

PROJECT DYNAMO

CBDACS, STABLECOINS, AND DEPOSIT TOKENS:
WHOLESALE ADOPTION EXPLORATIONS AND CHALLENGES

8 June 2023

FOREWORD

The global financial industry is experiencing a Cambrian explosion of digital money and payments-related innovation, led by both the public and private sectors, taking the form of central bank digital currencies (“CBDCs”), deposit tokens (“DTs”), and stablecoins (“SCs”), amongst others.

Given the use of infrastructure in traditional finance that separates messaging and settlement, thereby resulting in delayed settlement and cost, it is no surprise that experimenting with blockchain and distributed ledger technology (“DLT”) to achieve Payment versus Payment (“PvP”), Delivery versus Payment (“DvP”), and programmability is a key driver of innovation in the global payments landscape, and precisely where this type of innovation shows the highest promise.

Nevertheless, given the experiment in this space is still very new, benefits are being carefully weighed against key risks and challenges. Common challenges include identifying unmet current and future commercial needs, the most suitable technology stacks, the optimal legal classification and terms and conditions, the challenges in meeting regulatory compliance, and the challenges associated with building and governing new consortia and networks that don't compromise the safety and efficiency of financial market infrastructures.

It goes without saying that these uncertainties need to be addressed for this innovation to take root in a more sustainable manner. Against this backdrop, and in the context of project Dynamo which involves the use of digital trade tokens, the BIS Innovation Hub Hong Kong Centre partnered with Quinlan & Associates to develop an in-depth landscape study of the current state of play of CBDCs, DTs, and SCs, underpinned by interviews with 29 leading global market participants and stakeholders active in one or more of these explorations.

We hope that policy-makers and industry players can leverage the content of this study to foster closer cooperation among the public and private sector, while also enabling the Cambrian explosion to reach a desired end destination – namely, well-rooted innovation that is spurred by unmet commercial needs and characterised by robust regulatory compliance.



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Head of Hong Kong Centre
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IMPORTANT NOTES

- The data set forth in this report is derived from the findings of both primary interviews and facts gathered via secondary research efforts.
- The views in this report are predominantly based on interviews conducted with high-profile market stakeholders and facilitators who are actively involved in experimentation with CBDCs, DTs, and SCs.
- Certain statements made within this report reflect an aggregated view, based on our interview findings, and should not be interpreted as the opinion or endorsement of the Bank for International Settlements ("BIS") or BIS Innovation Hub ("BISIH").
- As both the technology (i.e. blockchain / DLT) and the assets (i.e. CBDCs, DTs, and SCs) are currently in their early stages of development, the report's objective is to provide context for various market adoption exploration efforts across the wider industry. The report does not assume there will or shall be widespread adoption of either the technology or the assets across financial markets.
- This report only showcases the adoption of both the technology and the assets within the context of wholesale financial market operations. As such, applications of the technology and the assets for retail use cases (e.g. peer-to-peer transfers, for the purposes of / access to investment in the digital assets market by retail investors) is not within the scope of this report.
- This study is explicitly focused on the adoption exploration of "blockchain representations of sovereign currency" that are either fully or partially collateralised / backed by sovereign currency or its equivalent. Alternative forms of 'blockchain representation of sovereign currency', such as those backed by other digital assets (e.g. BTC, ETH, XRP, etc.) or software-based algorithms (e.g. Terra / Luna), are not considered within the scope of this report.
- As regulations, standards, and frameworks continue to rapidly evolve, the definitions and insights presented in this report represent our findings at the time of its drafting. Hence, certain findings may become outdated or subject to change.
- Despite the possibility that certain stablecoin issuers may not be fully compliant with local, regional, or global standards / regulations at the time of writing, this report presumes that all stablecoin issuers are subject to relevant regulations in their operating jurisdictions and are recognised entities holding an e-wallet license (e.g., Stored Value Facility License in Hong Kong) or its equivalent.

ACRONYMS

List of Abbreviations

(By alphabetical order)

- AML: Anti-money Laundering
- ADGM: Abu Dhabi Global Market
- CASP: Coordinated Activities on the Safety of Products
- CBDC: Central Bank Digital Currency
- CTF: Counter-Terrorist Financing
- DIFC: Dubai International Financial Centre
- DLT: Distributed Ledger Technology
- DT^{*}: Deposit Token
- DTT: Digital Trade Token
- DvP: Delivery-versus-Payment
- EPI: Electronic Payment Instrument
- FI: Financial Institution
- FTSP: Fund Transfer Service Provider
- HKMA: Hong Kong Monetary Authority
- MAS: Monetary Authority of Singapore
- MiCA: Markets in Crypto-Assets
- MPI: Major Payment Institution
- MTL: Money Transmission License
- NBFI: Non-banking Financial Institution
- PSA: Payment Services Act
- PvP: Payment-versus-Payment
- SC: Stablecoin
- SCA: Securities and Commodities Authority
- SPI: Standard Payment Institution
- SVF: Stored Value Facility
- VARA: Virtual Assets Regulatory Authority
- VASP: Virtual Asset Service Provider

¹Deposit tokens are also referred as tokenised deposits or regulated liabilities

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EXECUTIVE SUMMARY (1/5)

PROJECT OVERVIEW

- The focus of this landscape study is on wholesale adoption explorations of CBDCs, DTs, and SCs, including adoption challenges and the broader market development outlook for key market participants.
- The following topics were covered: (1) definition and prospective use cases, (2) industry adoption outlook, (3) adoption challenges, (4) organisational positioning, (5) the use of blockchain, and (6) regulatory development outlook.
- Our methodology included both primary and secondary research to ensure a comprehensive understanding of various wholesale use cases for CBDCs, DTs, and SCs.
- For our primary research efforts, we interviewed 47 leading executives with relevant expertise across 29 organisations covering potential issuers of stablecoins and / or deposit tokens [7], infrastructure providers [9], payment companies [3], intergovernmental organisations [3], law firms [3], professional services firms [2], and academic institutions [2].
- The objective of this landscape study is to provide practical and applicable reference frameworks, an overview of key trends, and detailed primary market intelligence to help steer continued healthy development of the financial markets.

DEFINITIONS¹

- To converge on definitions of CBDCs, DTs, and SCs we explored their underlying characteristics, including technology, price stabilisation mechanism, and issuing entity.
- For the purposes of this landscape study, we decided to focus our definitions specifically on DLT-based digital representation of sovereign currency issued by central banks, regulated banks, and non-bank financial institutions.
- We excluded any other DLT-based assets that are neither being collateralised by nor directly referencing sovereign currencies, such as algorithmic stablecoins.

¹Given the ongoing discussion regarding the taxonomy and definitions of CBDCs, DTs, and SCs, the concluded definitions from the research findings are used solely for the purposes of this study and may be used as one of the reference points

EXECUTIVE SUMMARY (2/5)

ADOPTION EXPLORATIONS

- The commonality between CBDCs, DTs, and SCs is that they can be used for straight-through processing and end-to-end instant payments / settlement, including PvP and DvP, combined with programmability.
- The adoption of blockchain / DLT has the potential to materially change the existing method of settlement for payments and regulated assets (e.g. securities), both of which are key pillars of the financial markets.
- At the same time, well-rooted methods tend to be highly sticky and the incentives of self-disruption by existing incumbents and stakeholders in traditional financial markets remains low.
- Despite this, many incumbents and stakeholders have shown willingness to explore blockchain / DLT for PvP and DvP to address existing pain points, such as lengthy settlement times, lack of transparency, and high transaction costs.
- Other forms of programmability of money and payments are also an area of active experimentation, both by disruptors and incumbents.
- There is significant interest in adopting blockchain / DLT for wholesale financial operations across both public and private sectors .
- BIS initiatives such as Project mBridge (multilateral payment platform using CBDC), Jura (cross-border PvP and DvP using CBDC), Helvetia (Domestic DvP using CBDC), Dynamo (programmability of SC in the trade finance context), and Genesis (tokenised bonds with programmed delivery of carbon credits) are examples of such explorations.
- Many financial institutions are actively exploring the adoption of DLT-representations of fiat currency in both PvP and DvP scenarios, with promising developments being observed in the trade finance and fixed income space.
- Non-banking industry players, particularly those involved in international trade, are also actively exploring wholesale use cases of CBDCs, DTs, and SCs to address existing pain points associated with working capital.

EXECUTIVE SUMMARY (3/5)

MARKET DEVELOPMENT

- As with any new technology, institutions tend to execute their technology initiatives in silos, given fundamental differences in corporate strategies and operating procedures.
- Recognising this challenge, various initiatives are underway to connect these "walled gardens" – in short, leading financial market infrastructure players and technology providers are looking to address challenges around limited interoperability, including by offering aggregation platforms, standardised messaging guidelines, and relay chains, among various other initiatives.

EXECUTIVE SUMMARY (4/5)

REGULATORY PERSPECTIVES

- While there is significant interest in the adoption of blockchain / DLT for wholesale financial operations, there are several regulatory challenges that need to be addressed.

Existing Regulations

- For example, one of the first steps in blockchain / DLT adoption is the selection of a blockchain / DLT protocol, in which we identified limited industry converge, stemming from different views on the potential of various blockchain types and, ultimately, how the development of the industry will unfold.
- One of the key regulatory considerations hindering adoption is how compliance with anti-money laundering (“AML”) and counter-terrorist financing (“CTF”) sanctions rules can be effectively achieved, given the universal availability of these digital assets.
- Entities we spoke with generally preferred entity-level AML to be implemented (vs. asset-level AML) in order to limit operational complexities, while better controlling the legal responsibilities / consequences across the ecosystem.

New Regulations

- CBDCs and DTs benefit from existing legal and regulatory frameworks that provide market participants with sufficient regulatory clarity; in contrast, SCs are a relatively new concept, necessitating the development of new regulations or the adaptation of existing ones.
- Given that CBDCs, DTs, and SCs are often discussed in parallel, regulatory clarification across all three is necessary for organisations to further explore wholesale use cases. And we are seeing more regulators around the world actively endorsing real-world use cases, ensuring investor protection, etc.
- Despite these efforts, inconsistencies in legal taxonomies and licensing requirements are hampering adoption efforts, with organisations calling for greater regulatory convergence and cross-jurisdictional harmonisation.
- While achieving regulatory harmonisation may be idealistic, it is important for regulators and policymakers to foster closer cooperation and coordination support greater interoperability with respect to final settlement for cross-jurisdictional wholesale cases involving PvP and DvP.

EXECUTIVE SUMMARY (5/5)

NEXT STEPS

Market Facilitators: Regulators / Policymakers

- Regulatory bodies have been actively publishing consultation papers outlining their approach to digital assets. However, notable discrepancies in terms of legal taxonomies, definitions, and responsibilities persist across jurisdictions, particularly with respect to stablecoins.
- Greater regulatory cooperation and coordination efforts to support cross-jurisdiction interoperability remains extremely important, enabling more responsible and sustainable progress by market participants.

Market Stakeholders: Banking Institutions / Non-Banking Institutions / Financial Market Infrastructures / Payments Companies

- We have observed a growing interest in the adoption of CBDCs, DTs, and SCs by major banking and non-banking institutions across various jurisdictions.
- We recognise that both technology and regulation are in their early stages of development, which may lead to siloed initiatives within individual "walled gardens".
- Despite industry convergence challenges, we encourage institutions to keep a close eye on potential interoperability solutions that could unlock the full potential of this new asset class in the years to come.

SECTION 1

PROJECT OVERVIEW



RESEARCH APPROACH

By conducting interviews with key industry stakeholders from across the globe, from banks to academic institutions, supplemented by detailed secondary research, we were able to capture a wide range of perspectives on the wholesale adoption explorations of CBDCs, DTs, and SCs

Interview Participants

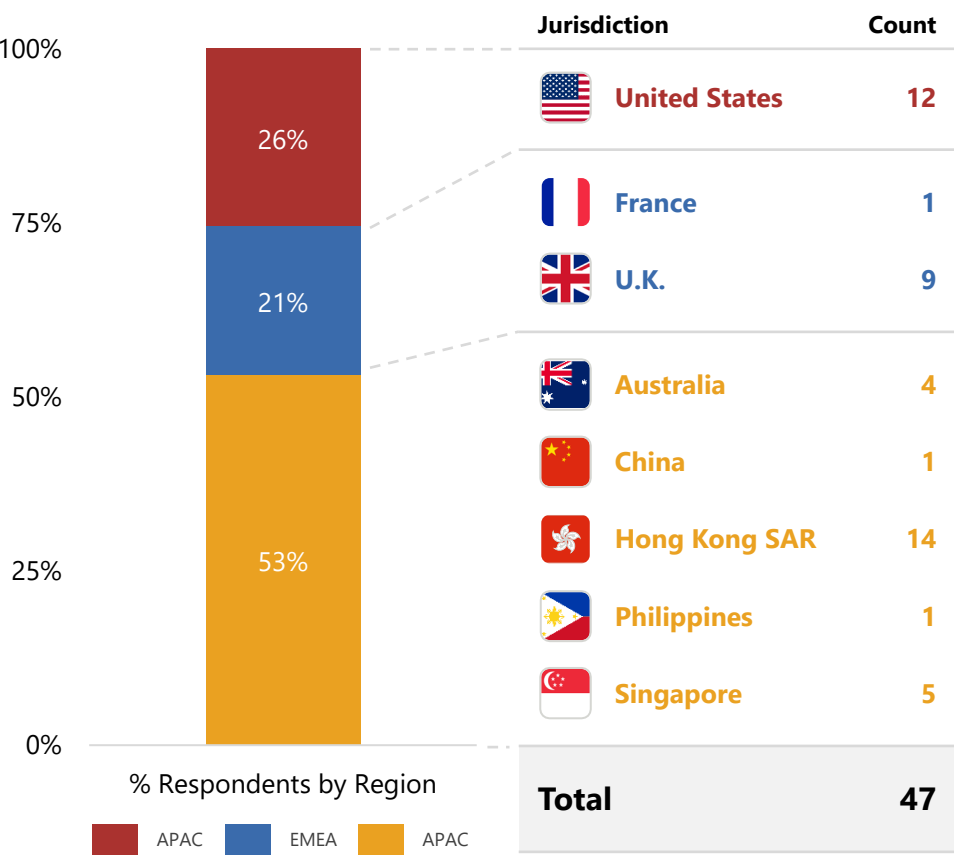
By Organisation, Count = 29*

	Participants	Count	Objectives
MARKET STAKEHOLDERS	 POTENTIAL ISSUERS OF SCs / DTs	7	Gain insights into the current initiatives, priorities of, and challenges facing key market participants around blockchain asset adoption
	 INFRASTRUCTURE PROVIDERS	9	
	 PAYMENT COMPANIES	3	Understand the current role and future plans of payment companies around upcoming changes related to blockchain adoption
MARKET FACILITATORS	 INTERGOVERNMENTAL ORGANISATION	3	Comprehend the perspectives of regulators, policymakers, and central banks towards CBDCs, DTs, and SCs
	 LAW FIRMS	3	Obtain insights into regulatory developments and legal classifications driving the outlook of CBDCs, DTs, and SCs
	 PROFESSIONAL SERVICES	2	Digest the complexities of CBDCs, DTs, and SCs from a professional services perspective (e.g. accounting, bookkeeping, etc.)
	 ACADEMIC INSTITUTIONS	2	Discuss high-level perspectives on CBDCs, DTs, and SCs from a regulatory, business, and other relevant standpoints

*The project team shortlisted and conducted interviews with the most relevant organisations: high-profile market stakeholders and intermediaries that are pioneering the exploration of potential use cases for CBDCs, DTs, and SCs
Source: Interviews, Quinlan & Associates analysis

Interview Participants

By Individuals & Jurisdiction, Count = 47



KEY TOPICS & QUESTIONS

KEY OBSERVATIONS

This report focuses on the following:

- **Wholesale adoption explorations and use cases** of CBDCs, DTs and SCs, excluding retail use cases; and
- **Within the context of financial market operations**, excluding non-financial use cases of CBDCs, DTs and SCs.

