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Cross-Border Payments Margin Reset: Regulatory Arbitrage Under CBDC Pilots

This strategic policy report delves into how CBDC pilots are redefining cross-border payment margins and regulatory control, while also impacting geopolitical leverage in a fragmented global landscape. It is designed for policymakers, regulators, and central banks to understand the evolving financial order and explore strategic opportunities and constraints.

Published by: Damodara Rao Repalle, Ghost Research

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Executive Summary

Central Bank Digital Currencies (CBDCs) and tokenization are transforming cross-border payments by shifting value capture from traditional banking intermediaries to protocol-level functions like atomic settlement, embedded compliance, and programmable liquidity, amid geopolitical fragmentation that elevates payment autonomy as statecraft. Legacy systems rely on multilayered correspondent networks, SWIFT messaging, and trapped liquidity, generating high margins from compliance, FX spreads, and operational inefficiencies, but face constraints in speed and transparency. CBDC pilots such as Project Mariana, digital euro, e-Rupee, e-Dirham, and mBridge introduce near-real-time PvP settlement, shared ledgers, and sovereign control, compressing traditional margins while creating new ones in interoperability, governance, and compliance attestations. Regulatory arbitrage risks emerge from interoperability gaps, including perimeter hopping, tier access differences, data inconsistencies, and geopolitical bloc alignments, necessitating coordinated standards to prevent evasion. By 2030, scenarios foresee multilateral networks, geoeconomic blocs, or hybrid CBDC-stablecoin systems, with margins shifting to governance, identity, and liquidity access. Governments must treat CBDC deployment as market structure reform, mandating issuance guidelines, licensing for connectors, ISO 20022 harmonization, and defensive architectures against arbitrage, balancing international coordination with sovereignty. Strategic recommendations urge immediate multilateral pilots, medium-term margin oversight and protocols, and long-term geopolitical positioning through public-private partnerships, monitoring frameworks, and capture of new margin layers to meet G20 targets for cheaper, faster payments by 2027.

1. Executive Framing: Why This Matters Now

Cross border payments are entering a margin reset driven less by incremental modernization and more by the emergence of programmable sovereign money rails. CBDC pilots and adjacent tokenisation projects are shifting where value is captured in international payments, from bank balance sheet intermediation and correspondent networks toward protocol level functions such as atomic settlement, embedded compliance, and programmable liquidity. At the same time, geopolitical fragmentation and sanctions risk are increasing the strategic premium on payment autonomy, making cross border payment design a tool of statecraft rather than a purely technical upgrade.

For governments and central banks, the near term policy challenge is not simply whether CBDCs reduce costs. It is whether new rails reallocate margin and control to foreign platforms, domestic incumbents, or state operated infrastructures, and whether interoperability becomes a channel for regulatory arbitrage or a mechanism for coordinated oversight. The strategic urgency is amplified by concrete milestones in Europe, the Gulf, and China linked corridors, and by global targets for faster and cheaper cross border payments that create political pressure to deliver measurable improvements by 2027.

1.1. Core thesis: CBDC pilots reshaping cross-border payment economics, regulatory dynamics, and geopolitical positioning

CBDC pilots are not only testing new settlement technology. They are testing a new allocation of economic rents and regulatory power in cross border payments.

Key mechanisms reshaping payment economics

- Margin relocation from intermediaries to infrastructure: CBDC and tokenised settlement designs can move value capture away from correspondent banking spreads and operational float toward platform access fees, wallet and gateway services, liquidity provisioning on new rails, and compliance as a service embedded in transaction logic.

- Atomic settlement and reduced counterparty risk: Tokenised wholesale settlement concepts explicitly target synchronous, final settlement across currencies and instruments, reducing the need for layered guarantees and reconciliation that historically justified higher margins in cross border flows [1].
- Protocol level compliance and data control: CBDC architectures can embed identity, policy rules, and reporting hooks at the rail level, shifting compliance cost curves and changing who can intermediate cross border flows.

Regulatory dynamics are shifting from institution supervision to rail governance

- Rule setting moves closer to the ledger: In CBDC and unified ledger models, policy choices about access, privacy, limits, and conditionality can be implemented as technical standards and operating rules, not only as ex post supervision.
- Interoperability becomes a regulatory perimeter: Cross border linkages between domestic instant payment systems and CBDC systems create new seams where regulatory requirements can diverge, and where arbitrage can occur through routing, wallet tiering, or jurisdiction shopping.

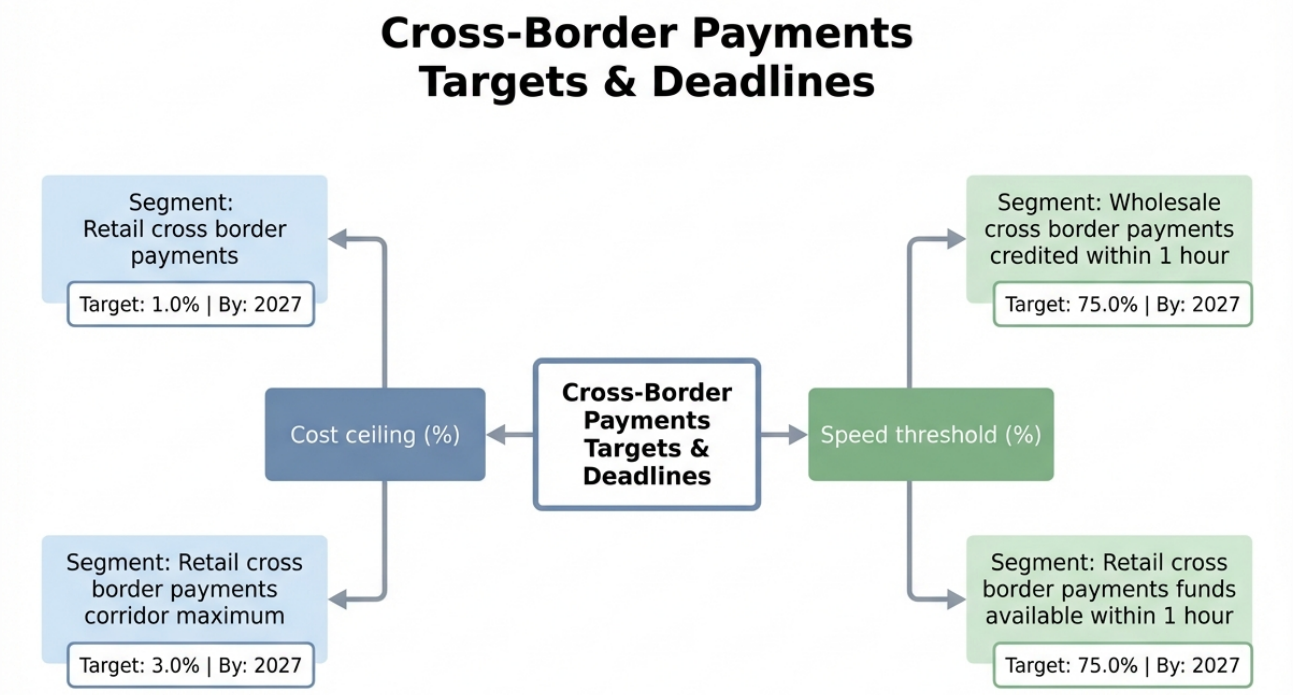
Geopolitical positioning is increasingly tied to payment rail optionality

- Payment autonomy as strategic resilience: The expansion of alternative cross border settlement channels, including CBDC corridors and non SWIFT aligned infrastructures, is accelerating in response to sanctions risk and geopolitical uncertainty.
- CBDC pilots as influence infrastructure: Early movers can shape technical standards, governance models, and corridor economics, influencing which jurisdictions become liquidity hubs and which become price takers.

Title: Selected quantitative targets and benchmarks shaping urgency

Metric	Segment	Target value	Target date
Cost ceiling (%)	Retail cross border payments	1.0%	2027
Cost ceiling (%)	Retail cross border payments corridor maximum	3.0%	2027
Speed threshold (%)	Wholesale cross border payments credited within 1 hour	75.0%	2027

Metric	Segment	Target value	Target date
Speed threshold (%)	Retail cross border payments funds available within 1 hour	75.0%	2027



Source: G20 Targets for Enhancing Cross border Payments, Financial Stability Board [2].

Country examples illustrating the thesis:

- European Union: The digital euro program is explicitly framed as supporting monetary sovereignty and reducing dependence on non European payment providers, linking payment economics to strategic autonomy [3].
- United Arab Emirates: The central bank positions multi CBDC infrastructure such as mBridge as a way to reduce cross border frictions and improve speed, supporting the UAE ambition to be a regional clearing and trade hub [4].

- China and Hong Kong: Cross boundary e CNY expansion in Hong Kong links a domestic faster payment system with a CBDC system, demonstrating how CBDC corridors can be built around existing retail rails and regional economic integration goals [5].

1.2. Contemporary geopolitical-financial context and its influence on payment systems

Cross border payment infrastructure is being redesigned under three reinforcing pressures.

Geopolitical fragmentation and sanctions risk are raising the value of payment optionality

- The post 2022 sanctions environment has increased incentives for some jurisdictions and firms to diversify settlement channels and reduce single point dependencies, accelerating interest in alternative rails and regional corridors.
- This does not require a full replacement of SWIFT messaging to matter. Even partial migration of high value corridors to tokenised settlement platforms can shift liquidity patterns and bargaining power.

Industrial policy is converging with payment policy

- Payment rails are increasingly treated as strategic infrastructure similar to telecoms or cloud, where control over standards, data, and access can translate into competitive advantage.
- Europe has publicly linked the digital euro to competitiveness, resilience, and inclusion, and to reducing reliance on large non European payment providers [6].

Private digital money growth is forcing sovereign responses

- Central banks report that stablecoin and cryptoasset developments have accelerated CBDC work in a significant share of jurisdictions, indicating that CBDC pilots are partly a defensive response to private money scaling across borders [7].

Domestic political constraints are shaping cross border strategy

- United States: Legislative activity to restrict or prohibit a Federal Reserve CBDC reflects a political constraint that may push the US toward alternative approaches such as regulated private stablecoins and tokenised deposit models for cross border modernization, rather than a retail CBDC path [8].

Why this context accelerates CBDC urgency

- Fragmentation increases the premium on controllable settlement: When geopolitical alignment is uncertain, states value rails where access rules, data sharing, and compliance enforcement are under sovereign or allied governance.
- Competition shifts from price to governance: The key differentiator becomes not only cost and speed, but also whose rules apply, whose data is visible, and whose institutions can be excluded or prioritized.

1.3. Recent milestones in CBDC development accelerating strategic urgency (e.g., Project Mariana, digital euro, UAE pilot)

Several milestones since 2023 have moved CBDC discussions from concept to operational planning, increasing the urgency for governments to define positions on interoperability, governance, and margin capture.

Project Mariana and the tokenised FX settlement agenda

- The BIS Innovation Hub and partner central banks published Project Mariana as a proof of concept exploring cross border exchange of wholesale CBDCs using automated market makers, explicitly targeting FX trading and settlement design in a CBDC world [9].
- The report frames FX as a core locus of cross border margin and liquidity, highlighting that CBDC era margin compression will be contested most intensely where FX conversion and settlement risk are priced.

Digital euro timeline has become more concrete

- The ECB announced in October 2025 that the Eurosystem moved to the next phase of the digital euro project after concluding the preparation phase that began in November 2023 [10].

- The ECB stated an assumption that if legislation is adopted in the course of 2026, a pilot exercise could start in mid 2027, and the Eurosystem aims to be ready for a potential first issuance during 2029 [10].

UAE cross border CBDC execution and mBridge positioning

- The Central Bank of the UAE describes mBridge as a multi CBDC platform using DLT for international fund transfers between participating banks, with early results indicating speed improvements from multiple days to seconds and potential correspondent cost reductions [4].
- UAE public reporting indicates a January 2024 cross border transfer of AED 50,000,000.00 to China via mBridge, illustrating large value operational use in a strategic corridor [11].

China and Hong Kong cross boundary retail linkage

- In May 2024, HKMA and PBoC expanded the cross boundary e CNY pilot in Hong Kong, including wallet setup for Hong Kong residents and top ups via the Faster Payment System, described by HKMA as the first linkage of a faster payment system with a CBDC system [5].

Project Agorá as a parallel track to CBDC only models

- In April 2024, the BIS announced Project Agorá with seven central banks and private sector participants to explore tokenisation of wholesale central bank money and commercial bank deposits on programmable platforms to improve cross border payments speed and cost [12].

Why these milestones matter for margin reset

- They demonstrate that the design space is widening beyond retail CBDCs into wholesale CBDCs, tokenised deposits, and unified ledgers, each with different implications for who earns fees, who provides liquidity, and who controls compliance.
- They compress decision timelines: with G20 targets set for end 2027, jurisdictions face pressure to show measurable improvements, making pilots and standards choices in 2026 to 2027 strategically consequential [2].

