Reshaping Capital Markets through Digitalization and Technology Adoption

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The Digital Paradox: Why Blockchain When Bonds Are Already Digital?

Traditional capital markets are structurally fragmented by design. Issuance, registration, custody, settlement, and post-issuance reporting are performed by different institutions, operating on separate systems and maintaining independent ledgers.

The Fragmentation Problem

Markets rely on repeated reconciliation across multiple systems. Settlement typically occurs on a T+2 basis, causing delays and counterparty risk. Operational processes are costly and prone to errors.

Historical Origins

These frictions are not accidental—they are the outcome of historical institutional design that evolved over decades to manage trust and verification in a pre-digital era.

Economic Framework

From transaction cost economics, bond markets operate with high coordination and verification costs. Trust is enforced not by perfect information, but by layers of intermediaries.

The DLT Solution: Infrastructure Redesign

DLT enables shared or synchronized ledgers where ownership records, transaction status, and settlement information are updated simultaneously for authorized participants.

The Economic Value

This reduces transaction and verification costs across the entire value chain.
It represents an evolution in governance structure—not disintermediation, but reconfiguration of intermediation.
The economic value of DLT lies not in tokenization itself, but in infrastructure redesign that reduces friction and enables real-time coordination.

CASE EVIDENCE

Primary Markets: Redesigning Issuance and Registration

Category	**World Bank × SDX Digital Bond**	**HKSAR Digital Green Bonds (2023–2025)**
Issuance Period	2022–2023 (pilot issuance)	2023–2025 (multi-tranche programme)
Issuance Size	CHF 200 million	~HKD 100bn (cumulative)
Currency	CHF	HKD, RMB, USD, EUR
Bond Type	SSA digital bond	Sovereign digital green bond
Role of DLT	Issuance, registration, safekeeping	Issuance & lifecycle records
Settlement Infrastructure	SDX (regulated digital FMI)	Central Moneymarkets Unit (CMU) + DLT platform
Settlement Design	Near real-time, hybrid model	Near real-time, hybrid model
Legal Settlement Finality	Swiss law via SDX	Anchored in CMU under Hong Kong law
Data & Disclosure Standards	Conventional bond documentation	ICMA Bond Data Taxonomy (BDT)
Identifiers	ISIN	ISIN + ISO 24165 Digital Token Identifier
Role of CSD / Custodian	SDX acts as digital CSD	CMU retained as trust anchor

World Bank × SIX Digital Exchange

The World Bank, together with SIX Digital Exchange (SDX), issued a digital bond where issuance, registration, and safekeeping were integrated within a single DLT-based infrastructure, eliminating redundant processes.

Hong Kong SAR Digital Green Bonds

Between 2023 and 2025, the Hong Kong SAR Government, supported by the Hong Kong Monetary Authority, issued digital green bonds using a hybrid architecture: on-chain records for efficiency combined with the existing Central Moneymarkets Unit for legal settlement finality.

What matters is not the use of tokens itself, but the integration of issuance, registration, and lifecycle management into a single data flow that eliminates reconciliation friction.

CASE EVIDENCE

Post-Trade and Settlement: Redefining Delivery-versus-Payment

Category	**Eurosystem DLT Settlement Experiments (2024)**	**JPMorgan Onyx (Repo & Collateral)**
Project Type	Central bank–led market-wide experiment	Bank-led production-scale platform
Scope of Assets	DLT-based securities transactions	Repo and collateralised transactions
Project Stage	Large-scale live testing (2024)	Live, ongoing institutional use
Currency	EUR	USD
Role of DLT	Execution of securities leg on DLT	Settlement of cash & collateral on DLT
Settlement Asset (Cash Leg)	Central bank money (experimental wholesale CBDC-like arrangements)	JPM Coin (tokenised commercial bank money)
Settlement Infrastructure	DLT platforms linked to TARGET services	Onyx blockchain infrastructure
DvP Design	Atomic DvP (experimental)	Near real-time DvP for repo
Legal Settlement Finality	Central bank settlement finality	Contractual finality within JPM network
Main Constraint Addressed	System-level settlement risk and scalability	Intraday funding and liquidity efficiency

ECB and Eurosystem DLT Experiments

In 2024, the European Central Bank and Eurosystem conducted large-scale experiments linking DLT-based securities transactions with central bank settlement systems, demonstrating feasibility at institutional scale.

JPMorgan Onyx Platform

JPMorgan Chase used JPM Coin through its Onyx platform to settle repo transactions almost in real time, significantly improving collateral mobility and intraday liquidity management for institutional clients.

The main bottleneck is not the bond token—it is the cash leg of settlement. Without settlement assets that have legal finality on or connected to the ledger—whether wholesale CBDC, tokenized deposits, or stable tokens—true delivery-versus-payment cannot be achieved.