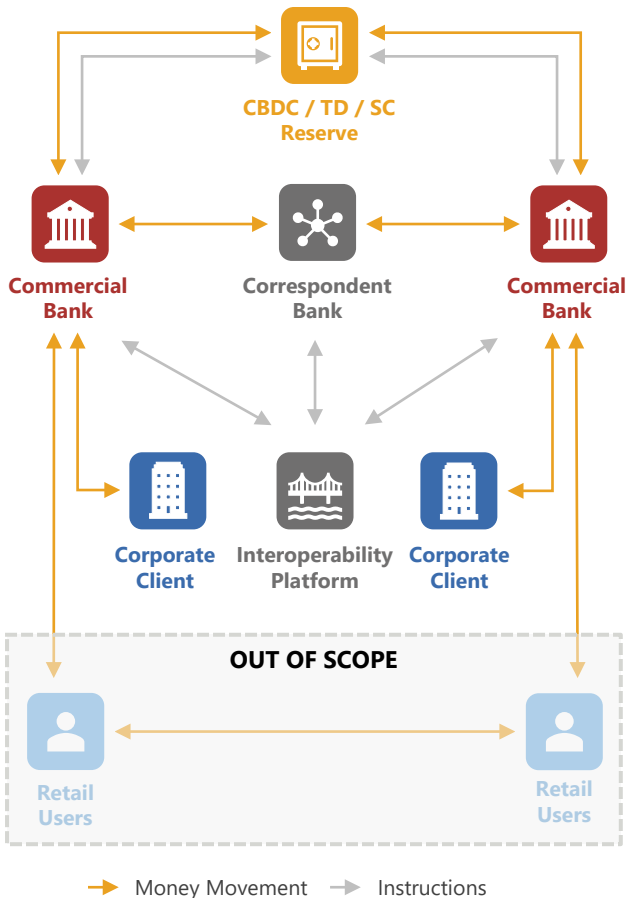
To provide an understanding of the above, the report covers the following topics, which were used as the overall guideline when conducting our interviews:

- Definition of CBDCs, DTs and SCs;
- Prospective use cases;
- Industry adoption outlook;
- Adoption challenges;
- Organisational Positioning;
- The case for blockchain adoption (*vis-à-vis other technologies*); and
- Regulatory development outlook (*between various jurisdictions*).

Our research focused specifically on the wholesale adoption explorations of CBDCs, DTs, and SCs, covering a range of key topics; from the definition of these digital assets to the broader regulatory development outlook

Research Focus

Prospective Wholesale Use Case



Key Topics

Sample Questions

Topic	Sample Question
Definition	We have defined DTs as DLT representations of fiat currency that are issued, managed, and governed by a commercial bank. Do you agree with this definition?
Prospective Use Cases	Could you share any initiatives pertaining to the wholesale uses of CBDCs, DTs, and SCs?
Adoption Outlook	Out of public, private, and consortium blockchains, which do you think will be most popularly deployed for wholesale SC / DT use cases and why?
Adoption Challenges	How would you rank the following business-specific adoption challenges for wholesale use cases of CBDCs, DTs, and SCs by their potential level of difficulty?
Organisational Positioning	How do you envision your organisation to be positioned if the broader adoption of wholesale CBDC / SC use cases takes place?
The Merits of Blockchain	Why do you believe blockchain / DLT technology, despite its technological complexity and lack of compatibility with the existing infrastructure, should be leveraged?
Regulatory Outlook	What are the regulatory clarifications or frameworks that need to be put in place to facilitate responsible adoption of SC / DTs?

Source: Interviews, Quinlan & Associates analysis

SECTION 2

DEFINITION



SCOPE OF DEFINITIONS

KEY OBSERVATIONS

Before arriving at a definition of: (1) CBDCs; (2) SCs; and (3) DTs, the underlying characteristics, spanning: (a) technology; (b) price stabilisation mechanism; and (c) issuing entity, which set them apart, were explored:

- **Technology:** using blockchain / DLT or not.
- **Price Stabilisation Mechanism:** (1) fiat-based; (2) principal-based; or (3) algorithmic; and
- **Issuing Entity:** (1) public institution or (2) private institution.

This report focuses on blockchain / DLT based digital forms of sovereign currency issued by central banks, regulated banks and non-bank financial institutions.

This scope of this study was limited to blockchain / DLT representation of digital forms of sovereign currency issued by central banks, regulated banks, and non-bank financial institutions

Defining Criteria

Technology, Fundamentals, and Issuer



TECHNOLOGY

- 1

DLT BASED
Usage of blockchain technology to power the underlying infrastructure
- 2

NON-DLT BASED
Usage of non-blockchain technology to power the underlying infrastructure

IS DISTRIBUTED LEDGER TECHNOLOGY (I.E. BLOCKCHAIN) BEING LEVERAGED?



PRICE STABILISATION MECHANISM

- 1

SOVEREIGN CURRENCY
Backed by fiat or claims on regulated banking institutions or central banks
- 1.1

FULLY FIAT-BACKED
A 100% reserve ratio, in the form of cash or other satisfactory securities
- 1.2

FRACTIONALLY FIAT-BACKED
A partially backed offering, with a reserve ratio of below 100%
- 2

PRINCIPAL-BASED
Commodity- / cryptocurrency-pegged / reserved offering
- 3

ALGORITHMIC
A cryptocurrency-supported offering, governed by an algorithm

IS REGULATED FIAT CURRENCY BEING UTILISED AS COLLATERAL?



ISSUING ENTITY

- 1

PUBLIC INSTITUTION
Issued and governed by a government / quasi-government authority
- 2

PRIVATE INSTITUTION
Issued and governed by a non-governmental organisations
- 2.1

BANKING INSTITUTIONS
A well-regulated and recognised banking institution
- 2.2

NON-BANKING
Private institution offering financial services without a banking license

WHO IS RESPONSIBLE FOR THE ISSUANCE AND GOVERNANCE?

DEFINITION: BY ISSUING ENTITY

KEY OBSERVATIONS

Stakeholders generally agreed on the definition of CBDCs, DTs, and SCs, and that the liability must lie with the respective issuing entity.

Beyond the original scope of the definition, there are further aspects to consider that were shared by the interviewees, including:

- Level of asset backing (i.e. collateralisation);
- Variations in issuing entities by jurisdiction; and
- Interest / non-interest-bearing nature.

RELEVANT QUOTES

By a Law firm
"CBDC(s) represent a claim against the central bank reserve."

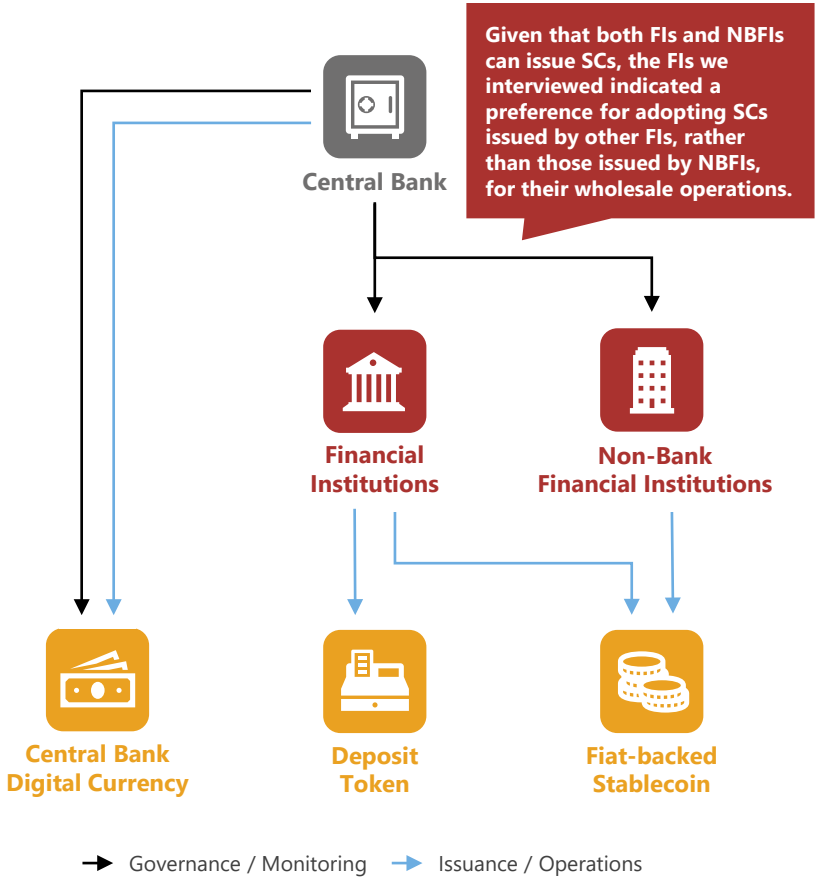
By a Digital Assets Player
"DTs represents a claim on the bank's reserve and SCs represents a claim on the NBFI's reserve."

By a Payment Company
"There are examples of bank-issued SCs, so issuance is not restricted to NBFIs."

There is broad alignment on the definition of CBDCs, DTs, and SCs, in that the liability must lie with the respective issuing entity, albeit with some variations (e.g. the level of backing, jurisdiction-dependent issuing entity, and interest / non-interest-bearing nature)

Blockchain / DLT representation of regulated assets

CBDCs, DTs, and SCs



	CBDCs	DTs	SCs
TYPE	M0	M1	M1
DEFINITION	Issued, managed, and governed directly by a central bank	Issued and managed by regulated banking institutions (e.g. commercial banks)	Currently ¹ Issued and managed by NBFIs ² or explored by regulated banking institutions
SUPPORTING VIEWS	Central Bank Liability <ul style="list-style-type: none"> • CBDCs are regarded as a claim on the central bank 	Commercial Bank Liability <ul style="list-style-type: none"> • DTs represent a claim on a regulated banking institution 	Issuing Entity's Liability <ul style="list-style-type: none"> • SCs represent a claim on an NBFI or regulated banking institution
ADDITIONAL VIEWS	Backed by trust in a Central Bank <ul style="list-style-type: none"> • CBDCs are backed by the trust of the central bank 	Issued under the fractional reserve system	Fully-backed <ul style="list-style-type: none"> • Currently¹ the leading SCs are typically backed 1:1 to a currency or, in the case of USD SCs (currently the majority of outstanding SCs), holdings of U.S. treasuries³

¹Subject to future regulation; ²Non-banking Financial Institutions; ³See for example: [Industry Letter - June 8, 2022: Guidance on the Issuance of U.S. Dollar-Backed Stablecoins | Department of Financial Services \(ny.gov\)](#).

Source: Interviews, Quinlan & Associates analysis

STRUCTURAL DIFFERENCES

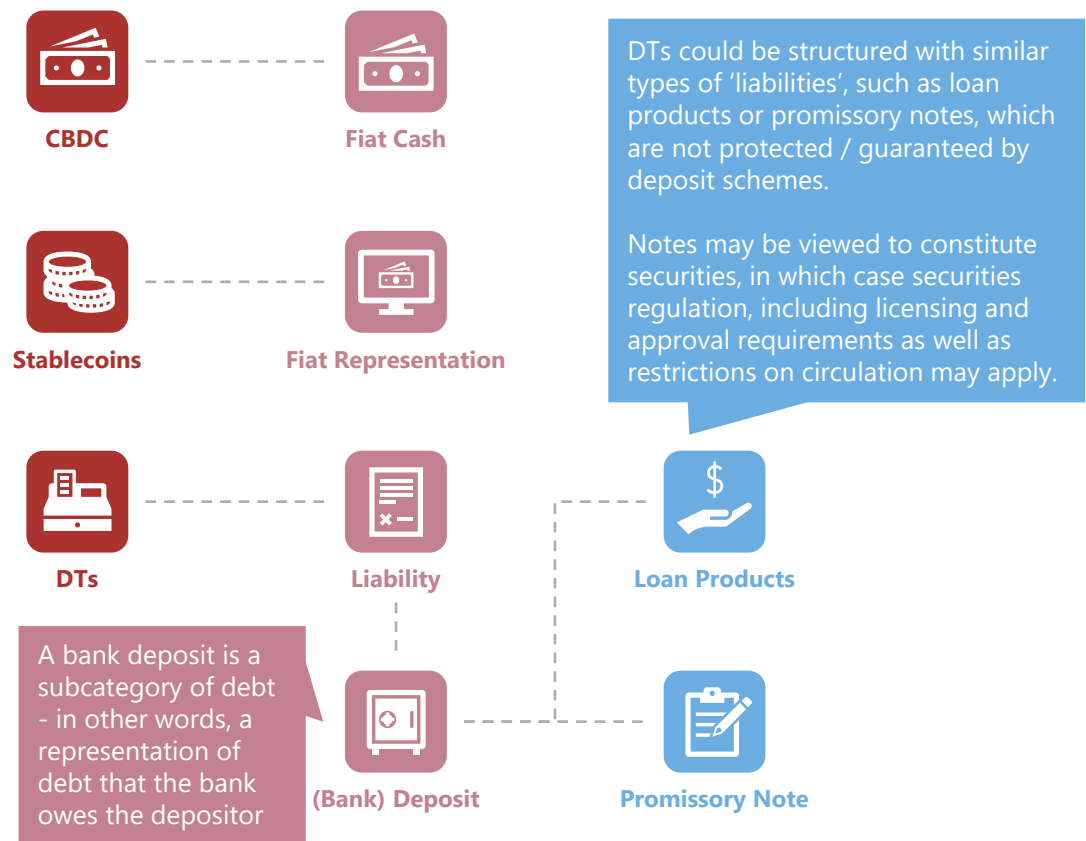
KEY OBSERVATIONS

Considering the fully-backed nature of CBDCs and SCs, they are structured, understood, and function in a manner comparable to traditional fiat currencies.

DTs are commercial bank liabilities (e.g. bank deposits, promissory notes etc.) If backed by bank deposits, they behave similarly to stablecoins, though if they are backed by other forms of liabilities, they may enter into the remit of securities regulation.

Structural Difference

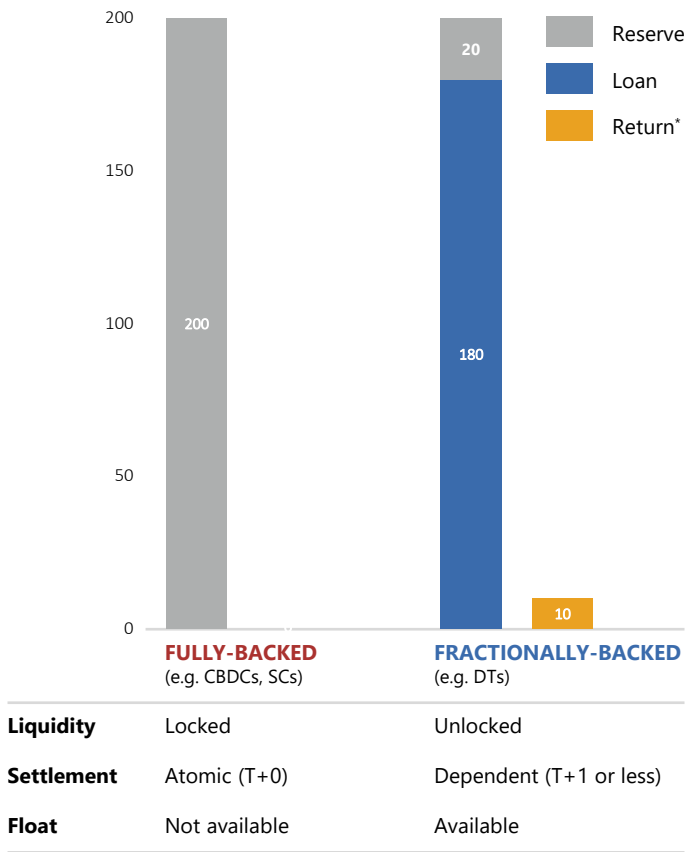
CBDCs & SCs vs. DTs



*Only applicable to deposit taking institutions.
Source: Interviews, BIS, Quinlan & Associates analysis