1.4. Implications for central banks, regulators, and sovereign financial strategy

CBDC pilots and tokenised settlement projects create immediate strategic implications for public authorities, even before any full scale issuance.

Implications for central banks

- Rail governance becomes a core monetary sovereignty function: Central banks must decide whether cross border settlement will occur on domestic rails, allied multilateral platforms, or foreign governed infrastructures, and what policy hooks are required for oversight.
- Liquidity and FX policy transmission may change: If FX conversion and settlement migrate to programmable platforms, central banks may need new tools for intraday liquidity, collateral policy, and market making backstops in tokenised environments.
- Operational readiness becomes geopolitical readiness: The ability to participate in multi currency platforms, or to interoperate safely with them, becomes part of national resilience planning.

Implications for regulators and supervisors

- New perimeter questions: Wallet providers, gateway operators, and interoperability connectors can become systemically important even if they are not banks, requiring updated licensing, auditability, and operational resilience regimes.
- Embedded compliance changes enforcement models: When compliance logic is implemented at the protocol or platform level, regulators must validate code, governance, and update processes, not only institutional policies.
- Arbitrage risk increases at interfaces: Cross border interoperability points can be exploited to route around stricter regimes, making harmonized data standards and shared supervisory protocols more important.

Implications for sovereign financial strategy

- Strategic choice is not only cost reduction: The state must decide who captures the new margin layer created by programmable sovereign money, including fees for access, compliance services, identity, and liquidity provisioning.

- Corridor strategy matters: Governments should prioritize corridors that are economically material and geopolitically sensitive, because early corridor design choices can lock in standards and market structure.
- Alignment with global targets and domestic constraints: Authorities must reconcile international commitments to improve speed and cost by 2027 with domestic political constraints, as illustrated by US legislative efforts to restrict a Federal Reserve CBDC [8].

Immediate framing for decision makers

- Treat CBDC pilots as strategic infrastructure procurement: Evaluate governance, data rights, and interoperability terms with the same rigor as defense grade critical infrastructure.
- Assume margin compression is real but incomplete: Even if settlement costs fall, new rents will emerge around programmability, compliance, and platform access. The policy objective should be to ensure those rents align with national interests and financial stability mandates.

2. The Pre-CBDC Cross-Border Payment Structure

Pre CBDC cross border payments are best understood as a layered stack of messaging, credit intermediation, and settlement across multiple balance sheets and jurisdictions. The system is resilient and globally scaled, but it is structurally intermediated, meaning that speed, transparency, and finality are constrained by the need to route instructions through correspondent networks, manage intraday and overnight liquidity, and satisfy multi jurisdiction compliance obligations. These constraints are not incidental. They are the economic foundation for the legacy margin pool that CBDC pilots now target for compression and reallocation.

A practical baseline is that most cross border payments are not a single transaction but a chain of linked obligations. The payer instructs a payment service provider, the instruction is messaged through standardized formats, the payment is funded through nostro and vostro balances or credit lines, and settlement finality is achieved only when the relevant ledgers are updated across the chain. This architecture makes cross border payments a composite service that bundles messaging, FX conversion, liquidity provision, compliance screening, and operational risk management into one end user price.

2.1. Legacy infrastructure: SWIFT, correspondent banking, intermediated settlement

The legacy cross border stack separates messaging from settlement

- SWIFT role: SWIFT provides secure standardized financial messaging used by banks and market infrastructures to exchange payment instructions and related data. It is not itself a settlement system, but it is a dominant coordination layer for cross border payment messages and related workflows, with global reach across more than 200 countries and territories and more than 11,500 connected institutions. These scale indicators are reported by SWIFT in its traffic highlights[13] .

- Message volume as a proxy for dependence: SWIFT reports an average daily number of FIN messages of 44,000,000.00 and total FIN messages of 11,000,000,000.00 for 2022, illustrating the scale of legacy message based coordination even as settlement remains fragmented across jurisdictions[13] .

Correspondent banking is the dominant settlement pathway for many cross border bank payments

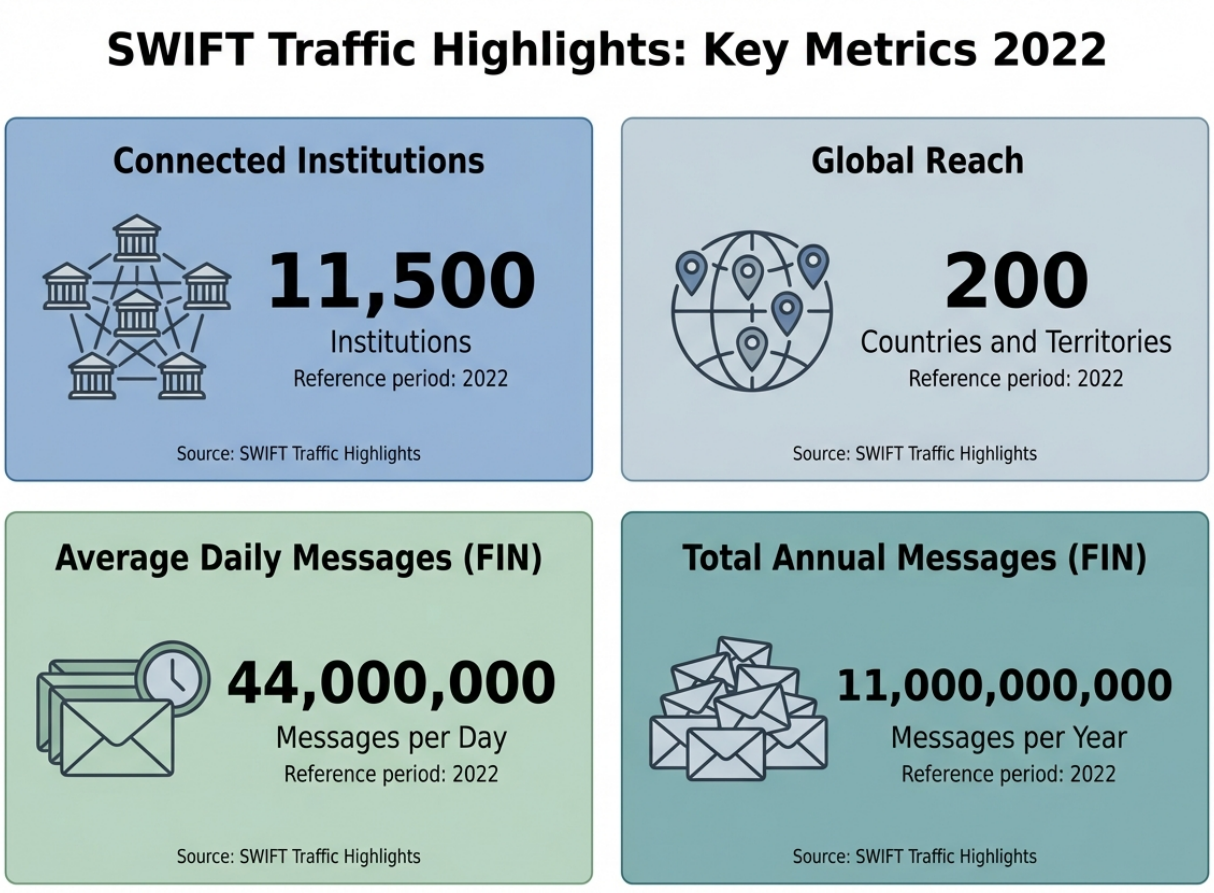
- Correspondent banking mechanics: A bank in one jurisdiction holds an account with a correspondent bank in another jurisdiction, typically a nostro account, to access local clearing and settlement. Payments are executed by debiting and crediting these accounts across a chain of correspondents when no direct relationship exists.
- Intermediated settlement and chain length: When direct correspondent links are absent, payments traverse multiple intermediaries, increasing operational steps, reconciliation needs, and points of failure. The BIS has documented that reduced access can lead to longer payment chains[14] .
- Network shrinkage and concentration: BIS CPMI analysis based on SWIFT message data has shown a material decline in active correspondent banking relationships over time, contributing to concentration and potential chain lengthening. For example, CPMI reported a 20.0% reduction in relationships over seven years in a 2019 release, and BIS analysis has documented a 20.0% fall in the number of correspondent banks between 2011 and 2018[14] .

Settlement finality remains anchored in central bank money, but access is indirect for most actors

- Central bank money as the final settlement asset: Final settlement for domestic legs typically occurs in RTGS systems in central bank money, while cross border settlement is achieved through linked domestic settlements and balance sheet movements across correspondents.
- Time zone and operating hour constraints: Because settlement occurs in domestic systems with jurisdiction specific operating hours and rules, cross border payments inherit cutoffs, batching, and non overlapping business hours, unless special arrangements exist.

Title: Selected quantitative indicators of legacy cross border payment infrastructure

Indicator	Value	Reference period	Source
SWIFT connected institutions (count)	11,500.00	2022	SWIFT Traffic Highlights [13].
SWIFT countries and territories reached (count)	200.00	2022	SWIFT Traffic Highlights [13].
SWIFT FIN average daily messages (messages)	44 million	2022	SWIFT Traffic Highlights [13].
SWIFT FIN total messages (messages)	11 billion	2022	SWIFT Traffic Highlights [13].



Source: SWIFT Traffic Highlights page for 2022 metrics [13].

2.2. Margin breakdown: fees, FX spreads, compliance and liquidity provisioning costs

In the pre CBDC model, the end user price of a cross border payment is a bundled margin that compensates multiple actors for distinct services and risks. The composition varies by segment

- Wholesale bank to bank and corporate payments: Pricing is often relationship based and opaque, with margins embedded in FX spreads, lifting fees, correspondent charges, and liquidity costs.
- Retail remittances: Pricing is more observable and typically higher as a share of principal, reflecting smaller ticket sizes, higher fixed compliance costs per transaction, and less bargaining power.

Observable evidence from remittances provides a useful baseline for the magnitude of retail cross border margins.

- Global average remittance cost: The World Bank Remittance Prices Worldwide site reports a global average cost of 6.49% for sending remittances, with the last update shown as August 18, 2025[15] .
- Segment differences by channel: World Bank reporting has shown banks as the costliest channel in prior global snapshots, reflecting higher overhead and compliance costs, while digital channels tend to be cheaper. For example, the World Bank reported that in Q4 2023 the global average cost of sending USD 200 was 6.4%, with digital remittances at 5.0% versus 7.0% for non digital methods[16] .

A functional decomposition of the margin pool

- Explicit fees: Origination fees charged by the sending institution, intermediary lifting fees, and beneficiary bank receipt fees.
- FX conversion spread: The difference between the applied customer rate and a reference rate, often the largest component in retail corridors.
- Compliance and screening costs: KYC onboarding, sanctions screening, transaction monitoring, investigations, and reporting obligations.
- Liquidity provisioning and balance sheet costs: Prefunding nostro accounts, intraday liquidity, credit lines, and capital usage for settlement and counterparty exposures.