CASE EVIDENCE

Data Standards and Market Governance

Category	ICMA BDT (Hong Kong Digital Green Bonds)	MAS Project Guardian (Fixed Income Stream)
Project Type	Market data & disclosure standard	Regulatory co-design pilot
Applied Market	HKSAR sovereign digital green bonds	Tokenized bond market (conceptual & pilot)
Primary Focus	Issuance, disclosure, post-issuance reporting data	Contract design, risk disclosure, governance
Role of Standards	Define a common, machine-readable bond data language	Define principles for scalable market design
Key Standard / Framework	ICMA Bond Data Taxonomy (BDT)	Project Guardian policy & design frameworks
Identifiers	ISIN + ISO 24165 Digital Token Identifier (DTI)	Explores compatibility with ISIN / DTI
Role of DLT	Enable structured, end-to-end data pipelines	Enable testing of governance-ready DLT use cases
Role of Intermediaries	Preserved implicitly through standard compliance	Explicitly preserved as trust anchors
Regulatory Approach	Market-led standard setting	**Regulator as co-designer**
Main Market Failure Addressed	Data fragmentation and reporting inefficiency	Governance uncertainty and legal risk
Scalability Mechanism	Interoperability via shared data language	Institutional alignment before scale

Data and Disclosure Standards

In Hong Kong's digital green bond issuance, ICMA's Bond Data Taxonomy was embedded directly into issuance and reporting processes. ISO introduced the Digital Token Identifier (ISO 24165), linking tokens to ISINs and LEIs.

Interoperability is not about which blockchain is used—it is about whether markets share common data languages and identifiers.

Market Infrastructure and Governance

The Monetary Authority of Singapore's Project Guardian illustrates a different regulatory philosophy: regulators participating at the design stage of tokenized bond markets, co-creating frameworks with industry.

DLT does not eliminate central securities depositories or custodians. It repositions them as trust anchors and network hubs within a new architecture.

Why Adoption Is Slower Than Expected

If the technology works, institutions are on board, and pilots are successful—why is adoption still slower than many expected? The reasons are **institutional,** not technological.

The Cash-Leg Problem

The settlement asset challenge remains unresolved at scale. Multiple solutions are being tested—wholesale CBDC, tokenized deposits, stable coins—but no dominant standard has emerged, creating fragmentation and hesitation.

Legal Uncertainty

Legal finality is still jurisdiction-specific, especially for cross-border transactions. This creates regulatory risk and limited scalability. It is fundamentally a legal and regulatory challenge, not a technological problem.

Limited Interoperability

Many projects remain confined within single platforms or financial groups, preventing network effects. Without interoperability, each system becomes an island rather than part of a connected ecosystem.

Misaligned Incentives

For incumbent intermediaries, DLT may reduce fee revenue before efficiency gains materialize. This creates a coordination problem where individual actors have limited incentive to move first.

What Needs to Happen Next: ABMI (DBMF) Perspective

Moving from National Pilots to Regional Connectivity

The next phase of digital capital market development in Asia must move beyond isolated national pilots toward **regionally coordinated interoperability.**
In this transition, the Digital Bond Market Forum (DBMF) under the Asian Bond Markets Initiative (ABMI) can play a catalytic role by addressing three concrete institutional priorities.

01

Standards as Regional Public Goods

Coordinate regional adoption of common data taxonomies, identifiers (ISIN, LEI, DTI), and basic smart contract templates.

Treat standards as shared infrastructure, not platform-specific solutions.

02

Connect Institutions, Not Just Chains

Prioritize alignment among CSDs, payment systems, and legal finality regimes.

Interoperability should be built at the institutional layer, not at the blockchain layer.

03

Regulatory Co-Design

Embed regulators early in market-led pilots to ensure legal certainty by design.

Reduce ex-post regulatory risk and coordination failures.

What Needs to Happen Next: ABMI (DBMF) Perspective

From Pilots to Scale
Many successful POCs exist, but remain siloed
Local efficiency without regional connectivity

What's Next
Shift from national pilots to **regional interoperability**
DBMF (under ABMI) as a catalyst

Why It Matters
No connectivity, no scale

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The Future of Digital Capital Markets in Asia

Fragmentation (Current State)

National Silos, Trapped Liquidity

- Separate issuance platforms
- Isolated CSDs and payment systems
- Jurisdiction-specific legal finality
- Incompatible data and reporting standards

Result:

- Liquidity confined within borders
- High reconciliation and settlement costs
- Limited asset mobility
- Digitally enabled, but structurally fragmented

Connectivity (Transition Phase)

Institutional & Data Interoperability

- Common standards as regional public goods
- Institution-to-institution connectivity (CSDs, payment systems, regulators)
- Hybrid architectures (DLT + existing legal finality)

Mechanism:

- Lower coordination and verification costs
- Assets become portable across jurisdictions

Liquidity (End State)

A Regionally Integrated Liquidity Network

- Cross-border circulation of digital bonds
- Deeper, pooled regional liquidity
- Lower transaction & settlement costs
- Broader investor participation

Outcome:

- Digital technology becomes invisible infrastructure
- Liquidity emerges as a consequence of connectivity

Asia's digital capital markets will not be defined by how fast technology is adopted, but by how deeply markets are connected — and liquidity will follow.

Thank You