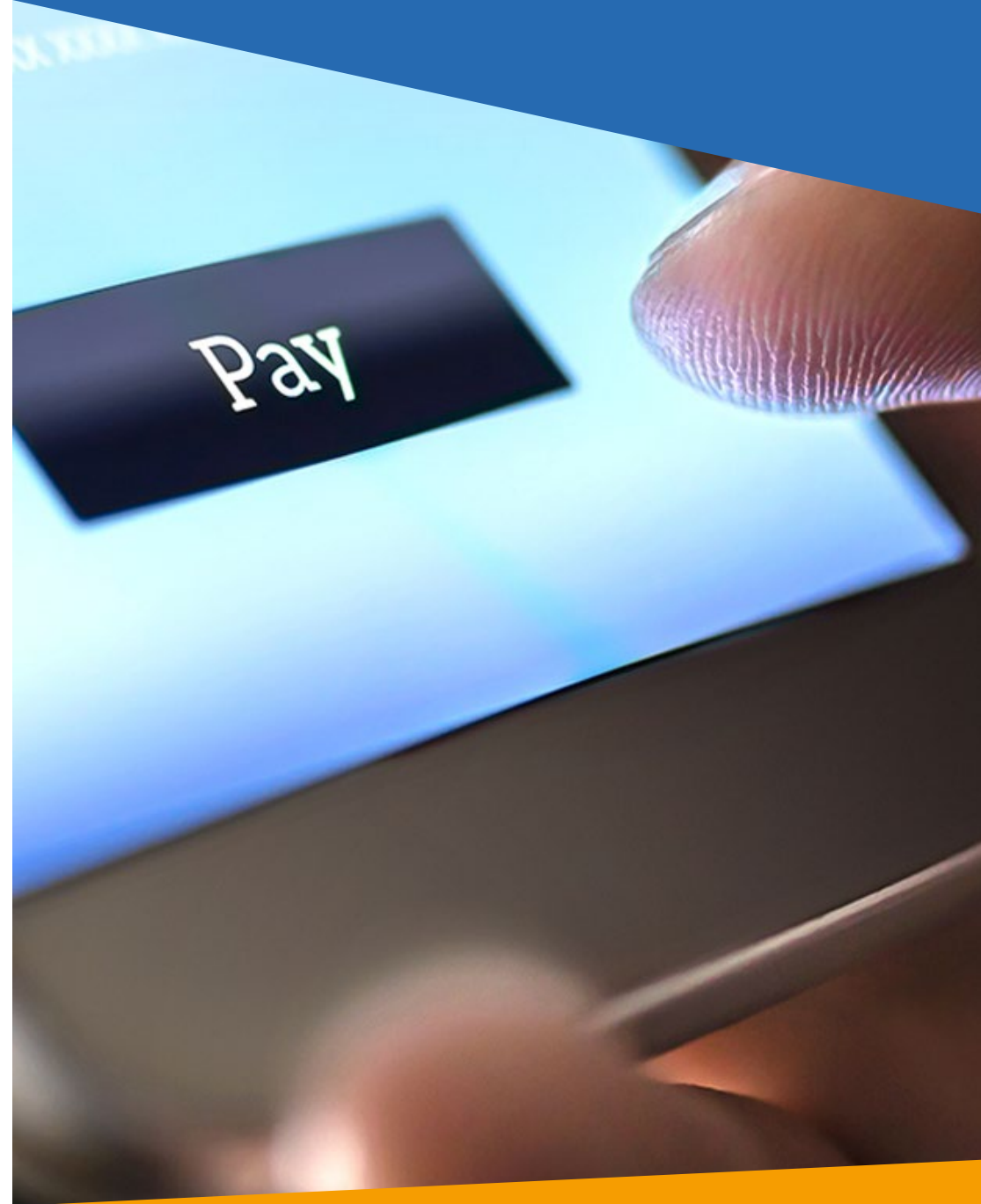
Business Implications

CBDCs & SCs vs. DTs



SECTION 3

ADOPTION EXPLORATIONS



OVERVIEW OF PVP AND DVP

KEY OBSERVATIONS

PvP and DvP settlement arrangements require both parties involved in a transaction to fulfil their obligations prior to settlement as a way to mitigate settlement risk.

The commonality between CBDCs, DTs, and SCs is that they can be used for straight-through processing and end-to-end instant payments / settlement, including PvP and DvP use cases.

The adoption of blockchain / DLT has the potential to materially change key pillars of the financial markets by:

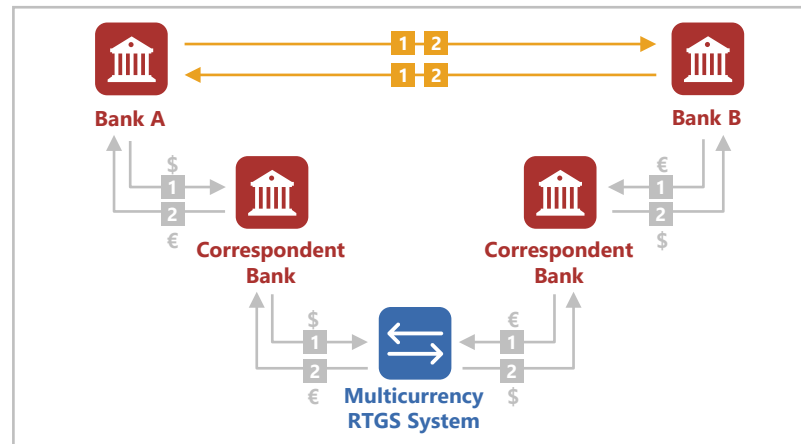
- Automating obligations fulfilment between entities by way of smart contracts, without requiring intermediaries to step in and take charge; and/or
- Enabling real-time / near real-time settlement of money, as well as other assets (e.g. securities) that are tokenised.

By leveraging the capabilities of CBDCs, DTs, and SCs in PvP and DvP settlement, banks and corporate clients stand to gain from increased efficiency, transparency, and a host of other benefits.

As CBDCs, DTs, and SCs may perform the functions of account-based money in a more efficient manner, the key wholesale use cases of these digital assets centre primarily around PvP and DvP settlement and programmability

Payment vs. Payment ("PvP")

Illustrative Diagram



1

Obligation Fulfilment

Bank A intends to buy Euros with USD, so it sends the necessary amount through the correspondent banks and RTGS system (e.g. Fedwire) while Bank B sends an equivalent amount in Euros through the same system

2

Final Money Movement

As Bank A and B meet the conditions for payments and pass AML / CTF / sanctions checks, FX settlement occurs simultaneously, with Bank A receiving Euros and Bank B receiving an equivalent amount in USD

There is one less obligation to be checked by circumventing correspondent banks

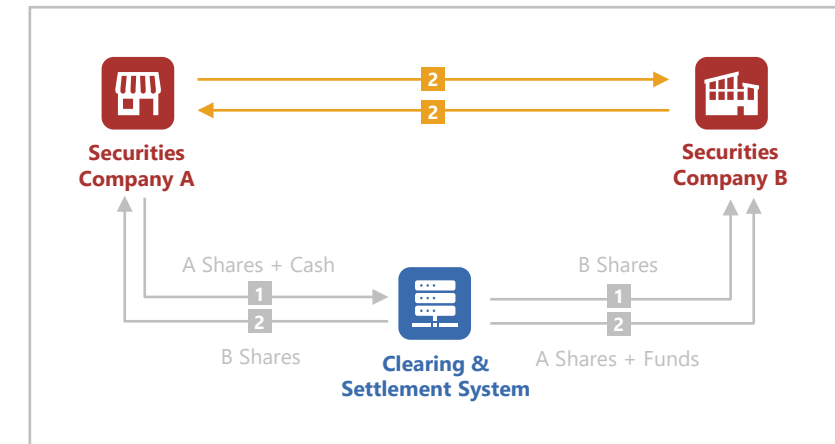
CBDC / TD / SC could facilitate instant transfer of money between entities

*Assuming Securities Company / Clearing Participant A and B only have the transaction above.
Source: Interviews, Quinlan & Associates analysis

Delivery vs. Payment ("DvP")

Illustrative Diagram*

→ CBDC / SC Process
→ Existing Process



1

Obligation Fulfilment

Before the cut-off time, Securities Company A must transfer A shares and pay cash collateral, reflecting the difference in value between A and B shares, while Securities Company B must transfer B shares to the system

2

Final Asset & Money Transfer

After a few hours of processing, the final settlement of securities to both parties (and the funds to be directed to Securities Company B) will only occur if all of the linked obligations are fulfilled

By tokenising money & securities, this step may not be needed

CBDC / SC may facilitate instant settlement of securities

ADOPTION & PAIN POINTS (1/2)

KEY OBSERVATIONS

From a PvP perspective, the adoption of CBDCs, DTs, and SCs could tackle major pain points faced by FIs and their corporate clients, especially in the context of cross-border transactions, through the following:

- **Near Instant Settlement Time:** Enables 24/7, instant, and direct transfer;
- **Increased Transparency:** Customers can gain end-to-end transaction visibility; and
- **Reduced Transaction Cost:** Fees, such as intermediary access fees, could be significantly reduced

RELEVANT QUOTES

By a Payment Company

"The current system suffers from a lack of transparency, which blockchain can resolve."

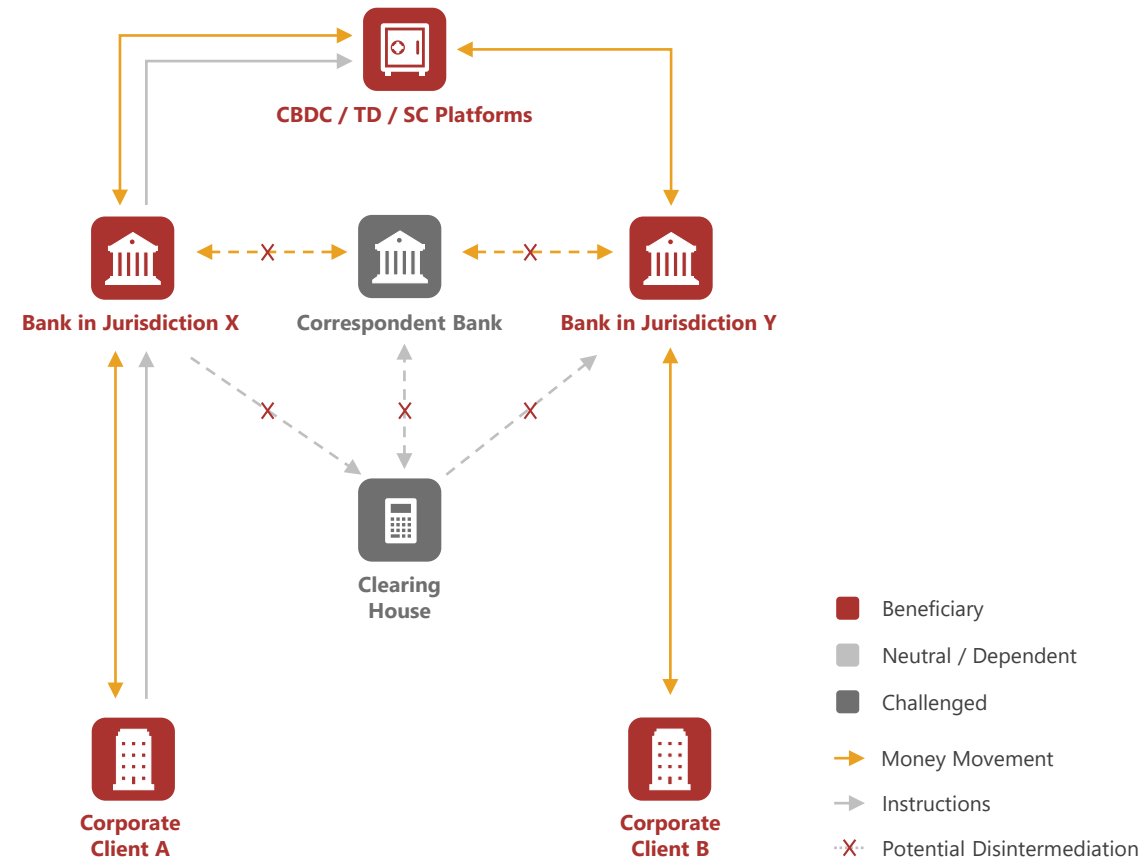
By a Digital Assets Player

"Traditional financing operates on the correspondent model, making it more expensive than using SCs, which allow for direct P2P transactions."

Although the adoption of blockchain / DLT technology may be met with resistance from intermediaries that stand to lose some of their current fees, increased flows (as a result of reduced frictions) and new products and services can benefit innovative intermediaries

Industry Disruption

PvP Perspective



Source: Interviews, Quinlan & Associates analysis

Worthy Endeavour

Wholesale Operation Pain Points

PAIN POINTS



LENGTHY SETTLEMENT TIME

Varying payment cut-off times across regions and the long wait in sequential batch processing may delay settlement



LACK OF TRANSPARENCY

Delivery times often vary when multiple intermediaries are involved, making it difficult to provide real-time traceability



HIGH TRANSACTION COST

Intermediary access fees are often passed on by banks and hence incurred directly by end customers

ADOPTION & PAIN POINTS (2/2)

KEY OBSERVATIONS

From a DvP perspective, the adoption of CBDCs, DTs, and SCs can reduce the same pain points faced by FI and corporates around PVP through:

- **Near Instant Settlement Time:** By tokenising money and other assets (e.g. securities), atomic settlement is possible;
- **Increased Transparency:** Blockchain provides visibility on transactions; and
- **Reduced Transaction Costs:** Enjoy cost savings from cutting down fees.

RELEVANT QUOTES

By a Banking Institution

"The difference between the cut-off time for securities settlement in one location from that in another location ultimately leads to delays in final settlement."

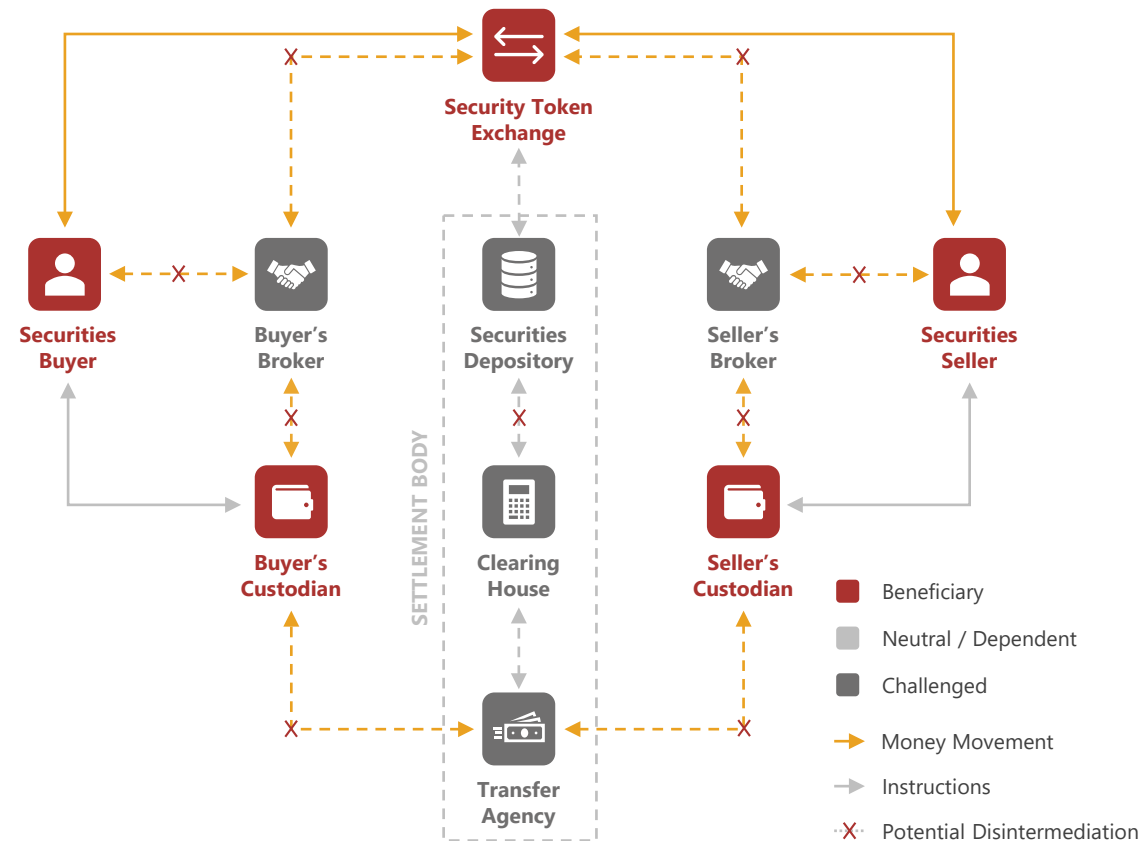
By a Digital Assets Player

"Visibility of the settlement process is an issue that can be solved through tokenisation."