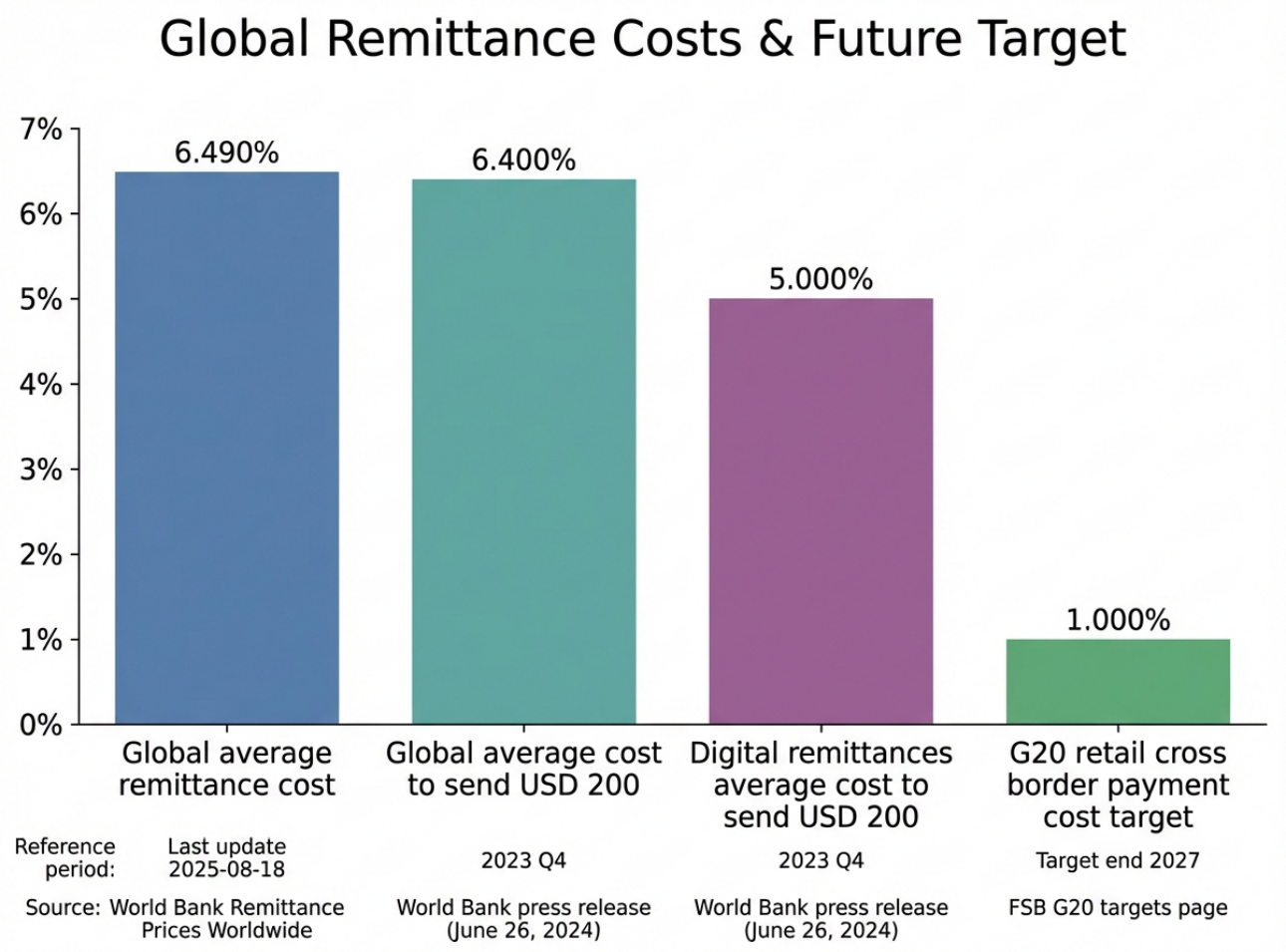
- Operational and exception handling costs: Repairs due to data quality issues, investigations, recalls, and reconciliation across multiple ledgers.

Policy relevant benchmark targets highlight how far legacy pricing is from desired outcomes

- G20 targets for cross border payments: The FSB sets quantitative targets endorsed by the G20, including a retail target of global average cost no more than 1.0% with no corridors above 3.0% by end 2027, and a remittance target aligned to the UN SDG of global average cost no more than 3.0% by 2030 with no corridors above 5.0%[2] .

Title: Cost benchmarks for retail cross border payments and remittances

Metric	Value (%)	Reference period	Source
Global average remittance cost	6.490%	Last update 2025-08-18	World Bank Remittance Prices Worldwide [15].
Global average cost to send USD 200	6.400%	2023 Q4	World Bank press release (June 26, 2024) [16].
Digital remittances average cost to send USD 200	5.000%	2023 Q4	World Bank press release (June 26, 2024) [16].
G20 retail cross border payment cost target	1.000%	Target end 2027	FSB G20 targets page [2].



Source: World Bank Remittance Prices Worldwide and World Bank remittances press release, plus FSB G20 targets page [2].

2.3. Regulatory architecture governing traditional cross-border flows

The pre CBDC regulatory architecture is multi layer and multi jurisdictional, with overlapping mandates that shape both cost and control.

- AML CFT global standards: FATF Recommendations set baseline expectations for customer due diligence, recordkeeping, suspicious transaction reporting, and payment transparency. FATF Recommendation 16 governs information that should accompany wire transfers, and FATF updated its standards on Recommendation 16 in June 2025, with further assessment methodology updates noted in October 2025[17] .

- Sanctions compliance: Financial institutions must screen parties and transactions against sanctions lists and implement blocking or rejection rules. This is operationally embedded in payment processing and is a major driver of exception handling and de risking behavior.
- Prudential and conduct regulation: Banks providing cross border services are subject to capital, liquidity, operational resilience, and consumer protection requirements that influence pricing and service availability.
- Payment system oversight: Central banks and other authorities oversee systemically important payment systems and set expectations for governance, risk management, and operational resilience.

A key structural point is that regulation is enforced through intermediaries

- Intermediary centric enforcement: In correspondent banking, compliance obligations are distributed across multiple institutions in the chain, each applying its own risk appetite and controls. This creates duplicated screening and inconsistent outcomes.
- Data and messaging standardization as a regulatory enabler: Harmonized structured data improves screening quality and reduces repairs. BIS CPMI has emphasized harmonized ISO 20022 data requirements as a key deliverable under the G20 cross border payments program[18] .
- Governance and oversight for cross border interlinking: BIS CPMI has highlighted that governance and oversight are especially challenging for cross border interlinking arrangements due to their multi jurisdictional nature, and that these arrangements are a priority for achieving the G20 targets[19] .

Country examples illustrating the legacy regulatory posture

- United States: Cross border USD payments are heavily shaped by sanctions and AML enforcement expectations applied through regulated banks and their correspondents, reinforcing the role of large global banks as compliance gatekeepers.
- European Union: Cross border euro payments combine EU level AML rules and sanctions implementation with national competent authority supervision, while also pushing harmonization through messaging and data standards adoption.
- China: Cross border RMB flows are influenced by capital flow management and licensing regimes, with cross border payment access mediated through regulated institutions and designated infrastructures.

These examples matter for CBDC pilots because they show that the legacy system ties regulatory control to balance sheet intermediaries and messaging standards, rather than to the settlement asset itself.

2.4. Embedded inefficiencies and cost drivers in incumbent systems

The incumbent system has persistent frictions that are structural, not merely technological

- Fragmented operating hours and time zones: Cross border payments inherit cutoffs and non overlapping business hours across domestic systems, increasing settlement delays and liquidity buffers.
- Prefunding and trapped liquidity: Nostro accounts require prefunding across currencies and jurisdictions, tying up liquidity and creating opportunity costs.
- Multi hop routing and opacity: Longer correspondent chains reduce transparency on fees, FX rates, and payment status, and increase the probability of delays.
- Data quality and message repairs: Inconsistent data fields and formatting lead to manual intervention, investigations, and higher operational costs. BIS CPMI has identified fragmentation and inconsistent implementation of ISO 20022 as a contributor to cross border frictions, motivating harmonized data requirements[18] .
- Network concentration and access risk: As correspondent relationships decline and concentrate, some corridors become more dependent on fewer providers, potentially increasing costs and reducing resilience. BIS analysis has linked reduced access to longer payment chains and noted the decline in correspondent banks[14] .

These inefficiencies translate into cost drivers that are difficult to eliminate without changing the settlement model

- Fixed compliance costs dominate small value payments: Screening and monitoring costs do not scale down linearly with transaction size, pushing up percentage costs in remittances.
- Exception handling is a hidden margin sink: Investigations, recalls, and repairs consume staff time and create delays that require additional liquidity buffers.
- Interoperability gaps create duplicated controls: Each intermediary applies its own screening and data validation, increasing false positives and processing time.

The G20 cross border payments program frames these frictions as a multi dimensional problem spanning cost, speed, transparency, and access, with targets set for end 2027[20] .

2.5. Insight: High margins as compensation for compliance burdens, sanctions enforcement, and liquidity risk

In the pre CBDC regime, high margins are not only rents. They are also a risk premium and a cost recovery mechanism for functions that governments implicitly rely on intermediaries to perform.

- Compliance burden premium: Banks and payment providers price in the cost of KYC, AML monitoring, sanctions screening, and regulatory reporting. FATF payment transparency requirements, including the updated Recommendation 16 standards, increase the data and control expectations on payment chains, raising implementation and operational costs[17] .
- Sanctions enforcement as a service layer: In practice, sanctions compliance is operationalized by private intermediaries that must invest in screening systems, investigations teams, and legal risk management. This creates a margin layer tied to geopolitical policy, especially in reserve currency corridors.
- Liquidity and settlement risk premium: Correspondent banking requires prefunding and intraday liquidity management across time zones. Providers charge for credit lines, balance sheet usage, and the risk of delayed settlement or failed payments.
- De risking and access pricing: Where compliance risk is perceived as high, providers may exit corridors or raise prices. BIS research has found that complete loss of access is rare but that reduced access can lead to longer payment chains, and that costs can be higher where access is more limited[14] .

This framing is essential for CBDC policy analysis

- If CBDC pilots compress margins by automating compliance and reducing liquidity needs, the legacy premium shrinks.
- If CBDC pilots shift compliance and sanctions enforcement from intermediaries to protocol or central bank operated layers, the margin does not disappear. It relocates to whoever operates and governs the new compliance and liquidity functions.

The baseline evidence that retail cross border costs remain materially above global policy targets reinforces that the legacy margin pool is large enough to motivate structural change, while also indicating that a portion of that margin is compensating for real compliance and liquidity costs rather than pure inefficiency[2] .

3. CBDC Pilots: Structural Disruption to Payment Margins

CBDC pilots are not simply digitising existing payment instruments. They are testing new settlement and market structure primitives that can relocate where cross border payment value is captured. In the pre CBDC stack, margins are distributed across correspondent banking, nostro liquidity, FX intermediation, compliance screening, and operational reconciliation. In CBDC pilot architectures, several of these functions are either compressed through atomic settlement and shared ledgers, or re expressed as protocol level services such as embedded compliance, programmable liquidity, and rule based access control.

Across jurisdictions, pilots increasingly converge on a small set of design goals that directly affect margins

- Reduce trapped liquidity by enabling near real time settlement in central bank money across time zones.
- Reduce reconciliation and exception handling by using shared data models and token based settlement finality.
- Reduce FX and intermediary spreads by enabling direct PvP settlement and, in some designs, automated liquidity pricing.
- Increase sovereign control by moving compliance and access rules closer to the settlement layer.

The result is a structural shift in margin composition. Traditional margins tied to multi hop intermediation and operational opacity tend to compress. New margin layers emerge around governance of interoperability, access to CBDC liquidity, identity and compliance attestations, and the operation of gateways that connect CBDC ledgers to legacy RTGS and commercial bank systems.

3.1. Leading CBDC initiatives and pilots globally: Project Mariana, digital euro, e-Rupee, e-Dirham, mBridge (status updates)

Project Mariana

- Objective: Test cross border FX trading and settlement using wholesale CBDCs with decentralised finance style mechanisms, specifically automated market makers, plus bridges and a common token standard on a public blockchain. This targets the FX and settlement margin layer by exploring automated pricing and immediate settlement. The BIS describes the proof of concept as successfully trading and settling hypothetical EUR, SGD, and CHF wholesale CBDCs and explicitly highlights AMMs as a potential basis for a new generation of financial market infrastructures [21].

Digital euro

- Status as of October 2025: The Eurosystem completed its preparation phase that ran from November 2023 to October 2025 and moved to a next phase focused on technical readiness. The ECB states that if EU legislation is adopted in the course of 2026, a pilot exercise could start as of mid 2027, and the Eurosystem aims to be ready for a potential first issuance during 2029 [22].
- Margin relevance: The digital euro is primarily a domestic retail instrument in policy framing, but its scheme rulebook, offline capability work, and platform provider selection are building blocks for future cross border interoperability. This matters because the EU can influence margin capture by standard setting and by defining who can operate wallets, gateways, and compliance services.

India e Rupee

- Status as of March 2025: RBI reported retail CBDC value in circulation of INR 1,016.5 crore as of end March 2025, up from INR 234.0 crore at end March 2024, and noted expansion of the retail pilot to 17 banks and 6 million users by end March 2025. RBI also indicated it is exploring cross border CBDC pilots on bilateral and multilateral bases to address turnaround time, efficiency, and transparency challenges [23].
- Margin relevance: India is pairing scale in domestic pilots with explicit cross border intent. This combination positions India to negotiate interoperability terms that affect remittance and trade payment margins, especially where INR corridors are currently priced with high FX spreads and correspondent fees.

