral.

- For firms/issuers
  - Decrease cost of capital (reduction in direct costs)
  - Increase investor base
    - Reduces monitoring incentives potentially increase cost of capital

Questions around Systemic Risk

- Are slow financial systems better?
- Are automated systems less secure?

- How should regulators interact with enterprise blockchain?
- Are tokenized assets more fragile?
- What changes should be made in securities law/regulation?

New Economic Questions

- What exactly are the economic tradeoffs in these new systems?

- Are they economically efficient?

- Will they lead to more or less market concentration?

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Day 1: Where are we
Where we are going

Abstract

Extract Insights | Generate Ideas

Analysis ← → Synthesis

Understand & Observe | Prototype & Experiment

Concrete

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Insights:
Key findings related to your challenge

Problem Frame:
Shaping insights as a "how might we" design challenge

Ideas:
Developing a range of possible solutions

Design research:
Explore and understand Users' attitudes, needs, and behaviors

Concept development
alignment on solutions

De-risk and iterate:
Key variables to explore
Low fidelity testing

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Industry Speaker

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Praveen Chandran is **Chief Product Officer at PayZen.** Though he started his career as a software engineer, he pivoted early on into product management. Prior to PayZen, he worked at Affirm, where he expanded their product team for three large product areas, scaling those teams to what they are today. He also worked in exciting product areas at the likes of Google, PayPal, and SurveyMonkey.

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Business Innovation

affirm

Praveen Chandran

Design Philosophy
- Customer-driven
- Intuitive
- Privacy-centric

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Praveen

- **Focused on core checkout and onboarding at PayPal, and repayments at Affirm**

- **Transformed PayPal's onboarding experience in 192 countries.**

- **Reduced repayment losses by 12%+ at Affirm**

- **Hobbies: Watching cartoon with my daughter!!!**

My Design Philosophy

- **Customer-centric ("what the customer wants")**

- **Intuitive ("don't make the customer learn or guess")**

- **Privacy-centric ("build trust with the customer")**

Firm culture

- PayPal is a checkout solutions provider in a two-sided market. PayPal followed **customer driven design thinking** powered by **quantitative data**.

- Affirm is a BNPL provider in a two-sided market. Affirm's product requirements starts with the **business case** and the design decisions are based on **customer empathy**.

- SurveyMonkey is an **enterprise survey software provider**. The design decisions were largely focused on **customer personas and the needs of each persona**.

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How tools/ focus on specific stages differ based on firm priorities

- **PayPal:** Design team is embedded within the product team. Two types of launches
  - Major product launches adopted rigorous user research
  - Experimentation driven launch for features
- **Affirm:** Operated in two models at different times - embedded design team and centralized design team
  - Repayments was heavily dependent on experimentation driven features
  - User research conducted on critical questions and for new product ideas
- **Google:** Centralized design team
  - Customer Advisory Board (CAB)
- **SurveyMonkey:** Centralized design team
  - User research for major enterprise launches

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Deep Dive with Disruptors
Designing for the Future of Finance

Praveen Chandran: QnA with Rupa Ruchismita

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My Product Leadership tools

- My secret sauce to making the design cycle land successfully is to inculcate a clear process for design thinking focused on customer needs and de-risking launches
  - Have we clearly validated the customer requirements?
  - Have we validated the market size for the requirements?
- Tools/stages are critical for me given the context I operate in
  - Internal:
    - Opportunity sizing, solution sizing
    - Product Requirements Document (PRD), Design reviews, Engineering handoffs
  - External:
    - Market validation through user research and/or experimentation

Process Recommendations for SBI

- Document customer needs

- Validate using user research

- Customer advisory board / focus groups

Domain Recommendations for SBI

- Privacy centricity is important

- Intuitive flows are critical to building a strong customer base

- API centricity helps with faster adoption

Day One Wrap