Similarly, the adoption of blockchain technology for DvP settlement could be inherently disruptive to certain market stakeholders, such as brokers and clearinghouses, but it has the potential to bring significant improvements to current settlement processes

Industry Disruption

DvP Perspective



Worthy Endeavour

Wholesale Operation Pain Points

PAIN POINTS



LENGTHY SETTLEMENT TIME

Since securities exist on different systems / networks, it takes a longer time to settle transactions (i.e. up to 2 working days)



LOW TRANSPARENCY

With many more intermediaries involved (e.g. clearinghouse, banks), investors and brokers are often kept out of the loop



HIGH TRANSACTION COST

Securities are on a different ledger from money, creating additional costs (e.g. settlement instruction fee, clearing fee) than a single-ledger PVP

POTENTIAL BENEFITS OF BLOCKCHAIN

KEY OBSERVATIONS

There are a number of salient benefits associated with adopting blockchain / DLT in existing payment rails such as:

- **Data Integrity:** Maintains an immutable record, building trust between institutions;
- **Cybersecurity:** Offers improved protection against cyberattacks;
- **Divisibility:** Enables tokenisation of assets and money; and
- **Programmability:** Executes an automatic command-based conditions.

Of the four benefits, programmability is the most impactful feature in addressing the pain points of the current PvP and DvP processes.

RELEVANT QUOTES

By a Banking Institution

"Blockchain is a game-changer; everything can be represented as a standard token and can be exchanged."

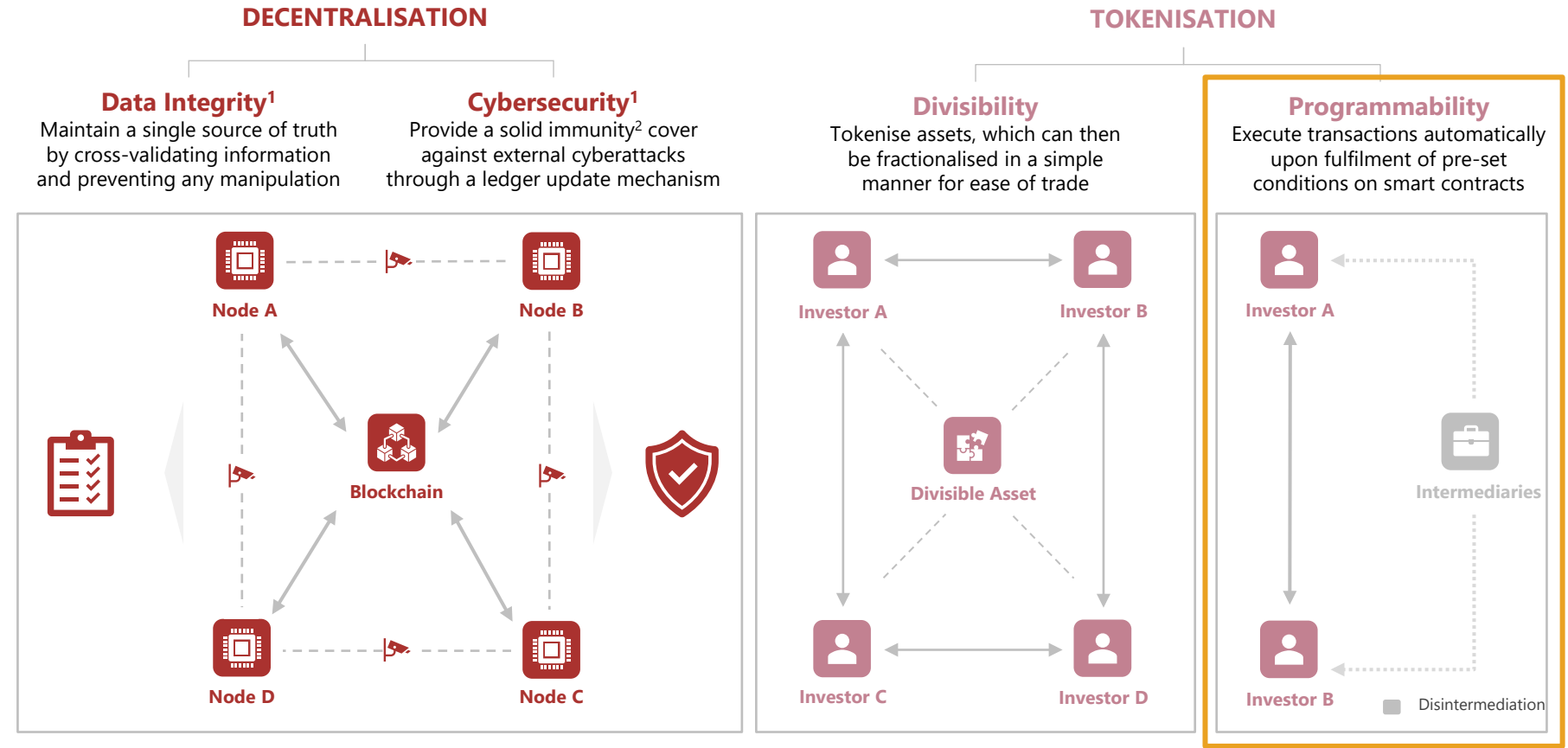
By a Digital Assets Player

"Blockchain enables the triggers for conducting settlement, where value and title transfer(s) can take place."

There are four notable potential benefits that blockchain technology can bring to traditional financial markets, with the enablement of programmability being the most impactful one in terms of addressing existing industry pain points

Notable Potential Benefits

Blockchain Adoption



¹May not be applicable to permissioned blockchains with a single party having majority control; ²The level of immunity can vary depending on whether the blockchain has a quantum-resistant feature.

Source: Interviews, Quinlan & Associates - [Cracking the Code: The Outlook for Digital Securities \(2021\)](#)

KEY BENEFIT: PROGRAMMABILITY

KEY OBSERVATIONS

The following layers of programmability are built upon one another:

- **Policy Level:** Regulation / policies that govern the behaviour of participants;
- **Protocol Level:** Blockchain protocol that allows for smart-contract transactions; and
- **Asset / Token Level:** Code that is embedded directly on the digital asset to behave in a certain way.

Although programmability is issuing-entity agnostic, the level of difficulty in embedding it may depend on the issuing organisation's level of risk tolerance.

RELEVANT QUOTES

By a Payment Company

"As programmability is dependent upon the technology and not on the issuing entity, all tokens using the same technology would have an equal level of programmability."

By a Banking Institution

"Central banks are naturally more risk averse, resisting to place programmed wrappers around CBDCs, as they are unwilling to bear the associated responsibility."

Despite the benefits of smart contracts in addressing transaction inefficiencies / costs, some stakeholders (e.g. central banks) remain hesitant to accept the risks associated with programmability. This aspect can be left to the private sector¹

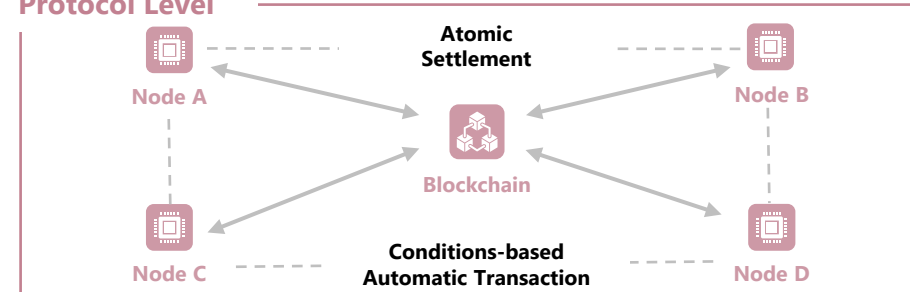
Programmability

Policy, Protocol, and Asset / Token Level

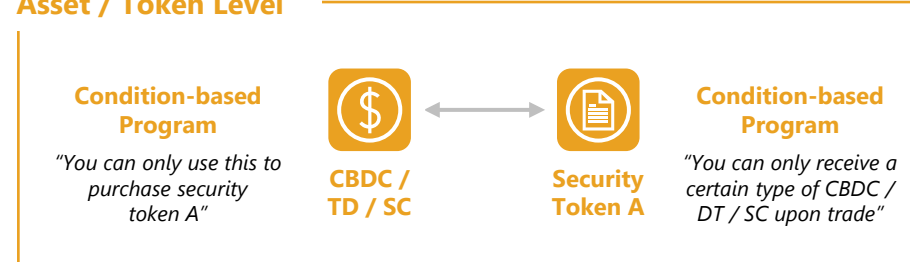
Policy Level



Protocol Level

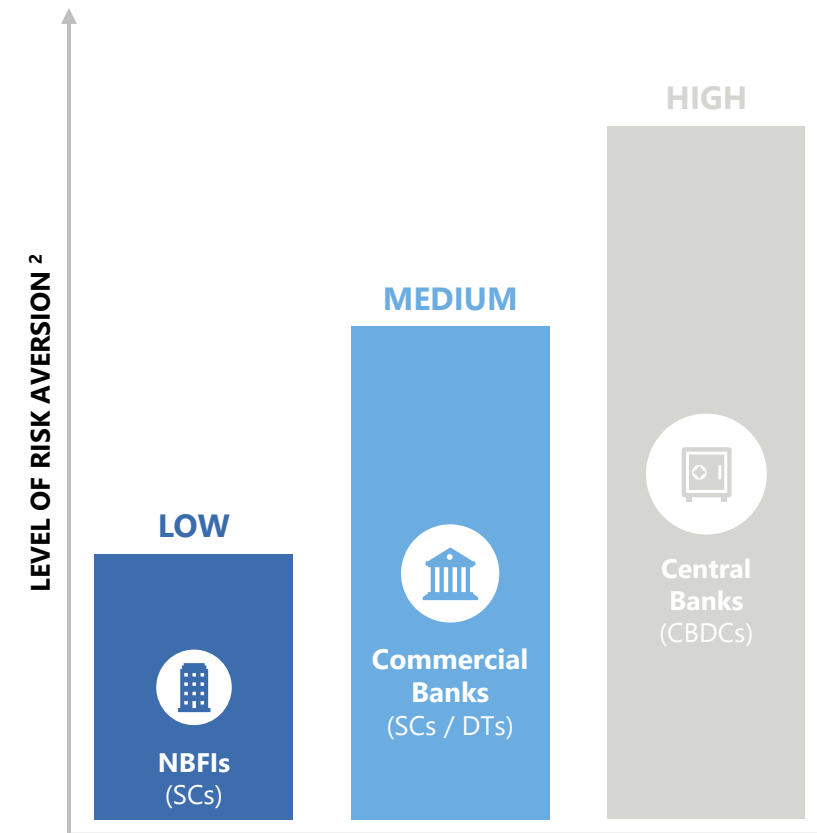


Asset / Token Level



Difficulty of Programmability

Dependent on Level of Risk Aversion



¹See for example BISIH Project Rosalind demonstrating the use of APIs in the context of CBDC; ²The level of risk aversion between NBFIs and commercial banks may converge if the same regulation is enforced.

Source: Interviews, Quinlan & Associates analysis

NOTABLE INITIATIVES

KEY OBSERVATIONS

The number of CBDC projects initiated by public entities has surged in the past few years, with slightly less than one-third of jurisdictions across the globe having explored or currently exploring the use cases of CBDCs:

- Out of the 131 CBDC projects tracked to April 2023, 42 of them have a focus on wholesale adoption.

Meanwhile, the private sector has endeavoured to adopt CBDCs, DTs, and SCs to enhance their existing offerings / propositions:

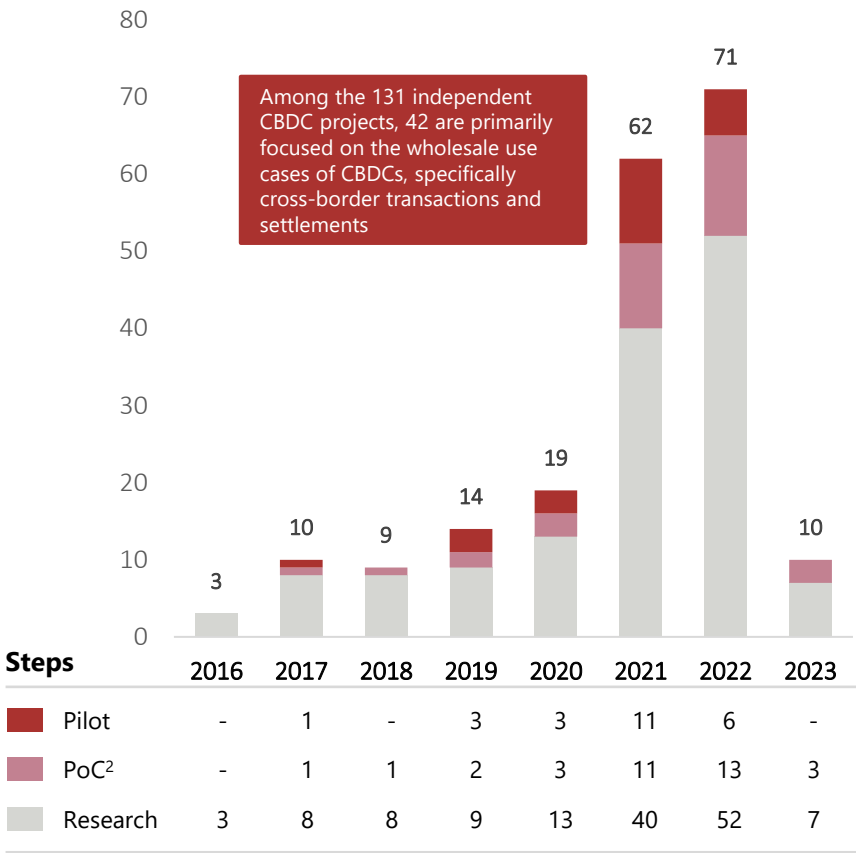
- **ANZ:** A\$DC, issued by the bank, is aimed at automating supply chains, providing near real-time liquidity in a cost-effective manner.
- **Tokyo Kiraboshi Financial Group, Minna no Bank, and the Shikoku Bank:** Three major Japanese banks are exploring the issuance of their own SCs on a public blockchain.

Amidst these ongoing developments, both the public and private sector have been eager to capitalise on the opportunities presented by CBDCs, DTs, and SCs

An increasing number of institutions are exploring the adoption of CBDCs, DTs, and SCs across a wide range of wholesale use cases, including PvP and DvP. Industry players are focusing on PvP use cases, particularly for trade / SME finance, micro-payment, and remittance

Public Sector

CBDC Projects¹, Jan 2016 – Apr 2023



¹The graph below shows a total of 198 initiatives, which accounts for the initiatives that have progressed from research to either PoC or pilot stage; ²Proof-of-concept.
Source: CBDC Monitor, Interviews, GSBN, Linklogis, Sygnum, CoinDesk, MakerDAO, NAB, HSBC, Credit Suisse, Quinlan & Associates analysis

Private Sector

Financial Institutions & Industry Players



FINANCIAL INSTITUTIONS

Many financial institutions are actively exploring the adoption of CBDCs, DTs, and SCs for both PvP and DvP scenarios. Promising outcomes are being observed in their application in both trade finance and fixed income markets



INDUSTRY PLAYERS

Industry participants are leaning towards adopting CBDCs, DTs, and SCs for trade and SME finance. In the case of SCs, cost reduction and efficiency may be gained in the areas of micro-payment and remittance

CBDC WHOLESALE USE CASES

KEY OBSERVATIONS

There are a host of wholesale use cases that industry participants are currently exploring, with the BISIH playing a catalyst role.













Most PvP use cases are related to cross-border payment settlement, while DvP use cases cover issuance and settlement of various securities (e.g. bonds, swaps, etc.).

The financial institutions we interviewed stressed the importance of digital money to settle digital assets efficiently. In tandem, they expressed concerns around adopting digital money that is not issued by central banks or regulated financial institutions.

Considering the vast potential associated with the adoption of CBDCs, DTs, and SCs, the BISIH is actively experimenting with and piloting different initiatives focused on various wholesale use cases

Wholesale Use Cases¹

BISIH Projects & Applications

	1 Jura (Link)	2 Helvetia (Link)	3 Genesis (Link)	4 mBridge (Link 1 & Link 2)	5 Dynamo (Link)
BIS INNOVATION HUB CENTRE	 Switzerland	 Switzerland	 Hong Kong	 Hong Kong	 Hong Kong
CENTRAL BANK PARTICIPANTS	 			 	
RELEVANT CURRENCIES	<ul style="list-style-type: none"> • EUR • CHF 	<ul style="list-style-type: none"> • CHF 	<ul style="list-style-type: none"> • HKD 	<ul style="list-style-type: none"> • HKD • CNY • THB • AED 	<ul style="list-style-type: none"> • HKD
MAIN USE CASE	Cross-border settlement using wholesale CBDC	Settling tokenised assets in wholesale CBDC	Tokenised green bonds with programmed delivery of carbon credits	Multilateral payment platform using multiple CBDCs	Programmability in trade finance using smart contracts for SMEs
PvP	✓	✗	✗	✓	✓
DvP	✓	✓	✓	✓	✗

 Applicable
  Not Applicable

¹The list of wholesale use cases is not exhaustive; use cases showcased here are select examples only; ²Project examples are not exhaustive; ³assuming stablecoin is issued by commercial banks / financial institutions.
Source: Interviews, BIS, Quinlan & Associates analysis

PVP CASE STUDY: TRADE FINANCE

KEY OBSERVATIONS

Problem:
SMEs upstream in the supply chain encounter challenges in gaining access to financing due to their smaller size, lack of quality collateral / sound financials.