UAE e Dirham and Digital Dirham

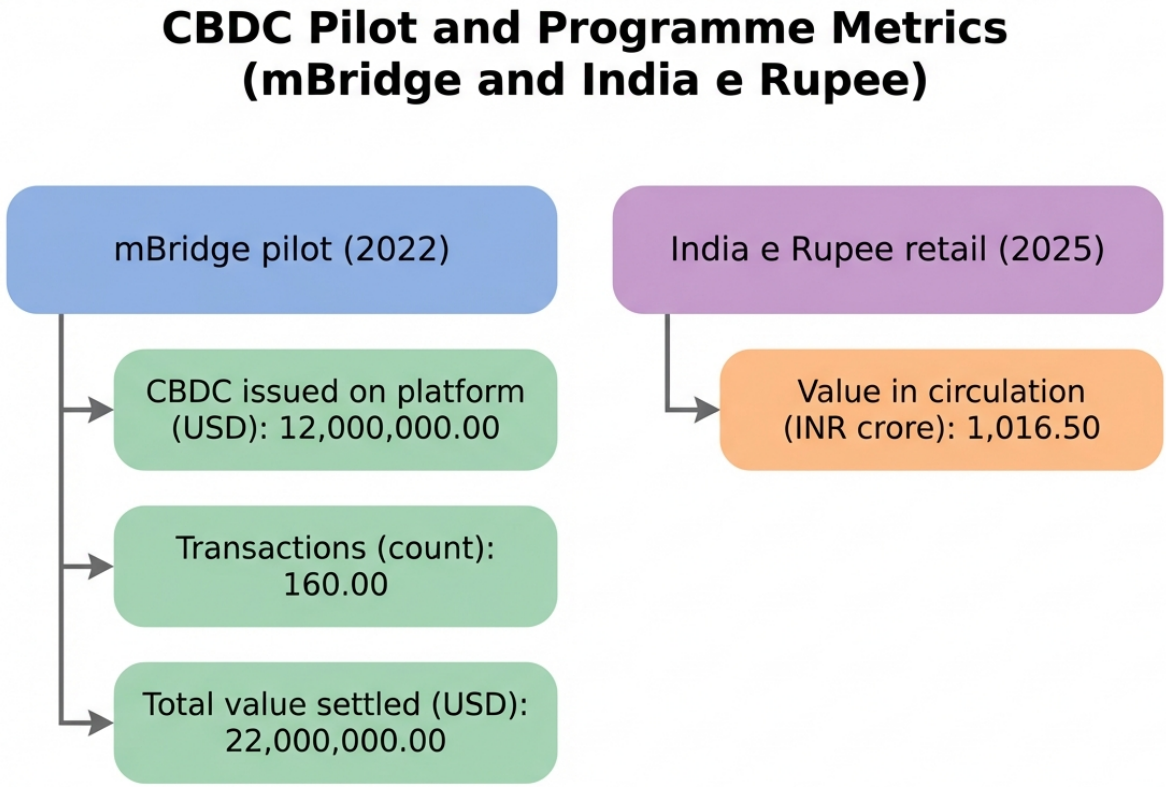
- Status: UAE authorities have publicly positioned the Digital Dirham as a universal payment instrument and have executed government transactions using the Digital Dirham with settlement reported in under two minutes in late 2025, with public references to mBridge as the cross border settlement platform used in early transactions [24].
- Margin relevance: The UAE is explicitly linking domestic CBDC rollout to cross border settlement infrastructure, aiming to reduce remittance and trade settlement costs while increasing regional payment autonomy.

mBridge

- Status: BIS reports that mBridge reached minimum viable product stage in mid 2024, with Saudi Central Bank joining in 2024. The BIS frames the project as addressing high costs, low speed, and operational complexities in cross border payments [25].
- Quantitative pilot results: The 2022 mBridge pilot involved real value transactions among 20 commercial banks across four jurisdictions, with over USD 12 million issued on platform and over 160 payment and FX PvP transactions totalling more than USD 22 million in value [26].

Title: Selected quantitative signals from CBDC related pilots and programmes

Pilot or programme	Metric	Value	Reference date (YYYY)
mBridge pilot	CBDC issued on platform (USD)	12 million	2022
mBridge pilot	Transactions (count)	160.00	2022
mBridge pilot	Total value settled (USD)	22 million	2022
India e Rupee retail	Value in circulation (INR crore)	1,016.50	2025



Source: BIS mBridge report [26], RBI annual report coverage via Moneycontrol [27].

Implication for margins

- Mariana and mBridge target wholesale cross border settlement and FX, where margins are often embedded in spreads, liquidity buffers, and operational risk premia.
- Digital euro and e Rupee retail pilots build domestic scale and governance frameworks that can later be extended to cross border corridors, shifting bargaining power over standards, access, and compliance rules.

3.2. Emerging technical architectures: AMMs, blockchain bridges, CCIP, ISO 20022-based connectors, interoperability gateways

CBDC pilots are converging on a layered architecture that separates settlement finality, interoperability, and compliance orchestration. This is important for margins because each layer can become a new toll point or a new compression point.

Automated market makers for FX and liquidity

- In Project Mariana, AMMs were used to price and execute spot FX transactions automatically with immediate settlement, using pooled liquidity of multiple wholesale CBDCs. The BIS highlights AMMs as a tested DeFi element in the proof of concept [21].
- Margin effect: AMMs can reduce dealer intermediation spreads for certain spot conversions, but they introduce new costs and governance questions around liquidity provision, pool access, and algorithmic pricing controls.

Blockchain bridges and multi ledger transfer mechanisms

- Mariana explicitly tested bridges for seamless transfer of wholesale CBDCs between different networks, alongside a common token standard on a public blockchain [21].
- Margin effect: Bridges can reduce operational friction and reconciliation costs, but they also create a critical control point. Whoever operates or certifies the bridge can capture fees and enforce policy constraints.

Interoperability gateways and connector models

- Swift has tested a CBDC interlinking solution intended to connect multiple networks and enable institutions to use existing infrastructure alongside CBDCs and tokenised assets. In its second phase sandbox experiments, Swift reported 38 institutions participating, over 125 sandbox users, and more than 750 transactions across use cases including payments, FX, tokenised assets, and digital trade [28].
- Margin effect: Gateway models preserve incumbent messaging and operational roles, potentially slowing full disintermediation. They can compress some reconciliation costs while sustaining a service margin for orchestration, compliance messaging, and network access.

ISO 20022 based connectors

- Many CBDC interoperability approaches align with ISO 20022 messaging and data harmonisation because cross border margin is heavily driven by data quality, compliance screening, and exception handling. Connector architectures that map token events to ISO 20022 messages can reduce repair and investigation costs while maintaining compatibility with existing compliance tooling.

Cross chain interoperability protocols and CCIP style patterns

- While not CBDC specific, cross chain interoperability patterns are increasingly relevant where tokenised deposits, stablecoins, and CBDCs coexist. The technical direction is toward standardised message formats, attestation frameworks, and policy aware routing. For regulators, the key margin question is whether cross chain routing becomes a private rent layer that sits above sovereign settlement rails.

Design tension

- Shared ledger models compress margins by collapsing reconciliation and enabling atomic settlement.
- Gateway and connector models compress margins more incrementally but can preserve incumbent fee layers and create new ones around orchestration and certification.
- AMM and on chain FX models can compress spreads in some conditions but may shift margin to liquidity providers and to governance of pool access and risk controls.

3.3. Mechanisms by which CBDCs compress margins: disintermediation, protocol-level compliance, central bank pricing leverage

CBDC pilots compress cross border payment margins through three primary mechanisms.

Disintermediation of correspondent chains and nostro liquidity

- Wholesale CBDC platforms can enable direct settlement between participating institutions in central bank money, reducing the need for multi hop correspondent routing and reducing trapped liquidity held for settlement risk management.
- In mBridge, the design goal is instant cross border payments and settlement on a shared platform among participating central banks and commercial banks, explicitly targeting inefficiencies of cost, speed, and operational complexity [25].

Protocol level compliance and embedded policy controls

- CBDC systems can embed identity, transaction metadata, and rule enforcement closer to the settlement layer. This can reduce duplicative screening and post trade investigations that currently contribute to operational cost and margin.
- The policy trade is that protocol level compliance can also increase sovereign leverage. It can make compliance cheaper for permitted flows while making prohibited flows harder to route around, shifting margin away from private compliance service providers and toward state defined access frameworks.

Central bank pricing leverage and market structure power

- When settlement occurs in central bank liabilities on a platform governed by central banks, the public sector can influence the pricing of access, liquidity, and operating rules. Even if central banks do not charge explicit fees, they can shape the competitive landscape by defining who can connect, under what conditions, and with what technical requirements.
- In practice, this can compress private intermediary margins while creating new quasi rents for regulated gateway operators, wallet providers, and compliance attestation services that are authorised to interface with the CBDC system.

FX margin compression via PvP and automated execution

- PvP settlement reduces settlement risk premia embedded in spreads for certain corridors and time windows.
- Mariana demonstrates a model where spot FX can be priced and executed automatically via AMMs with immediate settlement, which is structurally different from dealer mediated FX and can reduce some intermediation costs while shifting revenue to liquidity provision and protocol governance [9].

Where margin does not disappear

- Liquidity still has a cost. CBDC platforms can reduce the amount of liquidity needed and the duration it is trapped, but they do not eliminate the need for liquidity provision.
- Compliance still has a cost. CBDCs can reduce duplication, but they can also increase the cost of meeting stricter data and identity requirements.

- Interoperability still has a cost. Gateways, connectors, and bridges become new margin bearing infrastructure, especially in a fragmented geopolitical environment where not all CBDC systems interoperate on equal terms.

3.4. Early empirical signals from pilots (e.g., Project Mariana, Swift sandbox, UAE, Hong Kong)

Empirical evidence is still early and often reported as technical feasibility rather than cost and margin outcomes. However, several measurable signals from pilots indicate where margin compression is likely to materialise first.

Project Mariana signals

- The BIS reports successful cross border trading and settlement of hypothetical wholesale CBDCs using a public blockchain, bridges, and an AMM for automated spot FX pricing and execution. This demonstrates feasibility of immediate settlement and automated FX execution, which are direct levers for compressing settlement risk premia and operational overhead in wholesale cross border flows [21].

Swift sandbox signals

- Swift reported that its second phase CBDC sandbox experiments involved 38 institutions, over 125 sandbox users, and more than 750 transactions across simulated digital trade, tokenised asset and FX networks, and payments. This indicates that interoperability via connector models is operationally plausible at meaningful participant scale, supporting a pathway where margin compression comes from reduced integration cost and reduced operational friction rather than from full replacement of incumbent networks [28].

UAE signals

- Public reporting indicates UAE executed early Digital Dirham transactions with settlement in under two minutes and referenced mBridge as the platform used for early cross border settlement demonstrations. While not a full cost study, sub two minute settlement is a strong proxy for reduced operational float and reduced time based fees in certain government and wholesale style flows [24].

Hong Kong signals

- HKMA published the e HKD Pilot Programme Phase 2 Report in October 2025, summarising findings from 11 groups of industry pilots across tokenised asset settlement, programmability, and offline payments. HKMA noted that e HKD and tokenised deposits can enable cost efficient, programmable, and resilient transactions, and also observed that the public perceived e HKD and tokenised deposits similarly in Hong Kong given trust in the banking system. HKMA concluded the immediate priority lies beyond retail use cases and will prioritise future work in wholesale payments to support tokenisation and cross border payments such as international trade settlement [29].

What these signals imply for margin reset

- Wholesale first: The most concrete progress on margin relevant compression is in wholesale settlement and FX PvP, where pilots can directly reduce settlement time, reconciliation, and settlement risk.
- Interoperability as the new margin layer: Swift style connector experiments suggest that even if CBDCs proliferate, the economic rents may shift to interoperability gateways and orchestration services rather than disappearing.
- Programmability as selective compression: Hong Kong and India style programmability pilots indicate that targeted payments and conditional transfers can reduce leakage and administrative overhead, but they also create new compliance and rule authoring functions that can become a new cost and margin layer.

Evidence gaps that remain material for policymakers

- Few pilots publish corridor level end user cost reductions, FX spread changes, or compliance cost deltas in a way that can be compared to incumbent benchmarks.
- Most results are bounded by controlled participant sets and do not yet reflect adversarial conditions such as sanctions screening at scale, cyber stress, or liquidity shocks.
- As of February 12, 2026, the strongest publicly documented quantitative evidence remains mBridge 2022 real value pilot volumes and counts, plus participation and transaction counts in Swift sandbox reporting, rather than audited margin compression metrics [28].

4. Regulatory Arbitrage Under CBDC Pilots

CBDC pilots are not only compressing legacy cross border payment margins, they are also creating new regulatory seams where value and risk can be routed. The core arbitrage dynamic shifts from exploiting correspondent banking opacity to exploiting interoperability design choices, access tiering, identity and data standards, and the governance of shared ledgers. In practice, the most material arbitrage opportunities arise when a transaction can be structured so that the strictest rule set applies only to a narrow segment of the flow, while the economic substance is executed or netted elsewhere.

Two structural features of the pilot era amplify this

- Interoperability is being pursued through connectors, bridges, and shared ledgers that intentionally reduce frictions between networks, but those same mechanisms can reduce the effectiveness of jurisdiction specific controls if policy alignment is incomplete.
- Fragmentation is increasing because pilots are being built for different strategic objectives, including sanctions resilience, regional trade settlement, domestic retail modernization, and wholesale market efficiency, which produces inconsistent access rules and compliance expectations.

For regulators, the key policy question becomes how to prevent a race to the bottom in cross border CBDC connectivity while still enabling efficiency gains. For central banks, the key operational question becomes how to preserve enforceable monetary and regulatory perimeter controls when settlement finality can occur in seconds on rails that may be partially outside domestic supervisory reach.