Solution:
The stablecoin, Digital Trade Token (“DDT”), allows the anchor buyer to send a smart contract-backed conditional payment to their suppliers.

Outcome:
Before the conditions are met, suppliers can pass the DTT to their upstream counterparts to offset their debt, or to institutional investors to obtain working capital.

RELEVANT QUOTES

By a Digital Assets Player
“A USD 1.7 trillion global financing gap exists, primarily composed of SMEs, which represents a major bottleneck in the pre-shipment phase.”

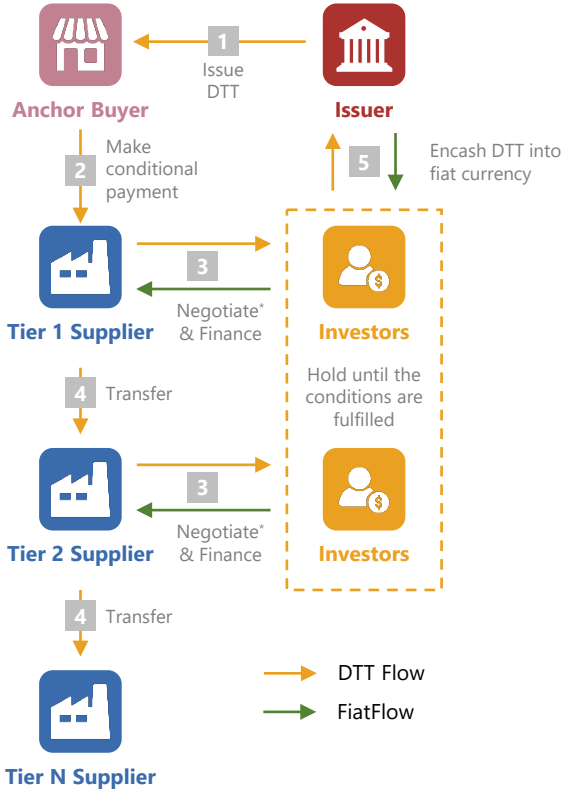
By a Banking Institution
“We have witnessed demand related to stablecoin adoption in trade finance, given supply chains are plagued by inconsistencies in standards across jurisdictions and heavy paperwork, presenting an opportunity for tokenisation.”

As part of BISIH project Dynamo, the Digital Trade Token (“DDT”) explored how to tackle the SME trade financing gap through programmability and improved data transparency

Case Study

Linklogis

ACTION	<ul style="list-style-type: none">AcceptRejectValidate
TIME	<ul style="list-style-type: none">Specific DateWithin set period
CAPTURED DATA	<ul style="list-style-type: none">KYC Data (e.g. identity verification, whitelisting controls etc.)Shipment Data (e.g. eBL holder, vessel tracking, inspection, customs clearance status, IoT location tracker, etc.)ESG Data (e.g. ESG performance, labour management, pollutants, material consumption, greenhouse gas emissions, etc.)



Industry Pain Points & Outcome

Linklogis

PAIN POINTS

* FINANCING GAP

SMEs have difficulties in securing trade financing, with over 40% of their applications getting rejected globally

OUTCOME

✓ REDUCED COUNTERPARTY RISKS

The transparency of supply chain ecosystem data allows for better risk assessment by banks and investors

✓ IMPROVED RESILIENCY

Upstream suppliers can better secure financing riding on the anchor buyer’s creditworthiness (i.e. transferability)

✓ BETTER CAPITAL ACCESS

Allows for a wider range of investors that are not originally eligible or interested in trade financing, to provide funding

*Negotiate on financing ratio and discount amount.

Source: BISIH Project Dynamo ([link](#)), Asia Development Bank, Interviews, Quinlan & Associates analysis

DVP CASE STUDY: FIXED INCOME

KEY OBSERVATIONS

Problem:

The settlement of bond issuance commonly involves record-keeping of ownership details, rights, obligations, and cash flows throughout the entire issuance process, which takes T+5, on average, while also incurring reconciliation costs and sales costs due to the very low transparency of information

Solution:

Goldman Sachs' Daml-based tokenisation platform, GS DAP, is able to facilitate atomic Delivery versus Payment (DvP) settlement across the bond issuance process, leveraging private blockchains

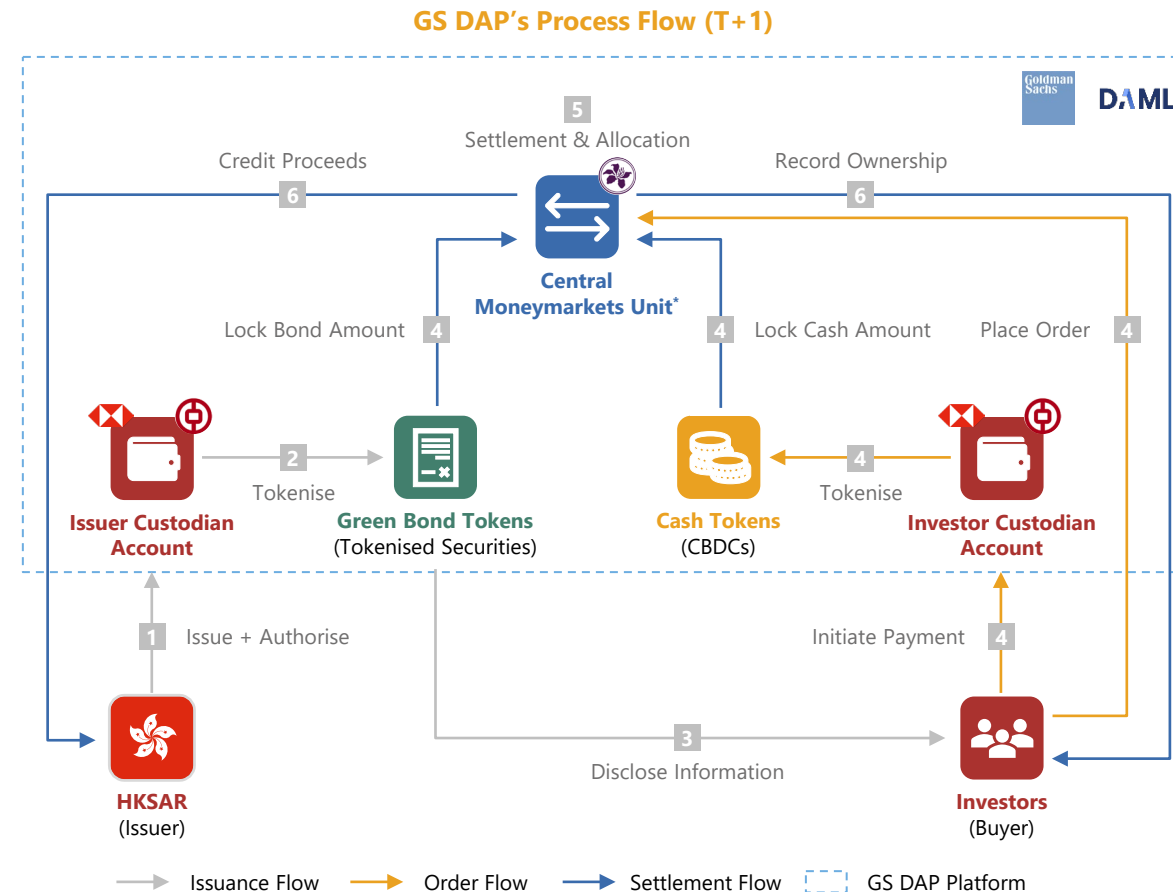
Outcome:

(1) Increased information transparency across the issuance process, (2) reduced reconciliation and sales costs by automating the record keeping process, and (3) enhanced efficiency to operate on a T+1 basis

As a follow-up to BISIH project Genesis, Goldman Sachs, in collaboration with the HKMA, facilitated the primary issuance of HKD 800 million of tokenised green bonds for the HKSAR government, which was settled on a DvP basis, leveraging its tokenisation platform, GS DAP

Case Study

Goldman Sachs - GS DAP™, Green Bond Issuance



*Hong Kong's clearing and settlement system for debt securities owned by the HKMA.

Source: Project Genesis ([link](#)), HKMA, Digital Assets, Quinlan & Associates analysis

FEATURES



OPERATED WITH DAML

GS DAP is a tokenisation platform developed on top of Digital Asset's Daml smart contract language



POWERED BY PRIVATE CHAIN

GS DAP is also powered by Digital Asset's privacy-enabled enterprise blockchain, Canton



TOKEN SUPPORTED BY HKMA

Cash tokens adopted in the process represent a claim for HKD fiat against the HKMA (i.e. CBDCs)

BENEFITS



GREATER TRANSPARENCY

Investors have real-time visibility of bond information, and the obligations and rights are also captured transparently



REDUCED COSTS

Sales information and ownership records are automated, which reduces sales and reconciliation costs dramatically



ENHANCED EFFICIENCY

While a typical bond issuance settlement operates on a T+5 basis, GS DAP shortens it to T+1

SECTION 4

MARKET DEVELOPMENT



THE INEVITABLE CHALLENGE

KEY OBSERVATIONS

Institutions often end up exploring and executing technology initiatives in silos due differences in corporate priorities and operational practices.

Expecting technology adoption to happen in a unified manner, with standardised technology and practices, is highly idealistic.

As such, it is evident that current blockchain initiatives, especially those focused on wholesale use cases, are being developed independently / in silos.

There are a number of examples across:

- **Single-jurisdiction** CBDCs.
- **Cross-jurisdiction** CBDCs.
- **Intrabank** blockchain initiatives; and
- **Interbank** blockchain initiatives.

RELEVANT QUOTES

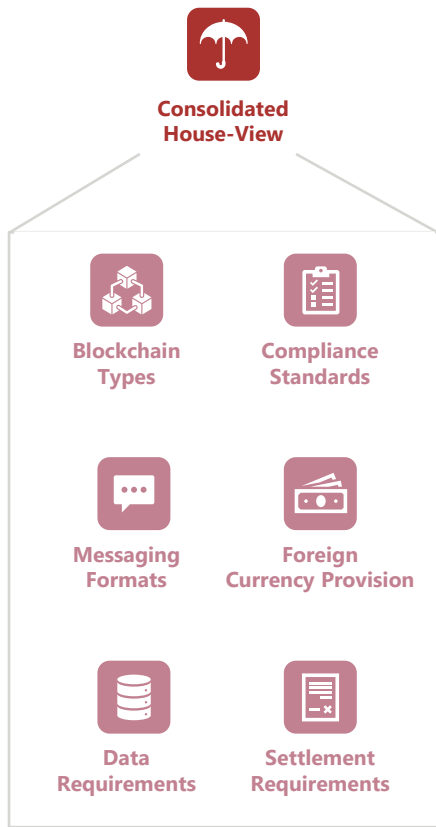
By a Payment Company

"Developing a house view is impossible because each organisation would have to consider a fit-for-purpose technology that meets their own privacy, scalability, and overall performance needs."

Developing a consistent, industry-wide view on technological initiatives can be challenging, given it requires significant alignment across various organisations' priorities. As such, siloed development and experimentation is common in early phases of technology development

Industry Convergence

Technological Initiatives



Challenge Drivers:

- 1 Corporate Strategy**
Financial institutions have varying levels of understanding and differing objectives associated with technological initiatives that are aligned with their internal and external business needs
- 2 Operating Procedures**
Variances in decision-making processes and resource allocation can lead to differences in operational procedures, which can result in varying implementation timelines
- 3 Level of Risk Tolerance**
Financial institutions are inherently risk-averse due to their obligation to maintain a high level of security and compliance, resulting in differences in system maturity and internal standards
- 4 Legacy Systems**
Many FIs have legacy systems that are difficult to integrate with new technologies, which can lead to differing opinions on how to prioritise various technological initiatives
- 5 Reluctance to Share Proprietary Information**
Sharing proprietary information on internal technological initiatives may discourage industry-wide alignment because institutions may be hesitant to give up their competitive edge

Siloed Experimentation & Development

Examples

[SINGLE-JURISDICTION] CBDC INITIATIVES

- United States: Project Hamilton
- Switzerland: Project Helvetia
- Singapore: Project Orchid

[CROSS-JURISDICTION] CBDC INITIATIVES

- France & Switzerland: Project Jura
- Hong Kong, Thailand, UAE¹, and PRC: Project mBridge
- UAE & Saudi Arabia: Project Aber
- Australia, Malaysia, SG, and South Africa: Project Dunbar

[INTRABANK] BLOCKCHAIN INITIATIVES

- J.P.Morgan: For internal corporate banking activities
- Santander Bank: For cross-border payment solutions
- HSBC: For payment within its balance sheet

[INTERBANK] BLOCKCHAIN INITIATIVES

- J.P.Morgan: Onyx
- Marco Polo Network
- Contour
- Project Ubin: Singapore

INTEROPERABILITY SOLUTIONS

KEY OBSERVATIONS

Given the difficulty in developing a consolidated “house view”, coupled with the siloed nature of projects (and varying preferences on the types of blockchain technology), interoperability solutions will be essential in helping to unlock the full potential of CBDCs, DTs, and SCs through enabling scalability.

Many existing market infrastructure participants, messaging platforms, and technology solution providers are actively developing interoperability platforms to connect various independent networks and institutions together.

RELEVANT QUOTES

By a Digital Assets Player

“Interoperability is a crucial component in bringing together different systems, platforms, entities, and rails, embracing both new and existing payment rails and minimising friction, whenever possible.”

By a Payment Company













“By launching an interoperability platform, we are helping central banks and commercial banks explore a wider range of use cases and the design of bilateral experiments.”

As interoperability is key to the broader adoption of CBDCs, DTs, and SCs, a number of FMIs that facilitate settlement, as well as leading technology providers, are developing their own interoperability platforms

Interoperability Initiatives

CBDC, DTs, and SCs

✓ Applicable - Dependent ✗ Not Applicable

Examples	Stakeholders	CBDC	DT	SC
Regulated Liability Network (“RLN”) A blockchain-powered shared ledger that enables transactions involving any CBDCs, tokenised bank deposits, and e-money	  	✓	✓	✓ ²
CBDC Interoperability Experiment An experiment to enable cross-border payments by interlinking various domestic CBDC networks	 	✓	✗	✗
Universal Payment Channel A platform that connects DLT networks with different protocols to facilitate both wholesale and retail-level payments		✓	- ¹	✓ ²
DLT-based Messaging Network A blockchain-based messaging network that facilitates communication between regulated SC and CBDC networks		✓	✓	✓ ²
Digital Currency Single-window Platform A platform that enables the global transfer of regulated digital assets by integrating permissioned and permissionless ledgers	 	✓	- ¹	✓ ²
Blockchain World Wire A network of shared distributed ledgers of digital assets for fast and secure atomic payment, clearing, and settlement		✗	✓	✓ ²
Decentralised Financial Market Infrastructure (“FMI”) Network A DLT-based regulated payment system that distributes the function of an FMI across the user base and connects business platforms to facilitate atomic PvP and DvP settlement		✓	- ¹	✗
Blockchain-based Clearing & Settlement Network A live, discoverable network of banks that facilitates atomic clearing and settlement of cross-border payment transactions, as well as DvP		✓	✓	✓ ²

¹May be included, dependent upon the scope of digital assets facilitated in the initiatives; ²Only regulated stablecoins.

Source: Interviews, Citi, SWIFT, SETL, Visa, UDPN, Freeflow Finance, finality, Quinlan & Associates analysis

CASE STUDY: RLN

KEY OBSERVATIONS

The RLN is currently in the PoC stage and is a joint project involving major institutions such as Citi, HSBC, Mastercard, and SWIFT.