4.1. New arbitrage pathways enabled by CBDC interoperability and fragmentation

Interoperability creates a new class of arbitrage that is closer to protocol design than to traditional entity level supervision.

Primary pathways

- Connector based perimeter hopping: When CBDC networks are linked through interoperability connectors, participants can route payments through the connector path that applies the least restrictive onboarding, data, or transaction rule set, while still achieving settlement in central bank money on the destination side. Swift has publicly demonstrated connector based interlinking across multiple networks and legacy rails, explicitly targeting multi network interoperability for CBDCs and tokenised assets, which increases the number of possible routing paths and therefore the number of compliance edge cases. This was evidenced by sandbox simulations and subsequent beta testing with central banks and financial institutions [30].
- Tier arbitrage across wallet and participant classes: Many pilots use tiered access models, with simplified onboarding for low risk wallets and higher limits for fully verified users. Cross border interoperability can allow actors to split flows across tiers and jurisdictions, keeping each leg below thresholds while achieving large aggregate movement.
- Data model arbitrage: If two CBDC systems require different originator and beneficiary data fields, actors can exploit the least demanding schema at the entry point and rely on imperfect mapping when messages are translated across standards.
- Time and finality arbitrage: Near real time settlement reduces the window for ex post interdiction. If one jurisdiction relies more heavily on post transaction monitoring while another relies on pre transaction screening, interoperability can be used to settle first and contest later.

Why fragmentation matters

- Divergent policy objectives produce divergent rule sets. A system optimized for domestic retail inclusion will not embed the same controls as a system optimized for wholesale PvP settlement.
- Fragmentation increases the incentive to build alternative corridors. As more corridors exist, the marginal cost of avoiding a restrictive corridor falls, and the economic value of routing intelligence rises.

Regulatory implication

- The arbitrage surface is no longer only about where an institution is licensed. It is also about which network segment performs identity proofing, which segment performs sanctions screening, and which segment provides settlement finality.

4.2. Geopolitical arbitrage in a multipolar CBDC landscape (e.g., mBridge retreat, regional pilots)

In a multipolar CBDC environment, geopolitical alignment becomes a pricing and access variable. Actors can arbitrage not only regulatory strictness but also geopolitical tolerance, including sanctions exposure, data localization expectations, and corridor availability.

mBridge as a reference case for corridor competition

- Hong Kong authorities have described mBridge as reaching a Minimum Viable Product stage in 2024 and becoming part of Hong Kong's financial market infrastructure, with continued expansion and integration work planned. This framing signals a shift from experimental proof of concept toward operational corridor building, which increases the likelihood that firms will treat it as a viable alternative route for certain trade flows [31].
- HKMA leadership has also publicly emphasized that mBridge reduced cross border transaction time from days to seconds, reinforcing the corridor's strategic value for corporates seeking speed and certainty [32].

Geopolitical arbitrage patterns

- Sanctions and de risking avoidance: If a corridor is perceived as less exposed to secondary sanctions risk or correspondent bank de risking, trade counterparties may prefer it even at similar cost, because the expected probability of payment disruption is lower.
- Data sovereignty arbitrage: Some corridors may embed stronger domestic data retention and access provisions. Firms may route transactions through jurisdictions with weaker data localization or less intrusive supervisory access, especially for commercially sensitive trade flows.
- Bloc based liquidity and FX formation: If CBDC corridors embed on ledger FX mechanisms or privileged access to official liquidity, participants may route flows to capture better execution or lower collateral requirements.

Country example China and Hong Kong

- The cross boundary e CNY pilot expansion in Hong Kong explicitly enabled wallet setup using Hong Kong phone numbers and top ups via Hong Kong's Faster Payment System, described as the first linkage of a faster payment system with a CBDC system. This creates a new cross border retail rail that can be used for merchant payments without a Mainland bank account, which can shift flows away from traditional card and correspondent channels and create new perimeter questions about which jurisdiction's consumer protection, AML controls, and data access rules dominate [5].

Strategic implication

- As corridors mature, regulatory arbitrage becomes conflict driven. Firms and states will prefer rails that minimize geopolitical veto points, even if nominal compliance is maintained, because the operational risk of interruption becomes a core component of the effective margin.

4.3. Technical enablers of regulatory circumvention: cross-chain protocols, AMMs, sandbox connectors

CBDC pilots increasingly test technical primitives that can unintentionally enable circumvention if governance and compliance hooks are incomplete.

Cross chain and cross network connectors

- Interlinking solutions are designed to move value across heterogeneous ledgers and between DLT and traditional systems. Swift's CBDC connector work explicitly targets interlinking multiple networks and enabling CBDC and tokenised asset transactions using existing infrastructure, which implies message translation, orchestration logic, and routing across domains. These layers can become the new locus of arbitrage if they are operated by entities outside the strictest supervisory perimeter or if they permit optionality in how compliance data is carried [33].

AMMs and on ledger FX

- AMM based FX mechanisms can compress spreads and reduce reliance on traditional FX intermediaries, but they also introduce new ways to disguise economic intent through liquidity provision, multi hop swaps, and synthetic exposures.

- Project Mariana tested AMMs for cross border FX trading and settlement of hypothetical wholesale CBDCs and explicitly relied on bridges and a common token standard to facilitate exchange and interoperability. This architecture demonstrates how FX execution can be embedded into the settlement layer, which can reduce the visibility regulators traditionally obtain from dealer based FX markets and bank reporting [21].

Sandbox connectors and rapid iteration risk

- Sandboxes accelerate experimentation and broaden participation, but they also normalize patterns where compliance is simulated or simplified. When prototypes transition to production corridors, legacy assumptions about who performs screening and when may not hold.

Compliance relevant technical design choices that can be exploited

- Optional metadata fields or lossy mapping between schemas.
- Split execution where identity is verified in one domain but settlement occurs in another.
- Programmable conditional payments that can be structured to avoid triggering static rule based thresholds.

Regulatory implication

- Supervisors need to treat interoperability middleware, FX smart contracts, and bridge governance as regulated critical infrastructure components, not merely technical plumbing.

4.4. Risk vector: interoperability as a conduit for regulatory divergence or evasion

Interoperability can either harmonize controls or amplify divergence. The risk is highest when interoperability is achieved technically faster than it is achieved legally and institutionally.

Key risk vectors

- Weakest link compliance: If a multi network transaction is only as strong as the least stringent onboarding or screening segment, then interoperability becomes a conduit for importing weaker standards into stricter jurisdictions.

- Rule set ambiguity: When multiple jurisdictions claim supervisory authority over different legs of a transaction, actors can exploit uncertainty about which rules apply to the composite flow.
- Information asymmetry and data minimization: If privacy or data localization constraints prevent full sharing of originator and beneficiary information across networks, then counterparties may receive value without receiving sufficient compliance context.

Why this is intensifying now

- FATF updated Recommendation 16 on payment transparency in June 2025 and published assessment methodology guidance in October 2025, signaling continued tightening and standardization expectations for cross border payment information. Divergent implementation timelines across jurisdictions create a window where interoperability can be used to route around stricter implementations [17].

Operational consequence

- Faster settlement reduces the effectiveness of traditional correspondent bank style layered controls. If interoperability enables atomic settlement across jurisdictions, then pre transaction controls and shared rule enforcement become more important than post transaction remediation.

Policy consequence

- Interoperability governance becomes a de facto regulatory instrument. Whoever sets connector certification rules, message schemas, and compliance attestation requirements can shape which jurisdictions and institutions can participate and on what terms.

4.5. Illustrative arbitrage scenarios from recent pilot developments

The following scenarios are grounded in patterns demonstrated by recent pilots and public disclosures, and illustrate how arbitrage can emerge even when systems are designed for compliance.

Scenario 1 Retail corridor threshold splitting via cross boundary wallet rails

- Mechanism: A user funds multiple low tier wallets and performs repeated merchant payments across the border, keeping each payment below monitoring thresholds while achieving large aggregate value transfer.
- Pilot signal: The Hong Kong cross boundary e CNY pilot enables wallet setup with simplified onboarding and top ups via FPS, creating a new always on retail corridor that can be used without a Mainland bank account [5].
- Implication: Regulators need aggregate level monitoring across wallets and institutions, not only per transaction checks.

Scenario 2 Corridor selection to reduce geopolitical interruption risk for trade settlement

- Mechanism: A corporate routes settlement through a CBDC corridor perceived as less exposed to correspondent bank de risking or sanctions related delays, even if the underlying trade is lawful, because the expected operational risk is lower.
- Pilot signal: HKMA has publicly stated mBridge reduced transaction time from days to seconds and described it as part of Hong Kong's financial market infrastructure after reaching MVP stage in 2024 [32].
- Implication: Payment routing becomes a strategic choice, and corridor governance becomes a lever of geopolitical influence.

Scenario 3 FX execution opacity through on ledger AMM routing

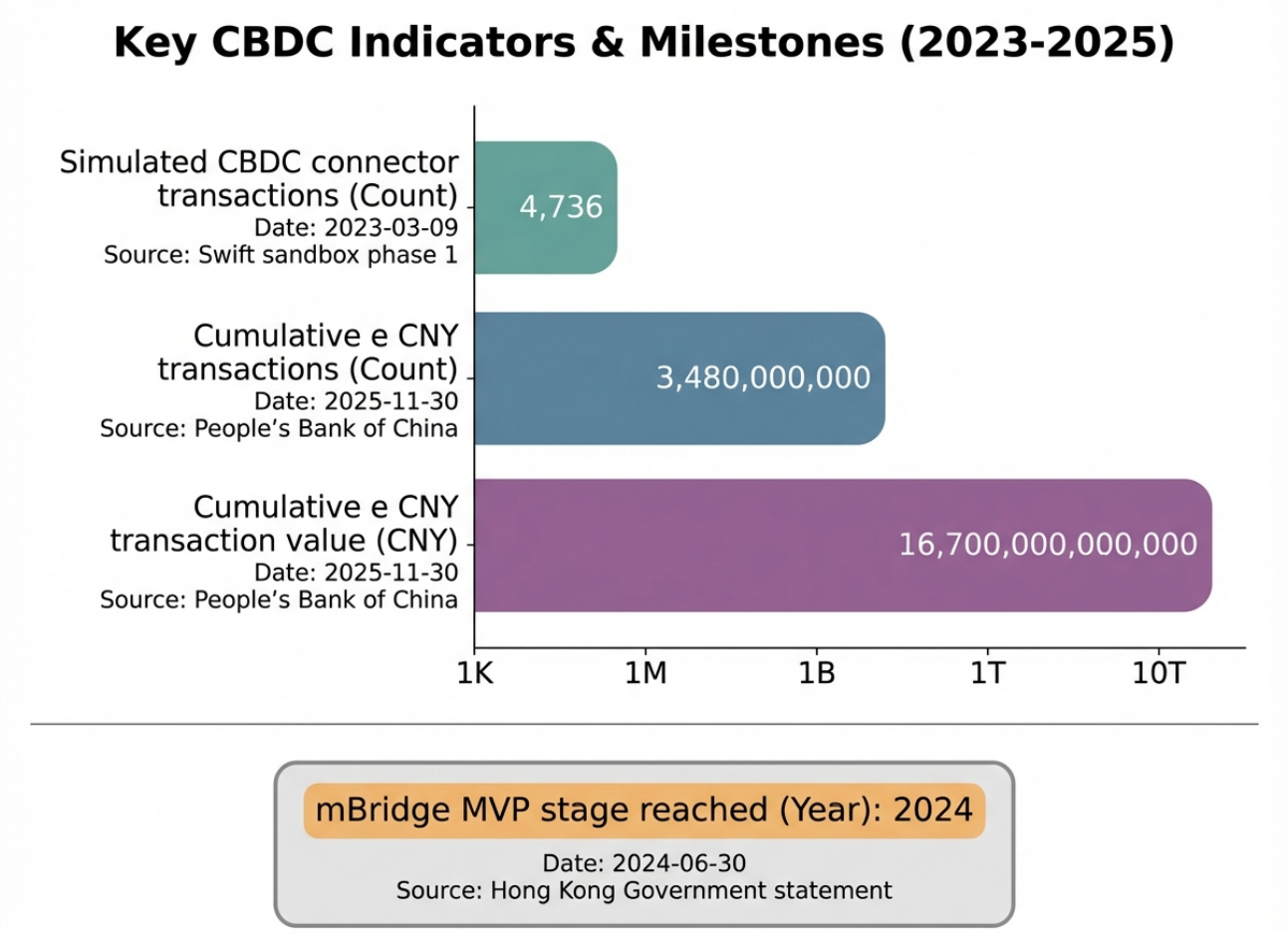
- Mechanism: A participant executes FX via AMM pools and multi hop swaps that replicate economic exposures while reducing reliance on regulated dealer intermediation and associated reporting.
- Pilot signal: Project Mariana demonstrated AMM based spot FX trading and settlement for hypothetical wholesale CBDCs, using bridges and a common token standard [9].
- Implication: Supervisors may need new reporting and surveillance approaches for on ledger FX, including liquidity provider identification and transaction graph analytics.

Scenario 4 Connector jurisdiction shopping for compliance data handling

- Mechanism: A bank chooses an interoperability connector path that minimizes the compliance data it must transmit, relying on schema translation and differing data retention rules across networks.
- Pilot signal: Swift's sandbox and subsequent work explicitly focuses on interlinking CBDCs and tokenised assets across multiple networks, which increases routing optionality and therefore the potential for connector based jurisdiction shopping [34].
- Implication: Connector certification should require mandatory data fields, auditability, and clear allocation of screening responsibility.

Title: Quantitative signals from public CBDC interoperability and corridor disclosures

Indicator	Value (Numeric)	Date (YYYY-MM-DD)	Source jurisdiction or entity
Simulated CBDC connector transactions (Count)	4,736	2023-03-09	Swift sandbox phase 1
Cumulative e CNY transactions (Count)	3,480 million	2025-11-30	People's Bank of China
Cumulative e CNY transaction value (CNY)	16,700 billion	2025-11-30	People's Bank of China
mBridge MVP stage reached (Year)	2024	2024-06-30	Hong Kong Government statement



Source: Swift sandbox disclosure on transaction count [34], PBoC e CNY cumulative transaction metrics as reported by Xinhua and republished on the State Council website [35], Hong Kong Government legislative reply referencing mBridge MVP stage in June 2024 [31].

Overall implication for margin and control

- These scenarios show how the new margin layer can migrate to actors who control routing, interoperability middleware, FX liquidity pools, and compliance attestations. Without coordinated standards and enforceable governance, interoperability can unintentionally subsidize regulatory evasion by making it cheaper and faster to route around the strictest perimeter.

5. Margin Compression vs Sovereign Control

CBDC pilots and adjacent tokenized settlement projects compress legacy cross border payment margins by reducing multi hop intermediation, trapped liquidity, and reconciliation overhead. At the same time, they create a new margin layer tied to access, governance, compliance execution, and liquidity orchestration on sovereign rails. For governments and central banks, the strategic tension is that the most efficient architecture is often the one that concentrates rule setting power in a small number of operators, standards bodies, and connector jurisdictions. The policy objective therefore shifts from lowering end user costs alone to deciding who is permitted to operate the new control points and under what legal and geopolitical constraints.

5.1. Beneficiaries in the evolving CBDC payment ecosystem

The primary beneficiaries are entities that can operate or influence the new control points created by CBDC and tokenized settlement architectures.

- Central banks and sovereign operators: They gain the ability to set pricing, access, and compliance conditions closer to settlement finality, rather than relying on indirect enforcement through commercial bank intermediaries.
- Domestic payment system operators and designated intermediaries: Entities that are selected to provide wallets, onboarding, and compliance services can capture recurring revenues from identity, screening, and transaction services even as FX and correspondent fees compress.
- Large global banks with multi jurisdiction licenses: They are positioned to become preferred liquidity and compliance gateways into multiple CBDC systems, especially where access is tiered and where wholesale corridors require regulated participants.

- RegTech and digital identity providers: As compliance shifts toward continuous, data rich controls, vendors that provide verifiable credentials, sanctions screening, transaction monitoring, and policy rule execution can capture a growing share of the new margin layer.
- Infrastructure and standards gatekeepers: Operators of interoperability gateways, messaging and directory services, and rulebooks can capture rents through certification, conformance testing, and connector participation requirements. Governance and oversight of cross border fast payment system interlinking is explicitly recognized as complex and multi jurisdictional, which tends to increase the value of trusted governance frameworks and operators [19].
- Jurisdictions that become corridor hubs: Countries that host widely used connectors or settlement venues can gain geopolitical leverage by setting participation conditions, data localization requirements, and dispute resolution venues.

Country examples illustrating beneficiary positioning

- European Union: The ECB frames the digital euro as supporting monetary sovereignty and reducing dependence on non European payment providers, with a roadmap that assumes EU legislation in 2026, a pilot exercise potentially starting mid 2027, and readiness for potential issuance during 2029 [10].
- China and Hong Kong: The cross boundary e CNY pilot expansion in Hong Kong enables local wallet setup and top ups via Hong Kong FPS, demonstrating how a jurisdiction can benefit by becoming an onboarding and funding gateway into another sovereign CBDC system [5].
- UAE and regional partners: mBridge reached minimum viable product stage in mid 2024, positioning participating central banks and their supervised banking sectors to benefit from faster settlement and new corridor governance roles [25].

5.2. Entities facing margin erosion or displacement (e.g., correspondent banks, intermediaries)

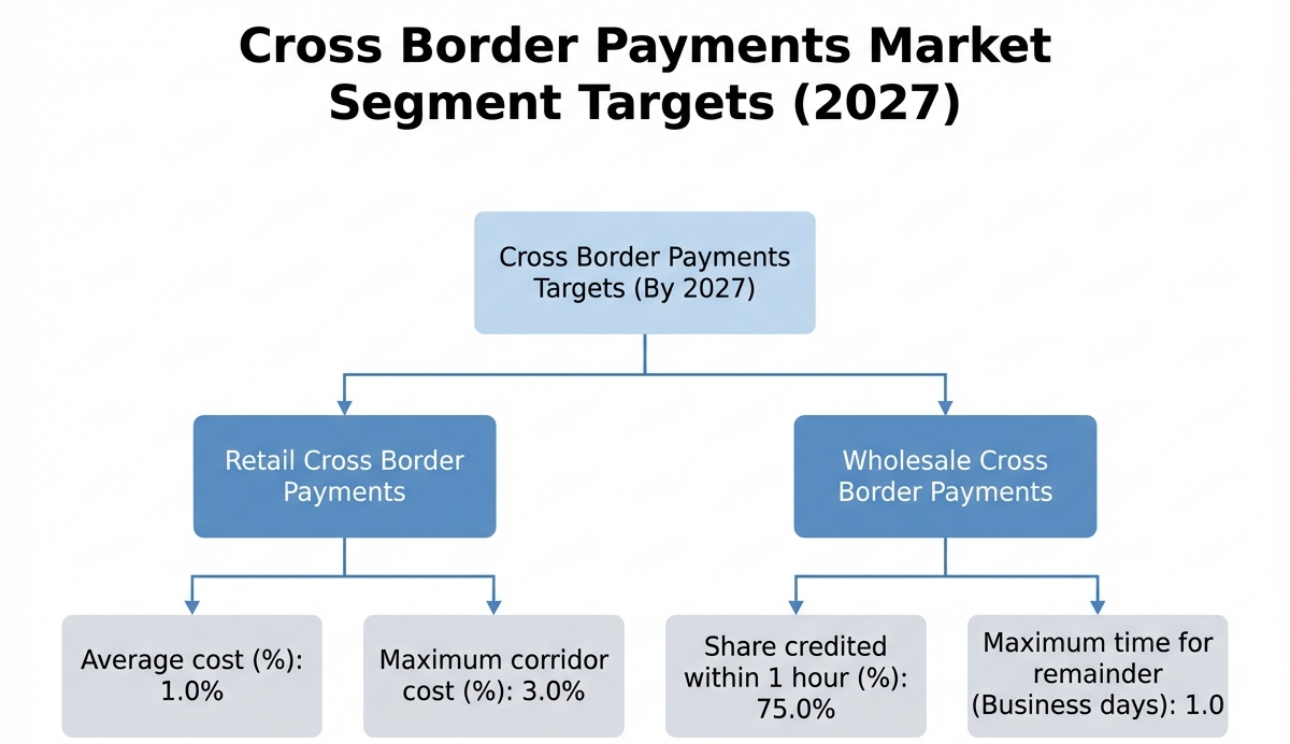
CBDC rails compress margins most directly where legacy intermediaries are paid for delay, opacity, and balance sheet intensive bridging functions.

- Correspondent banks and nostro liquidity providers: If CBDC corridors enable near real time settlement and reduce the need for prefunding, the economic value of maintaining large nostro networks declines, particularly for low volume corridors.
- FX intermediaries relying on wide spreads: PvP settlement and more transparent liquidity access can narrow spreads, shifting FX revenue toward entities that provide on ledger liquidity and algorithmic pricing rather than relationship based markups.
- Messaging and reconciliation service layers: Shared ledgers and standardized data models reduce reconciliation work and exception handling revenue, especially for providers whose value proposition is operational repair.
- Smaller banks and money transfer operators without direct access: If access to CBDC corridors is restricted to regulated participants with high compliance and technical requirements, smaller institutions may be disintermediated or forced into agency roles with thinner margins.
- Card networks and large non bank payment platforms in some corridors: Where governments explicitly pursue sovereignty goals, they may design CBDC schemes to reduce dependence on foreign controlled payment rails. The ECB has explicitly linked the digital euro to protecting European monetary sovereignty and economic security and to strengthening European payments competitiveness and resilience [10].

Margin erosion is not uniform. In practice, many pilots still rely on commercial banks for onboarding, credit, and liquidity. The displacement risk is highest where CBDC corridors are designed for wholesale settlement with direct participation and where compliance is embedded at the platform level rather than delegated to each intermediary.

Title: Quantitative policy targets that intensify margin compression pressure

Market segment	Target metric	Target value	Target date
Retail cross border payments	Average cost (%)	1.0%	2,027
Retail cross border payments	Maximum corridor cost (%)	3.0%	2,027
Wholesale cross border payments	Share credited within 1 hour (%)	75.0%	2,027
Wholesale cross border payments	Maximum time for remainder (Business days)	1.0	2,027



Source: G20 Targets for Enhancing Cross border Payments, Financial Stability Board [2].

These targets matter because they create a policy benchmark that makes legacy margin structures harder to defend politically, even when those margins reflect real compliance and liquidity costs.

5.3. Strategic trade-offs for governments: efficiency gains versus sovereignty and oversight

Governments face a three way trade off among efficiency, sovereignty, and oversight capacity

- Efficiency gains: Faster settlement and reduced intermediated steps can lower costs and improve transparency, aligning with the G20 roadmap targets for end 2027 [2].
- Sovereignty risks: Interoperability can import foreign rule sets into domestic payment flows, especially if domestic institutions depend on foreign operated connectors, foreign identity frameworks, or foreign compliance attestations.
- Oversight capacity constraints: Embedding compliance into CBDC rails can improve enforcement, but it also requires regulators to supervise software defined policy execution, third party code, and cross border governance arrangements. The BIS CPMI highlights that governance and oversight for cross border interlinking is especially challenging due to multi jurisdictional and multi currency features [19].

Key strategic choices that determine whether efficiency gains translate into sovereign advantage

- Access model choice: Direct access for foreign banks and PSPs increases efficiency but can weaken domestic supervisory leverage. Indirect access preserves control but may preserve some legacy margins and reduce competitiveness.
- Data governance choice: Richer data improves AML and sanctions enforcement but increases exposure to cross border data demands and potential extraterritorial requests.
- Interoperability choice: Joining multilateral platforms can reduce corridor costs but may require accepting shared governance, dispute resolution, and technical standards that constrain unilateral policy.

Country examples

- United States: The Federal Reserve leadership has publicly stated it will not develop a CBDC under current chairmanship, reflecting a sovereignty and political economy calculus that prioritizes privacy concerns and legislative authorization constraints over rapid CBDC deployment [36].
- European Union: The ECB is explicitly sequencing technical readiness alongside legislative progress, indicating that sovereignty objectives are being pursued through a regulated scheme and rulebook approach rather than rapid issuance [10].

The core policy implication is that efficiency is not neutral. The lowest cost architecture often centralizes governance and creates dependency on whoever operates the rails, sets the rulebook, and controls access to liquidity.

5.4. Sovereignty implications of programmable money and CBDC rails

Programmable money changes sovereignty from a primarily legal construct into an operational and technical construct. Control is exercised through code mediated policy, platform governance, and access permissions

- Policy execution at settlement layer: If rules such as sanctions screening, transaction limits, or purpose bound transfers are enforced at or near settlement, the state can increase compliance effectiveness and reduce reliance on private intermediaries. However, this also increases the consequences of design errors and creates new systemic cyber and operational risks.
- Extraterritorial reach and counter reach: A CBDC corridor can become a channel for exporting domestic compliance expectations, but it can also become a channel through which foreign jurisdictions demand data, impose participation conditions, or require alignment with their standards.
- Programmability and contestability: Programmability can enable targeted policy tools, but it also raises governance questions about who can update rules, how disputes are resolved, and how to prevent politicized or discriminatory controls.
- Offline and resilience features: Sovereignty is strengthened when domestic payment continuity is possible during network outages or geopolitical disruption. European policy debate has emphasized online and offline capability as part of resilience and sovereignty framing [37].