If the RLN comes to fruition, all regulated liabilities, including central bank money, commercial bank money, and electronic money, would co-exist and be tokenised on a shared ledger.

RELEVANT QUOTES

By a Banking Institution

"By bringing all liabilities on-chain in a single, shared ledger, the RLN can effect transactions between accounts in different ecosystems via atomic settlement, which does not exist today."

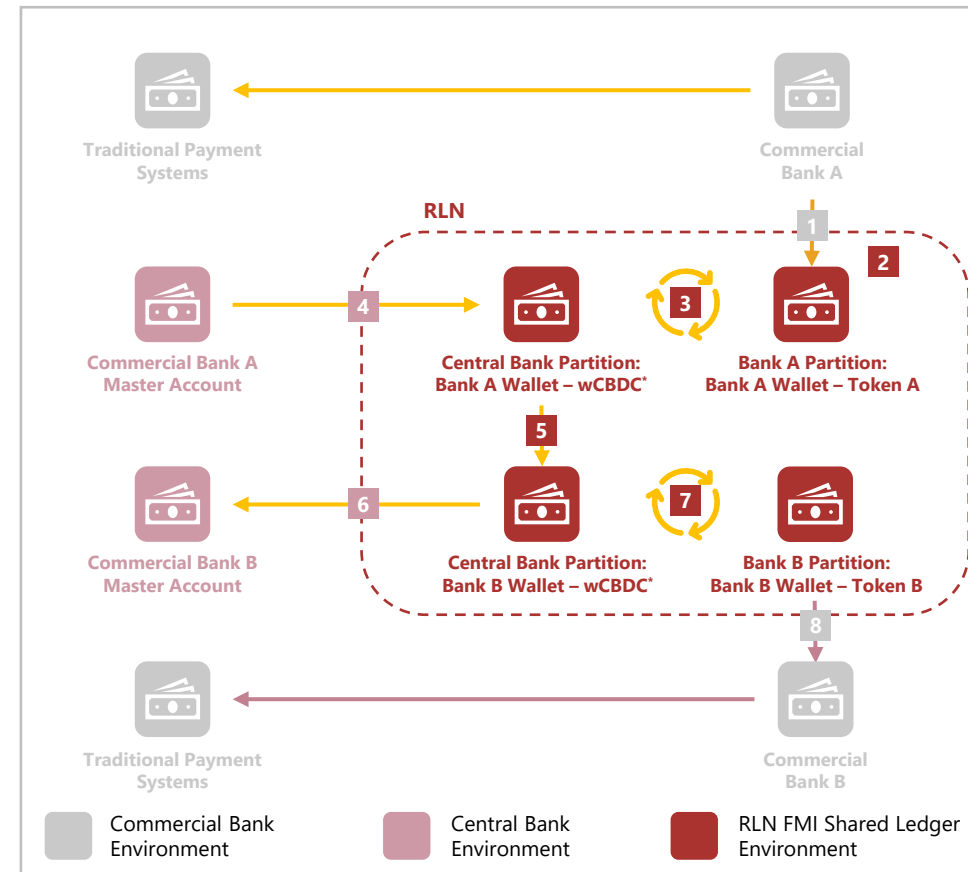
By a Digital Assets Player

"The RLN brings a host of benefits to the ecosystem including a faster settlement approach, being applicable to different currencies for different assets, as well as reducing fragmentation since everything becomes a token."

The concept of an RLN aims to achieve finality of settlement between participants (e.g. commercial banks, central banks, etc.) over a shared ledger, which is to be operated by a regulated FMI

Value Chain

Process Flow



*Wholesale CBDC

Source: RLN Whitepaper ([link](#)), Quinlan & Associates analysis

- CURRENCY CONVERSION**
A customer of Commercial Bank A transfers a part of their deposit balance to an RLN balance
- PAYMENT INSTRUCTION**
The customer instructs a payment to a counterparty at Commercial Bank B
- INSTRUCTION EVALUATION**
The RLN evaluates Commercial Bank A's ability to execute the end-to-end transaction
- TREASURY CHECK**
Commercial Bank A ensures that sufficient wholesale CBDC is available in its RLN Wallet
- VALUE TRANSFER BY COMMERCIAL BANK A**
The wholesale CBDC is transferred within the RLN, away from Commercial Bank A's master account
- VALUE TRANSFER TO COMMERCIAL BANK B**
Commercial Bank B has real-time visibility of the amount being transferred to it
- BALANCE UPDATE**
The balance is automatically updated in the relevant partitions and a single settlement record is created
- PAYMENT RECEIPT**
The transaction beneficiary may transfer the RLN Token balance to its deposit account

CASE STUDY: UDPN

KEY OBSERVATIONS

The UDPN is a permissioned blockchain network designed to connect various digital currency systems across multiple platforms and protocols, facilitating seamless and efficient payments for regulated SCs and, eventually, CBDCs.

It operates as a co-governed platform, enabling third-party smart contract deployment and execution for enhanced transparency and time / cost efficiency.

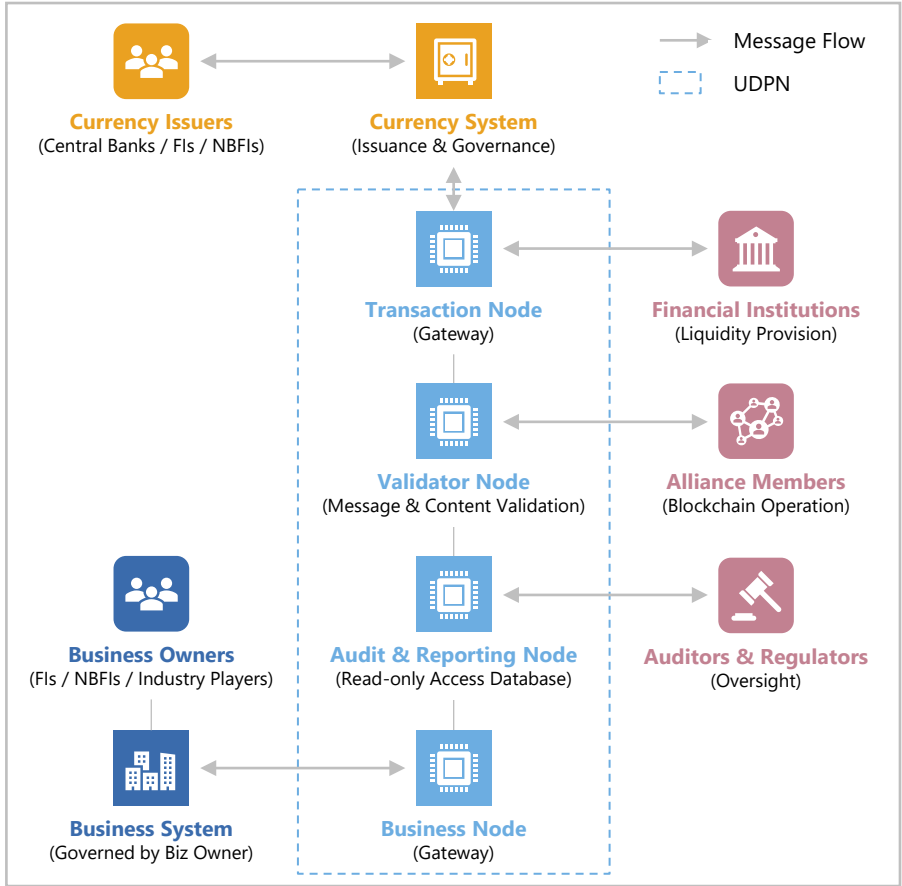
Although the UDPN does not directly serve end-users, it grants relevant entities access to its system that equips them with capabilities, such as digital currency transfer, swaps, and many more.

As the UDPN is linked with accounts and wallets on other SC and CBDC systems for facilitation purposes, all transactions are executed and recorded within their respective CBDC or stablecoin systems.

The UDPN aims to solve the issue of interoperability by establishing a regulated payments network on a permission-based blockchain that can support regulated digital currencies on all technical platforms

Value Chain

Process Flow



*Those available on public blockchain environment (e.g. USDT, USDC, etc.).
Source: UDPN, Interviews, Quinlan & Associates analysis

Proof-of-Concept & Development Timeline

2022

Proof of Concept	Kick-off	Closed
Asset Issuance & Circulation		
Bank Stablecoin	25 th Mar	15 th Jun
CBDC (Hybrid Model)	1 st Jun	31 st Dec
Core Functionalities		
Digital Currency Transfer & Swap	15 th Mar	15 th Jun
Digital Currency Payment Gateway for E-Commerce	5 th Apr	15 th Jun
Digital Asset Tokenisation	20 th Apr	30 th July
User Experience		
Enabling Gasless Transactions using Stablecoins*	20 th Mar	15 th Jun
Purchasing Digital Currencies with Fiat Money	1 st Apr	15 th Jun
Facilitating Foreign Exchange on Digital Currencies	31 st Apr	31 st Oct
Compliance-related Functionalities		
Travel Rule	10 th Mar	15 th Jun
Cross-institution KYC Verification	15 th Apr	15 th Jun

CASE STUDY: PARTIOR

KEY OBSERVATIONS

Partior is a live blockchain network that is interoperable with existing RTGS and RTP systems, with the potential to be interoperable with forthcoming CBDC networks.

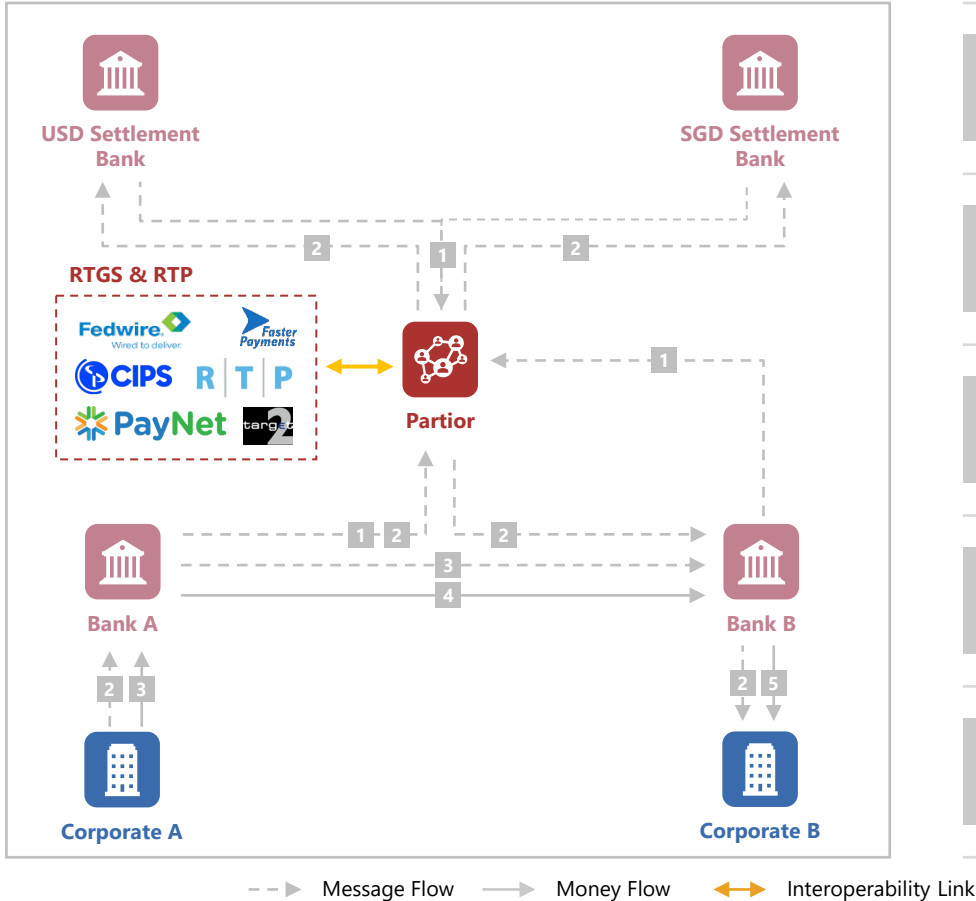
By being a part of the Partior network, financial institutions can perform around-the-clock, atomic settlement of currencies and securities, with end-to-end transaction visibility.

As a result, joining Partior allows financial institutions to tackle major pain points experienced by their end corporate clients in cross-border settlements.

As a globally interoperable and open platform, Partior enables atomic clearing and settlement of programmable money across jurisdictions, linking with RTGS and other networks that may not be operating 24/7

Value Chain

Process Flow



Source: Partior, Vulcan Post, Interviews, Quinlan & Associates analysis

1

INITIAL ONBOARDING

Partior onboards global transaction banks that handle most of the cross-border clearing services, as well as a settlement bank for each of the major currencies. into its network

2

PAYMENT INSTRUCTION

When Corporate A sends an instruction to Bank B to pay a certain amount to Corporate B, the same standard message is instantly directed to the Partior network, the two settlement banks, and Bank B

3

INSTRUCTION EVALUATION

Bank A conducts the necessary sanction checking on Corporate A, Bank B and Corporate B (intended recipient), and holds the amount of deposit balance of Corporate A

4

REAL-TIME SETTLEMENT

Upon checking, Partior enables Bank A to send money to Bank B in real time without having to go through correspondent banks, therefore shortening the settlement time with centralised clearing in the Asian time zone

5

FINAL MONEY MOVEMENT

After receiving the funds from Bank A, Bank B transfers the amount to Corporate B's deposit account, thus completing the final settlement

CASE STUDY: ISO 20022

KEY OBSERVATIONS

Interoperability applies not only to different technologies and networks, but also to messaging standards, which ensures consistency in communication between financial institutions in order to facilitate speedy payment settlement.

Although the Swift’s Message Type (“MT”) format has long been the standard for financial communication, many financial institutions are actively deploying the ISO 20022 standard in conjunction with SWIFT.

ISO 20022 Highlight

- **Compatibility:** XML based, which allows easier straight-through processing (“STP”) for IT systems.
- **Comprehensiveness:** Relevant data (e.g. unique invoice identifier, conditions, involved agents, etc.) of more than one associated transaction can be embedded in a single message for reconciliation.

ISO 20022 can be adopted as a standardised messaging protocols for digital assets transactions.

Interoperability can be achieved in various ways (and by various means), such as by standardising messages, with several FIs working closely with SWIFT to replace its MT messaging standard with ISO 20022, facilitating real-time, cross-border payment settlement

Key Differences

SWIFT MT vs. ISO 20022

Criteria	SWIFT MT	ISO 20022	Description	<div> <div>✓</div> <div>Covered</div> <div>✗</div> <div>Not Covered</div> </div>
Language	Proprietary	XML	Compatibility of XML language allows easier STP across various IT systems	
Information Coverage	Narrow	Wide	Relevant single or multiple transaction(s) data can be embedded for enhanced reconciliation	
Group Header¹				
Creation Date / Time	✗	✓	Date and time at which the message was create	
Number of Transactions	✗	✓	Number of individual transaction(s) contained in the (single) message	
Settlement Information	✗	✓	Specifies the details on how the settlement of the transaction(s) between parties is complete	
Settlement Information²				
Credit Transfer Information	✗	✓	Set of elements providing information specific to the individual credit transfer(s)	
Payment Type Information	✗	✓	Set of optional elements used to further specify the type of transaction	
Previous Instructing Agent	✗	✓	Agent immediately prior to the instructing agent	
Previous Instruction Agent Account	✗	✓	Unambiguous identification of the account of the previous instructing agent	
Intermediary Agent Account	✗	✓	Unambiguous identification of the account of the intermediary agent at its servicing agent	
Creditor Agent Account	✗	✓	Unambiguous identification of the account of the creditor agent at its servicing agent	
Ultimate Debtor	✗	✓	Ultimate party that owes an amount to the (ultimate) creditor	
Initiating Party	✗	✓	This can either the debtor or a party that initiates the credit transfer on behalf of the debtor	
Ultimate Creditor	✗	✓	Ultimate party to which an amount money is due	

¹Set of characteristics shared by all individual transactions included in the message; ²Specifies the details on how the settlement of transaction(s) between the instructing agent and the instructed agent is completed.
Source: Interviews, ISO, SWIFT, Citi, Quinlan & Associates analysis

SECTION 5

REGULATORY PERSPECTIVES





SECTION 5.1

EXISTING REGULATIONS

EXISTING RULES & STANDARDS

KEY OBSERVATIONS

The Financial Stability Board ("FSB") delineates eight key activities involved in a stablecoin arrangement, designed to (1) assess potential vulnerabilities, (2) identify mitigation measures, and (3) map out relevant international standards.