A practical sovereignty test for cross border CBDC design is whether a country can do all of the following without foreign permission

- Onboard domestic users and institutions using domestic identity and legal standards.
- Set and change compliance rules with transparent governance and due process.
- Maintain operational continuity if a foreign connector is withdrawn.
- Access liquidity and settlement finality without dependence on a foreign central bank or foreign controlled platform.

mBridge and similar multi CBDC platforms illustrate both sides. They can reduce settlement time dramatically, but they also require shared governance and technical alignment among participating central banks, which can constrain unilateral policy choices [25].

5.5. Shifting power dynamics among central banks, private sector, and international institutions

CBDC pilots shift power away from balance sheet intensive intermediation and toward rule setting, platform operation, and compliance execution.

- Central banks: They gain leverage through direct influence over settlement rails, access tiers, and potentially pricing of core services. They also inherit greater responsibility for operational resilience and for cross border governance outcomes.
- Private sector banks and PSPs: Their role shifts from being the primary locus of settlement and compliance to being regulated access providers, liquidity managers, and user experience layers. Large institutions with scale can benefit, while smaller institutions risk becoming dependent resellers.
- Technology and infrastructure providers: Vendors that supply ledger platforms, identity systems, wallet stacks, and compliance engines can become structurally important, creating new concentration risks and new forms of vendor lock in.
- International institutions and standard setters: Bodies driving cross border payment targets and governance guidance increase their influence because interoperability requires shared definitions, metrics, and oversight frameworks. The G20 roadmap and its end 2027 targets create a common performance benchmark that can indirectly pressure domestic policy choices [2].

Strategic tension points likely to define the next phase

- Governance of shared platforms: Multi CBDC arrangements require decisions on rule changes, dispute resolution, and participant offboarding. These are inherently political decisions with financial stability implications.
- Sanctions and corridor access: As payment rails become more programmable, corridor access can be tightened or expanded quickly, increasing the geopolitical value of being a rule setter rather than a rule taker.
- Private stablecoin competition: Where governments do not issue retail CBDC, private stablecoins and tokenized deposits may capture payment flows, potentially shifting monetary and supervisory influence toward private issuers and their home jurisdictions. China has signaled sensitivity to private stablecoin initiatives that could challenge central bank control, as reflected in reporting on Beijing interventions affecting private sector stablecoin plans in Hong Kong [38].

Net assessment: Margin compression is real, but it is not the strategic endpoint. The decisive question for sovereigns is whether the new margin layer, defined by interoperability governance, compliance execution, identity, and liquidity orchestration, is captured by domestic institutions under domestic law, or by foreign platforms and standards that embed external leverage into everyday cross border commerce.

6. Scenario Analysis: 2030 Cross-Border Payment Architectures

By 2030, cross border payment architectures are likely to be defined less by a single dominant rail and more by how jurisdictions choose to package three layers into enforceable corridors

- Messaging and data standards that determine what information travels with value and how compliance is automated.
- Settlement assets and liquidity access that determine who can settle in central bank money and at what price.
- Governance and legal enforceability that determine whose rules apply when systems interoperate.

Across all scenarios, the strategic margin reset described in earlier sections continues, but the margin migrates toward connector governance, compliance attestation, identity and credentialing, and privileged access to CBDC liquidity windows. The scenarios below are not mutually exclusive globally, but they are mutually exclusive within a given corridor at a given time, which is where governments will experience the sharpest trade offs.

6.1. Scenario A: Multilateral interoperable CBDC network (e.g., ISO-based connectors, Swift gateway) — feasibility and trajectory

A multilateral interoperable CBDC network is feasible by 2030 if interoperability is treated as a governance problem first and a technology problem second. The most plausible trajectory is not a single global ledger, but a network of domestic ledgers connected through standardized messaging, harmonized data requirements, and controlled gateways that preserve jurisdictional perimeter controls.

Feasibility drivers

- Data standard convergence: ISO 20022 adoption in cross border payments has moved from optional modernization to operational necessity, with the end of the SWIFT cross border coexistence period for bank to bank payment instructions on November 22, 2025, and a continued push toward structured data and harmonized requirements through the G20 program timeline to end 2027 [39].
- Connector model maturity: SWIFT has already progressed from sandbox experiments to beta testing of a CBDC connector intended to interlink CBDC systems while leveraging existing financial institution connectivity, which supports a gateway based interoperability path rather than a wholesale replacement of incumbent networks [30].
- Regulatory pressure for payment transparency: FATF revisions to Recommendation 16 increase expectations for consistent originator and beneficiary information and clarify responsibilities across the payment chain, pushing the ecosystem toward standardized data fields that can be embedded into CBDC and tokenized settlement connectors [17].

Constraints and failure modes

- Governance fragmentation: Even with ISO 20022, interoperability fails if legal enforceability, liability allocation, dispute resolution, and sanctions compliance are not aligned. A connector can move messages and even trigger settlement, but it cannot resolve conflicts over whose compliance decision is final.
- Access tiering disputes: Multilateral networks will face recurring disputes over which foreign institutions can hold or access CBDC liquidity, under what caps, and with what surveillance and data localization obligations.
- Privacy and data protection conflicts: The more compliance is embedded at the protocol layer, the more cross border interoperability becomes a negotiation over data minimization, retention, and lawful access.

Strategic trajectory to 2030

- 2026 to 2027: Interoperability expands through controlled pilots and limited corridors, with ISO 20022 harmonization reducing friction for shared compliance data models.

- 2028 to 2030: A multilateral network becomes realistic only for aligned jurisdictions that can agree on shared rulebooks and reciprocal enforcement, with SWIFT style gateways and ISO based connectors acting as the practical integration layer.

Implications for margins and control

- Margins compress in correspondent banking and reconciliation, but reappear as fees for gateway access, credential issuance, compliance attestations, and privileged liquidity routing.
- Sovereign leverage increases for participants that can set connector admission rules and define the minimum compliance payload required for settlement finality.

Country example anchors

- European Union: The ECB has stated an aim to be ready for a potential first issuance of a digital euro during 2029, assuming EU co legislators adopt the digital euro regulation in the course of 2026, implying that by 2030 the EU could be operating a mature retail CBDC platform that can be selectively connected to external corridors [22].
- Hong Kong: Participation in SWIFT connector testing and multi jurisdiction pilots positions Hong Kong as a likely gateway jurisdiction that can intermediate between different compliance regimes while maintaining high standards of financial integrity [30].

6.2. Scenario B: Fragmented geoeconomic CBDC blocs (e.g., regional digital currencies, mBridge divergence) — implications for trade and finance

A fragmented bloc outcome is plausible if geopolitical alignment, sanctions risk, and data sovereignty concerns dominate efficiency objectives. In this scenario, CBDC corridors form around regional trade and finance groupings, with limited interoperability across blocs and deliberate redundancy to reduce dependence on rival infrastructure.

Why fragmentation is structurally likely

- CBDCs increase the ability to enforce perimeter controls at the settlement layer, which makes them attractive tools for sanctions compliance, capital controls, and industrial policy.

- Interoperability creates shared attack surfaces and shared governance, which becomes politically unacceptable when trust is low.

mBridge as a template for bloc capable infrastructure

- Project mBridge reached minimum viable product stage in mid 2024, with founding participation from the Bank of Thailand, Central Bank of the United Arab Emirates, the Digital Currency Institute of the People's Bank of China, and the Hong Kong Monetary Authority, and with the Saudi Central Bank joining in 2024 [25].
- The BIS describes the platform as enabling real time peer to peer cross border payments and foreign exchange transactions on the mBridge Ledger, with governance and legal framework work including a rulebook tailored to the decentralized nature of the platform [25].

Trade and finance implications

- Corridor specific liquidity pools: Trade settlement becomes cheaper and faster within blocs that share CBDC rails, but liquidity becomes more siloed across blocs, increasing basis risk and hedging costs for firms operating globally.
- Standards divergence as a strategic tool: Blocs may adopt ISO 20022 for external messaging while embedding additional proprietary compliance fields or credential requirements for internal settlement, creating de facto non tariff barriers in payments.
- Sanctions and counter sanctions dynamics: Fragmented blocs reduce the reach of any single sanctions regime within aligned corridors, but increase the probability of secondary sanctions and compliance over blocking at bloc boundaries.
- Financial stability trade offs: Faster settlement reduces counterparty exposure within a bloc, but fragmentation can amplify stress during crises if liquidity cannot be mobilized across blocs.

Margin reset under fragmentation

- Margins compress inside bloc corridors due to fewer intermediaries and shared infrastructure.
- Margins increase at bloc boundaries due to compliance duplication, restricted access, and the need for specialized intermediaries that can legally operate across regimes.

Country example anchors

- China and Gulf corridor logic: The participation of the People's Bank of China digital currency institute and the UAE central bank in mBridge, alongside Saudi participation, illustrates how trade linked regions can build settlement corridors that reduce reliance on traditional correspondent pathways for specific flows [25].
- European Union: If the digital euro proceeds toward issuance readiness in 2029, the EU could choose selective corridor interoperability aligned with EU strategic autonomy goals, reinforcing a bloc style approach even while using global messaging standards [22].

6.3. Scenario C: Hybrid ecosystem combining private stablecoins (e.g., GENIUS Act-enabled) and CBDCs — regulatory complexity

A hybrid architecture is likely by 2030 even if CBDCs scale, because private stablecoins can iterate faster, integrate directly into platforms, and provide global reach where CBDC access is restricted. The key question becomes whether stablecoins operate as regulated payment instruments tightly coupled to sovereign rails, or as parallel money like instruments that compete with them.

United States as a leading indicator for regulated stablecoin scaling

- The GENIUS Act was signed into law on July 18, 2025, creating a federal regulatory system for payment stablecoins and requiring 100% reserve backing with liquid assets such as U.S. dollars or short term Treasuries, plus monthly public reserve disclosures [40].
- The law explicitly subjects stablecoin issuers to Bank Secrecy Act obligations and requires technical capability to seize, freeze, or burn payment stablecoins when legally required, which is a direct bridge between programmable private money and sovereign enforcement [40].

Regulatory complexity vectors in a hybrid system

- Dual perimeter compliance: CBDC rails enforce access and compliance at the central bank boundary, while stablecoins enforce compliance at issuer and platform boundaries. Cross border corridors must reconcile which compliance decision is authoritative when a stablecoin is redeemed into CBDC or used as a settlement leg.

- Reserve and redemption jurisdiction: Even with 100% reserves, the location and legal treatment of reserve assets, bankruptcy remoteness, and redemption rights become cross border legal questions that can reintroduce margin through legal structuring and risk premia.
- Travel rule and payment transparency convergence: FATF Recommendation 16 revisions push toward standardized information accompanying cross border payments and clarified responsibilities across the chain, which will apply pressure to stablecoin and tokenized payment models to carry richer identity and beneficiary data [17].
- Illicit finance and uneven implementation: FATF has warned that stablecoin use by illicit actors is increasing and that uneven implementation of standards can amplify risks, which implies that hybrid systems will be judged by weakest link jurisdictions and may face corridor level restrictions [41].

How margins reset in the hybrid scenario

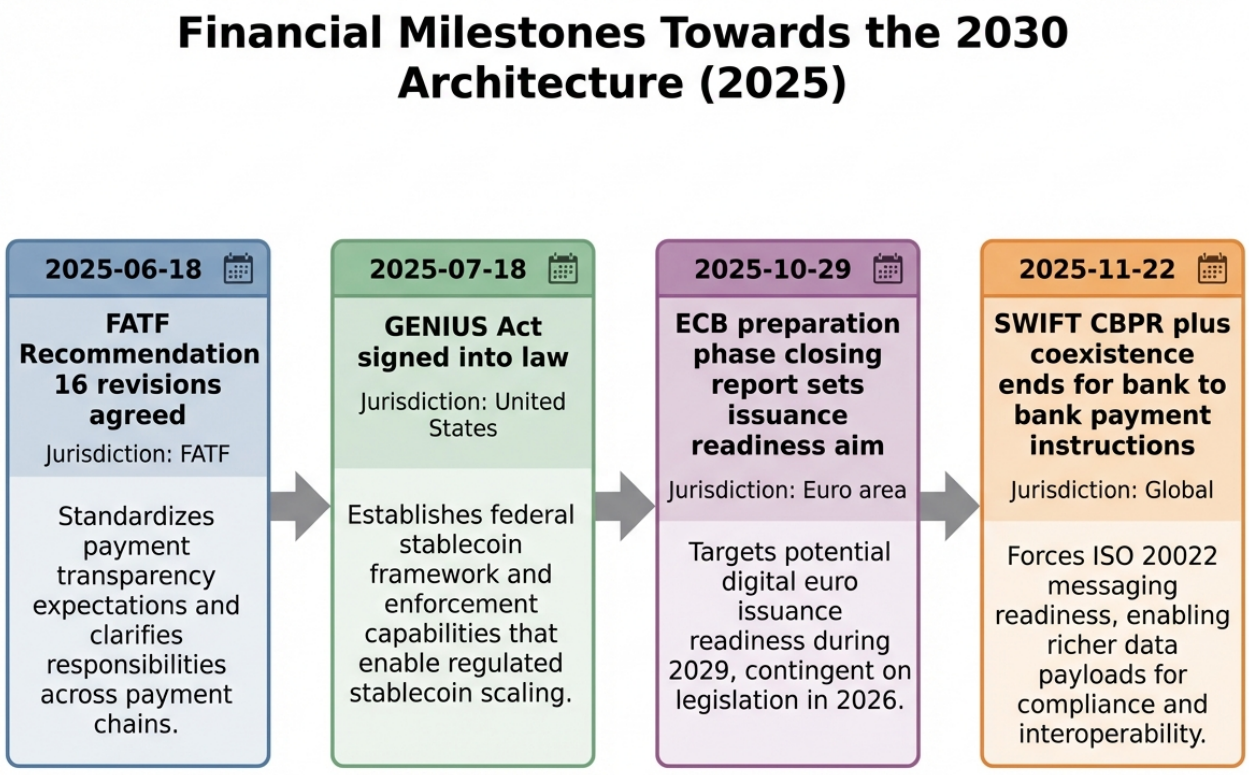
- Stablecoin issuers and distribution platforms capture margin through issuance, redemption, compliance services, and embedded liquidity, while banks and payment firms capture margin through on and off ramps and custody.
- Central banks capture margin indirectly by setting redemption eligibility, access pricing, and compliance requirements for stablecoin to CBDC conversion, effectively taxing interoperability.