It is important to recognise that many of these activities, such as issuing digital assets, managing reserve assets, and operating the infrastructure, are also pertinent to the operations of DTs.

It is noteworthy that numerous jurisdictions have already instituted applicable regulations (e.g. AML / CTF, data privacy, investor protection, etc.) to supervise these activities. Furthermore, there are global standards, principles, and recommendations established by the Financial Action Task Force ("FATF"), BIS, and the International Organisation of Securities Commissions ("IOSCO") that regulate these activities.

Respective IGOs continue to evolve relevant global standards as the market gains insights from various adoption exploration efforts.

Across the eight key activities identified by the FSB for SCs, many of which are relevant to DTs, many jurisdictions across the globe have already established regulations, supplemented by global standards endorsed by prominent IGOs

Activities in a Stablecoin Arrangement	Operational Design Element	FATF ¹	Basel	PFMI ⁴	IOSCO
Establishing rules governing the stablecoin arrangement	• The rules covering the types of entities, the protocol for validating transactions, and the management / ownership of the reserve assets.	✓	✓ ²	✓	✓ ⁵
Issuing, creating, and destroying stablecoins	• The mechanism through which stablecoins may be issued or created, and subsequently destroyed by one or more entities / protocols.	✓	✓ ³	✓	✓ ⁶
Managing reserve assets	• The activities of managing the underlying assets (e.g. financial assets, crypto assets, etc.) that are "backing" the value of a stablecoin.	✓	✓	✓	✓ ⁷
Providing custody / trust services for reserve assets	• The activity of holding the assets that are "backing" the value of a stablecoin by either the issuer or other entities.	✓	✓	✓	✓ ⁸
Operating the infrastructure	• A blockchain / DLT protocol determining roles in and access to the system: permissioned-based vs. permissionless.	✓	✓	✓	×
Validating transactions	• The mechanism by which a transaction is authorised and validated by validator nodes (e.g. proof-of-work, proof-of-stake, etc.).	×	✓	✓	×
Storing the private keys that gives access to stablecoins	• Cryptographic wallets storing private and public keys that are used to digitally sign transaction instructions.	✓	✓	✓	×
Exchanging, trading, reselling, and market making of stablecoins	• The activity of purchasing and exchanging a stablecoin with fiat currencies (or a stablecoin) with other stablecoins or crypto-assets.	✓	✓	✓	✓ ⁹

✓ Applicable - Dependent × Not Applicable

¹Various FATF Standards covering AML / CTF guidance;

²Basel Framework and associated principles for supervision and colleges; ³Basel Framework and Principles for the sound management of operational risk;

⁴CPSS-IOSCO Principles for Financial Market Infrastructures ("PFMI");

⁵IOSCO Principles Cross-Border Supervisory Cooperation; ⁶Principles for the Regulation of Exchange Traded Funds; ⁷Liquidity Risk Management & Policy Recommendations for MMFs;

⁸Recommendations Regarding the Protection of Client Assets; ⁹Principles 13-15 & 30-39.

Source: FSB – [Addressing the regulatory, supervisory and oversight challenges raised by "global stablecoin" arrangements: Consultative document](#)

BLOCKCHAIN TYPES / REG. IMPLICATIONS

KEY OBSERVATIONS

One of the key initial stages in blockchain adoption is the choice of a blockchain protocol, and it is here where we have observed a lack of industry convergence begins, given the divergence in views on the potential benefits (and limitations) of different types of blockchains and how the wider industry will evolve.

One of the key differences between (1) private / consortium blockchains and (2) public blockchains is that 'blockchain native (i.e. on-chain) activities' on the latter are anonymous in nature, which makes regulatory compliance challenging.

Considering that regulation is activity rather than technology based, the principle of "same risk, same regulation" is emphasised by policy setters.

Throughout our interviews, we have observed a preference for private / consortium blockchains in the context of wholesale adoption, primarily due to the greater ease to comply with existing standards and control measures imposed on various wholesale financial activities

INTERVIEW FINDINGS			NOTABLE CHARACTERISTICS		
Level of Preference (% Responses, n = 29)	Supporting Views (Aggregated)	Opposing Views (Aggregated)	Ownership of Network (Protocol)	Participation (Node & Network)	Level of Control (On-chain Activities)
<div>Private / Consortium Blockchain</div> <div><div></div>48%</div>	Most enterprise adoption explorations could be supported by private blockchains, which are relatively easier to maintain and manage	Building a consortium or working with a vendor can be a time-consuming and expensive process. Scalability is also highly questionable	<ul style="list-style-type: none">Single Entity (Private)Selected Entities (Consortium)	Only verified by a single or selected group of entities	<div>High</div> Through greater centralisation of governance / control, at the cost of potential manipulation of on-chain data and activities
<div>Public Blockchain</div> <div><div></div>24%</div>	Public blockchains have high resilience and robust governance, with low costs and the ability to process transactions quickly	Public blockchain may fall short in complying with AML regulations, as they lack necessary tools and /or mechanisms	<ul style="list-style-type: none">Nobody (Theoretically)	Anyone who wishes to participate as a node or leverage the selected network's capability	<div>Low</div> On-chain activities are, by nature, irreversible and anonymous - with the option to create new compliance protocols (see example on travel rule on the next slide).
<div>Blockchain Agnostic</div> <div><div></div>28%</div>	Since the technology is still in its early stages of development, it is important to remain cautious when drawing conclusions. However, we remain open to exploring new technologies to meet the evolving demands of the market				

Regulatory Concern

CASE STUDY: ENTITY-LEVEL AML

KEY OBSERVATIONS

With the aim to achieve KYC compliance in the context of the use of public blockchains, there are several compliance solutions available in the market, including:

- **(1) Hosted Wallet:** The selected solution provider offers corporates access to a range of compliance functions through its 'Institutional Wallet' offering.
- **(2) Data Privacy Solution:** The selected solution provider provides information on a transaction, regardless of when the receiving Virtual Asset Service Provider ("VASP") signs up, enabling compliance with the travel rule.

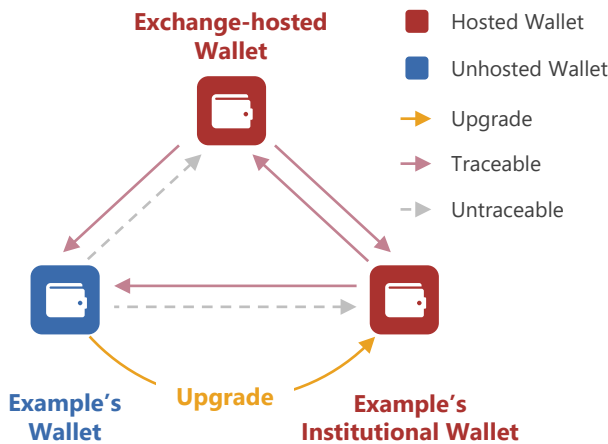
RELEVANT QUOTES

By a Digital Assets Player
"What makes these privacy solutions extremely secure is that VASPs are the only stakeholders who have access to the data and possess the legal responsibility under data protection laws to store and hold information."

To adhere to FATF guidance on AML / CTF and Travel rules, some wallet providers have introduced a hosted wallet with various functionalities, while other solutions enable the automated verification of KYC information

Hosted Wallet

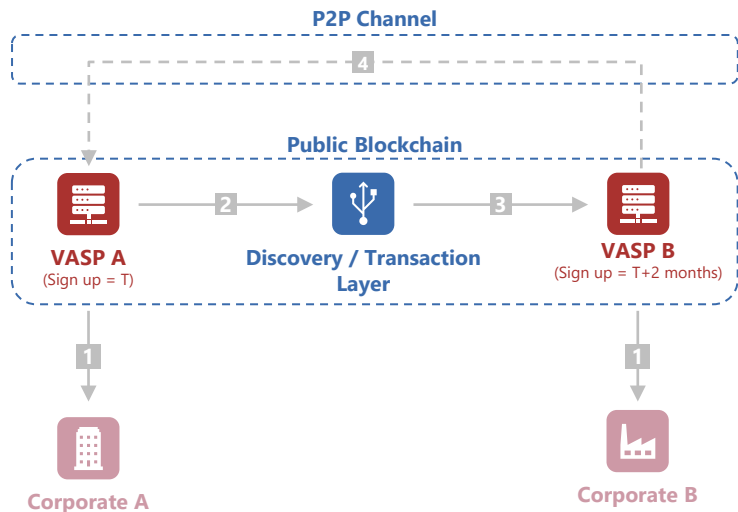
Selected Anonymised Example*



Wallet Features	Example's Wallet	Example's Institutional Wallet
Custody	<ul style="list-style-type: none">Self-custody	<ul style="list-style-type: none">Multiple custodians available
Compliance	<ul style="list-style-type: none">Zero KYC	<ul style="list-style-type: none">KYC checksReal-time reportingIdentification of risky behavior

Data Privacy Solutions

Selected Anonymised Example*



- 1 VASPs are required to perform KYC on their users
- 2 VASP A registers on Day 0 and sends out a transaction RFI
- 3 Although VASP B joins 2 months after, it receives the RFI from Day 0
- 4 VASP B sends travel rule data from Day 0 RFIs to VASP A directly

CHALLENGES

- SUNRISE PERIOD**
As VASPs in different jurisdictions comply with regulations at different times / ways, travel rules may not be met
- DATA PRIVACY**
Customers may be exposed to data privacy risks, caused by data mining / user data sent to the wrong VASP

SOLUTION

- HISTORIC LOOKBACK**
Through immutable on-chain records to look back to, travel rules can be met as all VASPs are in compliance
- P2P DATA TRANSFER**
VASPs could exchange information on a secure P2P channel, without data being stored on the solution illustrated above

*The anonymised examples above are non-exhaustive case studies that are showcased for illustrative purpose only.
Source: Interviews, Quinlan & Associates proprietary research & analysis



SECTION 5.2

NEW REGULATIONS

REGULATORY HURDLES

KEY OBSERVATIONS

Due to the lack of a clearly defined legal classification for SCs, there is no clear accountability for entities involved in their issuance and usage, creating opportunities for regulatory arbitrage, while limiting protection for holders of SCs.

The same views are shared by most industry players, who emphasise the need for regulators to coordinate their efforts to regulate SCs in a more consistent manner.

RELEVANT QUOTES

By a Professional Services Provider

"Accounting for digital assets is messy because the terms of the coins are different (i.e. not standardised). (The industry is) not sure which accounting model should be pushed for certain tokens"

By a Supranational Organisation

"It is important to note the legality of electronic transactions and smart contracts, determining who should be taking up responsibility for legal disputes"

Interviewees acknowledged the presence of gaps in the present regulatory regime, emphasising the importance of – and the urgent need for – further clarity around legal taxonomies and responsibilities, as well as regulatory harmonisation across jurisdictions

Industry Response

Aggregate View

LEGAL TAXONOMY

If regulators provide a clear definition of instruments, such as stablecoins as a medium of exchange, it could facilitate greater adoption of stablecoins and drive further evolution of the industry.

The accounting of digital assets can be challenging due to the lack of standardisation, which makes it difficult to determine the appropriate accounting model for certain tokens.

LEGAL RESPONSIBILITY

It is essential to consider the legality of electronic transactions and smart contracts and to determine the responsible party for addressing legal disputes.

The legality of these digital assets remains highly uncertain in many jurisdictions, which poses challenges for businesses looking to facilitate their adoption.

REGULATORY COORDINATION

There is limited alignment between countries in terms of regulations pertaining to SCs. The same is true for CBDCs and DTs which are more recent developments.

Fragmented and inconsistent regulations across different jurisdictions may encourage some market participants to engage in regulatory arbitrage.

Continued regulatory cooperation and coordination is needed to ensure a certain level of interoperability to support cross-jurisdictional wholesale adoption.

Source: Interviews, Quinlan & Associates analysis

NEW REGULATORY DEVELOPMENT

KEY OBSERVATIONS

Regulators around the world are actively working to devise or revise regulatory frameworks for SCs - evident by recent developments, such as Hong Kong's publication of a consultation paper on stablecoins, as well as Japan's plan to lift the ban on foreign stablecoins.

However, there are still areas of uncertainty that require further clarity, particularly around the legal taxonomy of SCs in various jurisdictions, even as reserve requirements for SCs are generally well-established in most jurisdictions.

RELEVANT QUOTES

By an Academic Institution

"A liability framework needs to be put in place for customer protection, liability for loss, etc."








By a Banking Institution

"Regulations don't dictate the use of technology, as long as compliance checks are in place."

By a Payment Company

"Most regulators are taking a similar approach in being pro-consultation, taking into account the private sector's opinion."

While there are established regulatory frameworks in place for CBDCs and DTs, SCs are a relatively new area of focus, with governments around the world actively investigating ways to establish appropriate regulatory frameworks for SCs

Jurisdiction	Description	Consultation Papers & Projects
	In a recent release of the conclusion to a discussion paper, Hong Kong highlighted its regulatory stance on SCs (e.g. aiming for an activity-based approach, allowing non-authorised institutions to issue), with even greater clarity anticipated later this year	<ul style="list-style-type: none">• Conclusion of Discussion Paper on Crypto-assets & Stablecoins (2023)
	While a regulatory framework for SCs is still in the consultation phase, Singapore has clearly mapped out regulations in a detailed manner	<ul style="list-style-type: none">• Consultation Paper on Proposed Regulatory Approach for Stablecoin-Related Activities (2022)
	Japan's regulations on domestic SCs ¹ and foreign SCs are now comprehensive. Amendments to the Payment Services Act and other statutes were passed in 2022 for purposes of introducing a new regulatory framework for SCs, which came into effect on June 1, 2023 with respect to the relevant regulations, public notices, and guidelines.	<ul style="list-style-type: none">• Amended Payment Service Act (Passed: 2022, Effective: 2023)
	While there is currently no comprehensive nationwide ² regulatory framework for SCs in the U.S., federal lawmakers have been introducing various bills to Congress. Uncertainties remain with respect to whether SCs should be regulated as securities under the current federal securities regulatory regime ³ or regulated as virtual currencies pursuant to a tailor-made new regulatory regime for digital assets.	<ul style="list-style-type: none">• SEC's potential investigation on Binance USD (2023)• NY DFS' Virtual Currency Guidance (2023)• Stablecoin Trust Act (2022-)
	The U.K. has been proactive in its efforts to establish clearer regulations for digital assets, specifically stablecoins. These efforts include making significant progress both through amending existing e-money and payment legislation, recent consultations, and the introduction of the Financial Services and Markets Bill 2022 which, if adopted, will further amend the existing financial services regime.	<ul style="list-style-type: none">• Future Regulatory Regime for Cryptoassets (2023)⁴• Financial Services and Markets Bill 2022 (Not yet adopted)
	The European Union has clearly stated its support for the development of Euro-backed SCs, as outlined in MiCA - one of the most comprehensive sets of regulations expected to be enforced this year - alongside other initiatives	<ul style="list-style-type: none">• Markets in Crypto-assets ("MiCA") Regulations (2022-)
	In the absence of a specific regulation in relation to SCs in the UAE, the classification of SCs under the legislation depends on the structure and intended use of the SC. In a recent guidance issued by the Abu Dhabi Global Market ("ADGM") ⁵ on virtual assets, SC is described as a blockchain-based token that is valued by reference to an underlying fiat currency or basket of assets.	<ul style="list-style-type: none">• Stablecoin Regulations for Payments (2023-)• Virtual Asset Issuance Rulebook (2023)

¹SCs are categorised as Electronic payment instruments ("EPIs"), which comprise of (a) payment instruments, (b) prepaid payment instruments, (c) securities [including trust beneficial interests] and (d) crypto-assets; ²On the state level, several states, including New York, Texas, and Nebraska, promulgated their own regulations and / or guidance on SCs. In the absence of dedicated national regulations and clear regulatory landscape, stablecoin issuers have relied on state-based money transmission licenses; ³regulated in a way akin to bank regulation; ⁴three-month consultation ended in April with the UK government's response expected shortly; ⁵According to the ADGM guide, the Financial Services Regulatory Authority position in relation to stablecoins is as follows: (a) permit only those stablecoins which constitute a fully backed 1:1 fiat token backed only by the same fiat currency it purports to be tokenising, (b) fiat tokens are to be treated as a mechanism for storing value (e.g. e-money), and (c) issuers of fiat tokens for the purposes of facilitating or effecting payments are treated as money services businesses. KWM expect the onshore regulatory position to follow the same position described above. In this case, SCs would fall under the licensable activities of the UAE Central Bank and not the Virtual Assets Regulatory Authority ("VARA") or the Securities and Commodities Authority ("SCA").

Source: KWM (Hong Kong, New York, and London), Allen & Gledhill (Singapore), Nishimura & Asahi (Tokyo), Al Tamimi & Company (Dubai), Interviews, Quinlan & Associates analysis

STABLECOIN REGULATIONS (1/2)

KEY OBSERVATIONS








While CBDCs and DTs stand to benefit from clear and established banking regulations, SCs are a new instrument that may necessitate new regulations.

Regulators around the world have been actively establishing regulatory frameworks. Despite their efforts, there are still notable discrepancies with respect to regulations governing SCs, particularly on aspects such as legal taxonomy and licensing requirements.

SCs are facing different legal taxonomies, licensing requirements, and business limitations across jurisdictions

Stablecoin Regulatory Framework

Key Jurisdictions

	 Hong Kong	 Singapore	 Japan ⁴	 U.S.	 U.K.	 EU	 UAE ⁷
Regulation in place	✓ ¹	✗	✓	✗	✗	✗	✗
Relevant Licenses	Dependent on legal structure of the SC	SPI* / MPI** License	Type II / III FTSP*** under the PSA**** / Banking license	MTL***** / Charter under state banking laws	E-money / Payment Institution License	Electronic Money Institution License / MiCA License	Onshore VARA (Dubai) / Onshore SCA (Federal) / DIFC***** / ADGM.
Legal Taxonomy							
Virtual Asset	✓	✓	-	✓	✓	✓	✓
Security	-	✗	✗	✓	✗	✗	✗
Stored Value Facility	-	✗	✗	✗	✗	✓	✓
Liability	✓	✗	✓	✗	✓	✗	✗
Money	✗	✗	✗	✗	✗	✗	✗
Licensing Requirement							
E-Money / SVF* License	- ²	✗	✓	- ⁵	✓	✓ ⁶	✓
Payment License	✗	✓	✓	- ⁵	✓	✗	✓
SC-specific License	✗ ³	✗	✗	- ⁵	-	✓ ³	✓
Circulation / Volume Limitation							
On Domestic SCs	✗ ³	✗	✓	✗	✗	✗	✗
On Non-domestic SCs	✗ ³	✗	-	✗	✗	✓	✗

✓ Applicable - Dependent ✗ Not Applicable

¹AMLO VA exchange licence likely for exchanges; some remains unregulated; ²Subject to greater clarity in 2024; ³E-Money Licensees are expected to acquire stablecoin-specific license to issue stablecoin; ⁴The table is only applicable to type II / III FTSP registrations that issues (a) payment instruments and (b) prepaid payment instruments classified as EPIs; ⁵Dependent on state-level requirements; ⁶In discussion to set up a single licensing regime across the EU; ⁷The table below only feature VARA (Dubai). UAE Central Bank may issue relevant license, which will become clear when relevant regulations are issued in relation to the treatment of SCs. *Stored Value Facilities; **Standard Payment Institution; ***Major Payment Institution; ****Fund Transfer Service Providers; *****Payment Services Act; *****Money Transmission License; *****Dubai International Financial Centre. Source: KWM (Hong Kong, New York, and London), Allen & Gledhill (Singapore), Nishimura & Asahi (Tokyo), Al Tamimi & Company (Dubai), Quinlan & Associates analysis

STABLECOIN REGULATIONS (2/2)

KEY OBSERVATIONS








On top of the previous aspects, disclosure requirements in the U.K., Hong Kong, and Japan remain unclear regarding SCs.

However, reserve requirements are clearly established in most jurisdictions, with SCs being fully backed by cash / cash-equivalents to comply with local regulations.

While SC reserve requirements are generally consistent across multiple jurisdictions, the majority of these jurisdictions have not consistently outlined specific disclosure requirements on SCs

Stablecoin Regulatory Framework

Key Jurisdictions

							
Reserve Requirements	Hong Kong	Singapore ²	Japan	US ⁶	U.K.	EU	UAE
Minimum Ratio (Reserve : Outstanding)	1:1	1:1	1:1	1:1	1:1	1:1	1:1
Currency	Same as Pegged Currency	Same as Pegged Currency ³	Same as Pegged Currency	Same as Pegged Currency	Same as Pegged Currency	Same as Pegged Currency	N/A
Asset Type	Cash / cash equivalents	Cash / cash equivalents / short-dated sovereign debt securities	Cash / cash equivalents / Security deposits of cash of bonds with an official guarantee	Cash / cash equivalents / level 1 high-quality liquid assets ⁷	N/A	Partly Deposits	N/A
Custodian institution	N/A	Licensed banks, merchant banks, finance companies / capital market services licensees	Japanese government / Deposit taking institutions	U.S. state / federally-chartered depository institutions or asset custodians	Authorised credit institution / custodian	Credit institutions, regulated investment firms, or Coordinated Activities on the Safety of Products ("CASP")	N/A

Disclosure Requirements

Underlying Assets Value	✗ ¹	✓ ⁴	✓	✓	✗	✓	✓
Reserve Composition	✗ ¹	✓ ⁴	✓	✓	✗	✓	✓
Rights of Holders	✗ ¹	✓	✓	✗	✗	✓	✓
Redemption Policies	✗ ¹	✓	✓	✓	✗	✗	✗
Conflict of Interest	✗ ¹	✗	✓	✗	✗	✓	✓
Amount in Circulation	✗ ¹	✗	✓ ⁵	- ⁸	✓	✓	✗

✓ Applicable
 - Dependent
 ✗ Not Applicable

¹Subject to greater clarity in 2024; ²As proposed in the Consultation Paper on Proposed Regulatory Approach for Stablecoin-Related Activities (2022); ³Linked to only a single fiat currency - either SGD or one of the G10 currencies; ⁴This assumes that this information will be covered in the proposed monthly disclosure (independently attested) and yearly audit of reserve assets; ⁵Typically required to explain the total issued amount and the maximum issuable amount (if any); ⁶This is state-specific (New York) and included as an example of regulatory frameworks of a state in the U.S., as there is currently no federal regulations on stablecoins; ⁷Examples include U.S. Treasury bills acquired by the Issuer three months or less from their respective maturities, reverse repurchase agreements fully collateralised by U.S. Treasury bills, U.S. Treasury notes, and / or U.S. Treasury bonds on an overnight basis, government money-market funds, and deposit accounts at U.S. state or federally chartered depository institutions; ⁸May be a component of the attestations by a registered accountant.

Source: KWM (Hong Kong, New York, and London), Allen & Gledhill (Singapore), Nishimura & Asahi (Tokyo), Al Tamimi & Company (Dubai), Quinlan & Associates analysis

REGULATORY HARMONISATION

KEY OBSERVATIONS

One major hurdle that must be overcome to realise benefits like atomic settlement is the discrepancy in legal standards on the finality of settlement across jurisdictions. Finality of settlement is primarily a legal issue that must be handled by clarity in law or regulation.

RELEVANT QUOTES

By an Academic Institution
"Finality of settlement is not a capability of the commercial / central banks, but it is a legal issue as it is recognised differently by different jurisdictions, which disrupts mass adoption."

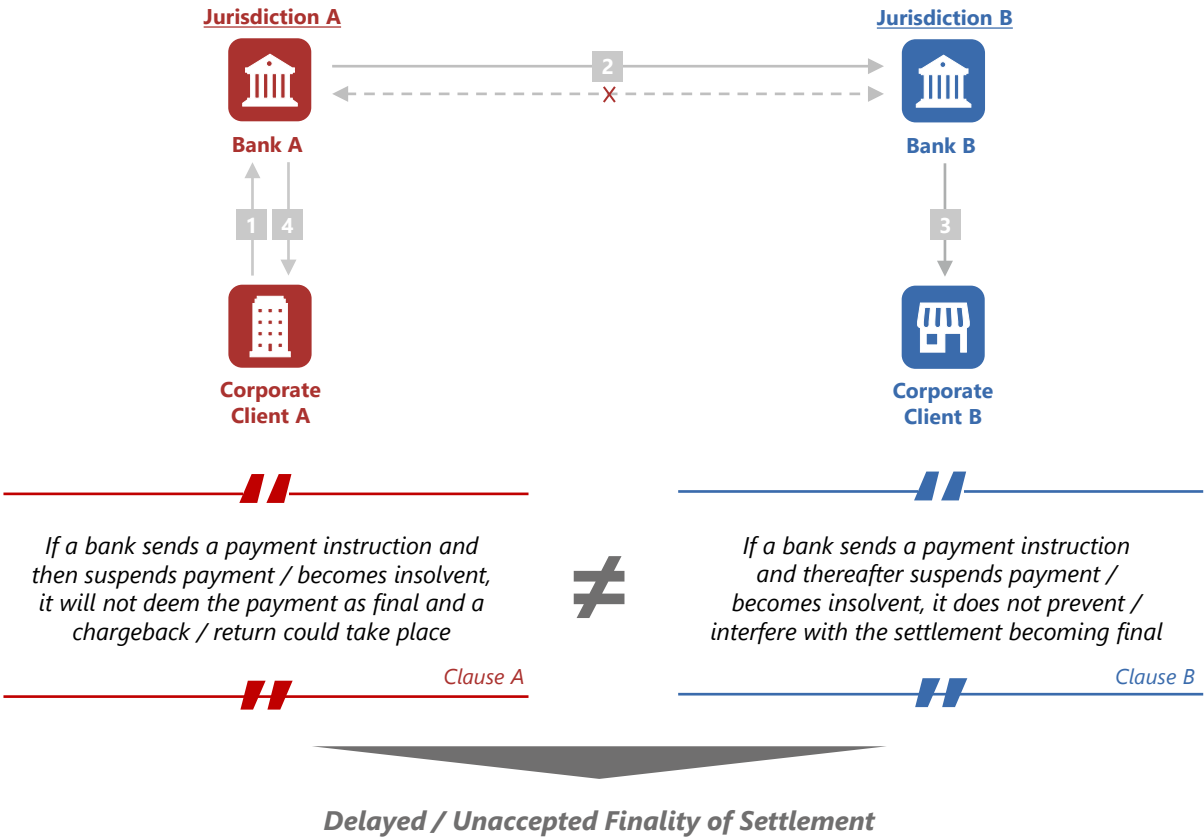
By a Banking Institution
"Technology cannot overcome legal and regulatory issues associated with finality of settlement as some currencies may not recognise finality, while others may not be accepted by one jurisdiction due to the perceived lack of finality."

By a Payment Company
"The world lacks a global settlement layer that can achieve legally certain settlement finality, where transaction may not be unwound through insolvency proceedings."

Another notable regulatory challenge is the difference in the legal definition of settlement finality, which affects atomic, cross-border settlement through fiat-backed tokens in case of payment revocation / insolvency issues

Finality of Settlement

Cross-border Transaction



Source: HKMA, Reserve Bank of Australia, Interviews, Quinlan & Associates analysis

SECTION 6

LOOKING AHEAD



SUMMARY OF KEY FINDINGS

KEY OBSERVATIONS

- CBDCs:** Conceptually, given that CBDCs are M0, while DTs and SCs are M1, DTs and SCs carry higher counterparty risk.
- Stablecoins:** Due to unclear legal taxonomies and responsibilities across jurisdictions (coupled with recent risk events), banking institutions and payment companies remain more hesitant to proactively explore stablecoins for their operations, although digital assets players remain open to further explore their use.
- DTs:** While banking institutions may prefer DTs for liquidity and intraday float benefits, the appropriate use and legal taxonomy of deposit tokens in the context of wholesale financial markets is still being investigated.

It is likely that these three assets will continue to evolve in tandem, with new adoption explorations and use cases emerging in the coming years.

Given that CBDCs are M0, while DTs and SCs are M1, DTs and SCs carry higher counterparty risk

	CBDCs	Stablecoins	Deposit Tokens
Issuer	Central Bank	Commercial Banks & NBFIs	Commercial Banks
Structure			
Money Type	M0	M1	M1
Equivalent Asset	Liability	Liability	Liability
	Fiat Cash	Fiat Representation	Bank Liabilities / Debt securities
Characteristics			
1:1 Backing	✓ (Backed by Central Bank)	✓ (Likely)	✗ (Unlikely)
Liquidity	✗ (Central Bank Liquidity)	✗ (Locked)	✓ (Unlocked)
Intraday Float	✗ (Unavailable)	✗ (Unavailable)	✓ (Available)
Atomic Settlement	✓ (Likely)	✓ (Likely)	- (Dependent)
Wholesale Use Case			
Payment-versus-Payment	✓ (Applicable)	✓ (Applicable)	✓ (Applicable)
Delivery-versus-Payment	✓ (Applicable)	✓ (Applicable)	- (Dependent)
Regulation			
Subject to Reg. Compliance	✓ (Existing regulations applied)	✓ (Existing regulations applied)	✓ (Existing regulations applied)
Regulatory Clarity	✓ (Existing regulation applied)	✗ (Further development needed)	- (Clarification needed)
Observed Preference			
Banking Institutions	Low ●————● High	Low ●————● High	Low ●————● High
Payment Companies	Low ●————● High	Low ●————● High	Low ●————● High
Digital Assets Player	Low ●————● High	Low ●————● High	Low ●————● High
Stablecoin Issuers	Low ●————● High	Low ●————● High	Low ●————● High

● Current Level of Preference (Based on the interviews)
✓ Applicable
- Dependent
✗ Not Applicable

Source: Interviews, Quinlan & Associates analysis

THE WAY FORWARD

KEY OBSERVATIONS

- **Market Facilitators:**

To foster wholesale adoption of emerging digital currencies, cross-jurisdictional cooperation and coordination efforts remain essential, as it addresses discrepancies in legal definitions and responsibilities across jurisdictions. It will enable sustained progress for market participants and boost the competitiveness of jurisdictions aiming to become modern financial hubs.

- **Market Stakeholders:**

Growing interest in CBDCs, DTs, and SCs among banking and non-banking institutions indicates considerable the potential of this emerging asset class. Institutions should continue to pay close attention to potential interoperability solutions, which will help to unlock the full potential of this asset class in the future.

Similar to any other technology-driven innovations, the advancements in wholesale financial operations through the adoption of CBDCs, DTs, and SCs are in their nascent stages; hence, it will require extensive coordination by market facilitators and exploration by stakeholders



Market Facilitators

(IGOs, Regulators, Policy Makers, etc.)

- Regulatory bodies have been actively publishing consultation papers that outline their approach to digital assets.
- However, notable discrepancies in terms of legal taxonomies, definitions and responsibilities persist across jurisdictions, particularly with respect to SCs.
- Regulatory coordination remains critical, enabling more responsible and sustainable progress by market participants while enhancing the competitiveness of jurisdictions seeking to establish themselves as new-age financial hubs.



Market Stakeholders

(Banking Institutions, NBFIs, Industry Players, etc.)

- We have observed a growing interest in the adoption of CBDCs, DTs, and SCs by major banking and non-banking institutions across various jurisdictions.
- We recognise that both technology and regulation are in their early stages of development, which may lead to siloed initiatives within individual "walled gardens".
- Despite industry convergence challenges, it is important for institutions to keep a close eye on emerging interoperability solutions that are being developed, given their ability to unlock the full potential of this new asset class.

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We would like to thank the following colleagues at the Bank for International Settlements for their valuable feedback on this publication:

- Leonardo Gambacorta, Head of Innovation and Digital Economy, Monetary and Economic Department
- Rodney Garratt, Senior Advisor, Financial Stability Policy, Monetary and Economic Department
- Anneke Kosse, Senior Economist, Committee on Payments and Infrastructures, Monetary and Economic Department
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- Tirupam Goel, Economist, Hong Kong Economics, Monetary and Economic Department
- Morten Bech, Head of Swiss Centre, BIS Innovation Hub
- Mike Alonso, Advisor, Swiss Centre, BIS Innovation Hub

We would also like to acknowledge the team at King & Wood Mallesons (Hong Kong, New York, and London), Allen & Gledhill (Singapore), Nishimura & Asahi (Tokyo), and Al Tamimi & Company (Dubai), for their legal input on the *Regulatory Perspectives* section of this report.

Quinlan & Associates

- Benjamin Quinlan, CEO & Managing Partner
- Justin Chung, Engagement Manager
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Project supported by:
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