Country example anchors

- United States: A regulated stablecoin regime with explicit freeze and burn capability creates a pathway for stablecoins to function as exportable dollar payment instruments, potentially extending dollar influence in corridors where a U.S. retail CBDC does not exist or is politically constrained [40].
- European Union: If the digital euro proceeds, EU policymakers may face pressure to define whether regulated stablecoins can serve as front end instruments that settle into central bank money, or whether they are treated as competing private money requiring tighter constraints.

Title: Selected regulatory and standards milestones shaping hybrid and CBDC interoperability outcomes

Milestone	Date (YYYY-MM-DD)	Jurisdiction or body	Relevance to 2030 architecture
GENIUS Act signed into law	2025-07-18	United States	Establishes federal stablecoin framework and enforcement capabilities that enable regulated stablecoin scaling.
SWIFT CBPR plus coexistence ends for bank to bank payment instructions	2025-11-22	Global	Forces ISO 20022 messaging readiness, enabling richer data payloads for compliance and interoperability.
FATF Recommendation 16 revisions agreed	2025-06-18	FATF	Standardizes payment transparency expectations and clarifies responsibilities across payment chains.
ECB preparation phase closing report sets issuance readiness aim	2025-10-29	Euro area	Targets potential digital euro issuance readiness during 2029, contingent on legislation in 2026.



Source: White House fact sheet on GENIUS Act [40], SWIFT ISO 20022 migration update [42], FATF Recommendation 16 update [17], ECB digital euro preparation phase closing report [22].

6.4. Key indicators to monitor: pilot outcomes, legislation (e.g., digital euro vote June 2026), interoperability standards

Indicators that most strongly predict which 2030 scenario dominates in a given corridor

- Legislative convergence on CBDC issuance mandates and privacy design: The ECB has stated a working assumption that EU co legislators adopt the digital euro regulation in the course of 2026, which is a key gating factor for a 2029 issuance readiness target [22].

- Political signaling in the European Parliament: As of February 10, 2026, the European Parliament is set to vote on an ECB annual report containing a passage supporting the digital euro, which has no legislative effect but provides a public signal of political support levels [43].
- Multi CBDC platform operationalization: Whether mBridge transitions from MVP to sustained corridor usage with real value settlement at scale, and whether governance and legal frameworks are adopted by additional participants, will indicate whether bloc style settlement networks are becoming durable [25].
- Interoperability connector adoption: Expansion of SWIFT style CBDC connector testing from beta into production grade services would support Scenario A by lowering integration costs for banks and central banks [30].
- ISO 20022 harmonization governance: BIS CPMI commitment to maintain harmonized ISO 20022 data requirements through end 2027 and to establish governance panels is a leading indicator of whether data layer convergence will persist long enough to support multilateral interoperability [39].
- Stablecoin rulemaking and enforcement practice: The GENIUS Act creates a framework, but the market impact depends on implementing regulations, supervisory posture, and cross border recognition of U.S. compliant stablecoins as acceptable settlement instruments [40].
- Illicit finance metrics and policy reaction: FATF reporting that stablecoin use by illicit actors is increasing implies that enforcement actions and de risking could rapidly reshape corridor availability, affecting whether hybrid systems expand or are constrained [41].

6.5. Timeline of pivotal decision points for governments and central banks through 2030

The timeline below highlights decision points that determine whether a jurisdiction captures the new margin layer through governance and standards, or cedes it to external connectors and private issuers.

2026

- European Union: Co legislator progress on the digital euro regulation is a gating decision for the ECB stated issuance readiness aim during 2029 [22].

- Global: Post November 2025 ISO 20022 enforcement and contingency translation pricing decisions by network operators and major banks will determine whether structured data becomes universal in practice or remains uneven, affecting compliance automation and interoperability costs [42].

2027

- Global: BIS CPMI and industry governance of harmonized ISO 20022 data requirements through end 2027 is a key inflection point for whether multilateral interoperability remains technically and operationally tractable [39].
- Euro area: ECB indicated that pilot exercise and initial transactions could start as soon as mid 2027 to prepare for potential issuance, which would create early evidence on cross border design choices and connector strategy [22].

2028

- Corridor governance: Jurisdictions decide whether to formalize reciprocal recognition of compliance credentials and identity frameworks for CBDC and tokenized settlement, or to require local re screening at every boundary.

2029

- Euro area: ECB aims to be ready for a potential first issuance of the digital euro during 2029, which would shift the EU from pilot posture to operational posture and force concrete decisions on cross border access and interoperability [22].

2030

- FATF implementation horizon: FATF states that Recommendation 16 changes will come into effect by end 2030, making payment transparency requirements a hard constraint on any cross border architecture, including CBDC connectors and stablecoin rails [17].

Strategic planning implication

- Governments should treat 2026 to 2027 as the window to lock in connector governance, data requirements, and cross border legal enforceability, because by 2029 to 2030 the architecture will be constrained by operational CBDC deployments and binding payment transparency standards, leaving less room to renegotiate who captures the new margin layer.

7. Policy Implications for Governments

CBDC pilots are shifting cross border payments from a bank mediated margin stack toward a protocol mediated margin stack. For governments, the policy implication is that efficiency gains and margin compression are inseparable from new control points such as access rules, identity and data standards, interoperability governance, and settlement finality. The central policy task is to prevent these new control points from being captured offshore or by lightly regulated intermediaries, while still meeting international objectives for faster, cheaper, more transparent cross border payments by end 2027 under the G20 roadmap led by CPMI and partners [20].

7.1. Regulatory frameworks for CBDC deployment and cross-border integration

Governments should treat CBDC deployment as a market structure reform, not a payments product launch. The regulatory framework should explicitly define the perimeter of regulated activity across issuance, distribution, wallet provision, interoperability services, and cross border FX and liquidity functions.

Key framework elements to implement or update

- Monetary law and central bank mandate: Clarify legal authority to issue a CBDC, define its legal tender status if applicable, and specify whether the CBDC is a direct claim on the central bank and how finality is achieved in law.
- Licensing and supervision of intermediaries: Create a tiered licensing regime for wallet providers, payment interface providers, and cross border gateway operators, with clear obligations for operational resilience, cyber security, safeguarding, and consumer protection.
- Data and messaging standards as regulatory infrastructure: Mandate alignment with harmonised ISO 20022 data requirements for cross border payments, including governance for consistent implementation across domestic payment

systems and any CBDC connectors. CPMI has published harmonised ISO 20022 data requirements and is maintaining governance through end 2027, including a panel of global market practice groups to support maintenance [39].

- AML CFT and payment transparency integration: Update AML CFT rules to reflect that CBDC rails can embed compliance closer to settlement. FATF has revised Recommendation 16 on payment transparency, including standardised information requirements for certain cross border payments above USD 1,000 or EUR 1,000 and clarified responsibilities along the payment chain, with changes coming into effect by end 2030 [17].
- Cross border corridor governance: Require that any cross border CBDC linkage or multi CBDC platform has a documented governance and oversight model, including dispute resolution, incident management, and supervisory cooperation. This aligns with CPMI work on governance and oversight for cross border interlinking arrangements, which highlights the multi jurisdictional complexity of such arrangements [19].

Country examples that illustrate regulatory posture choices

- European Union: The Eurosystem moved to a next phase of the digital euro project in October 2025, aiming for technical readiness and indicating that if legislation is adopted in the course of 2026, a pilot exercise could start as of mid 2027, with readiness for potential first issuance during 2029. This sequencing shows a governance first approach where cross border integration is conditioned on legislative clarity and rulebook development [22].
- Multi jurisdiction pilots: Project mBridge reached minimum viable product stage in mid 2024, involving multiple central banks and commercial banks on a shared DLT platform for cross border payments and settlement. This underscores that cross border CBDC integration is already occurring through consortium governance models that require explicit supervisory and legal alignment, not just technical interoperability [25].

Implementation guidance for governments

- Establish a single accountable authority for CBDC perimeter decisions, with formal coordination across central bank, AML authority, data protection regulator, competition authority, and financial stability bodies.

- Require that any CBDC cross border connector or gateway be subject to a designated oversight regime similar in rigor to systemically important payment systems, including audit rights and enforceable service level obligations.
- Publish a cross border CBDC rulebook baseline that specifies minimum data fields, identity assurance levels, sanctions screening responsibilities, and settlement finality rules, and require any private sector integration to conform.

7.2. Defensive architectures to mitigate regulatory arbitrage risks

CBDC pilots create new arbitrage surfaces because interoperability can allow actors to route around the strictest rule set. Defensive architecture should therefore combine technical controls, supervisory controls, and governance controls.

Defensive design principles

- Policy anchored interoperability: Permit cross border interoperability only through approved gateways that enforce domestic policy requirements on identity, data, and compliance. Avoid open ended bridge models that allow uncontrolled connector proliferation.
- Identity and credential hardening: Use verifiable credentials and tiered identity assurance so that higher risk cross border functions such as FX conversion, higher value transfers, and programmable conditional payments require stronger identity and source of funds attestations.
- Compliance by construction: Embed FATF aligned payment transparency requirements into message schemas and ledger metadata, with cryptographic integrity controls to prevent stripping or mutation of required fields across hops. FATF has clarified responsibilities for ensuring required information remains unchanged along the payment chain under revised Recommendation 16 [17].
- Controlled programmability: Constrain smart contract capabilities for cross border use cases through allowlists, audited templates, and runtime policy checks. This reduces the risk that programmable features become a tool for sanctions evasion or disguised beneficial ownership.
- Settlement finality and rollback governance: Define when a cross border CBDC transfer is final, who can freeze or reverse, and under what legal process. Ambiguity here is a prime arbitrage vector.

Supervisory and market monitoring controls

- Gateway level telemetry: Require real time reporting from cross border gateways on corridor volumes, failed compliance checks, and liquidity stress indicators, with standardized reporting formats.
- Arbitrage stress testing: Conduct red team exercises that simulate connector based perimeter hopping, tier arbitrage, and data model arbitrage across corridors.
- Stablecoin and tokenized deposit perimeter alignment: Where private stablecoins interact with CBDC rails, apply consistent oversight to prevent migration of activity to the least regulated instrument. The FSB has highlighted that uneven implementation of its crypto asset and stablecoin recommendations creates opportunities for regulatory arbitrage and complicates oversight [44].

Operational resilience as a defensive layer

- Require cross border CBDC operators and gateways to meet high availability and cyber resilience requirements, including incident reporting and coordinated recovery playbooks.
- Treat interoperability components such as bridges, FX liquidity modules, and compliance oracles as critical infrastructure subject to independent assurance.

Country example

- Multi CBDC platforms such as mBridge demonstrate that shared infrastructure can reduce settlement frictions but also concentrates operational and governance risk. Governments participating in such platforms should require enforceable governance for access control, auditability, and incident response across all participants, not voluntary coordination [25].

7.3. Margin governance: balancing efficiency, control, and financial stability

Margin compression is not purely a consumer benefit story. It is a redistribution of rents from correspondent banking and opaque FX spreads toward new margin layers such as access to CBDC liquidity, interoperability services, compliance attestations, and programmable payment features. Governments should explicitly govern these new margin layers to avoid destabilizing bank funding, creating new monopolies, or exporting strategic leverage.

Policy objectives to balance

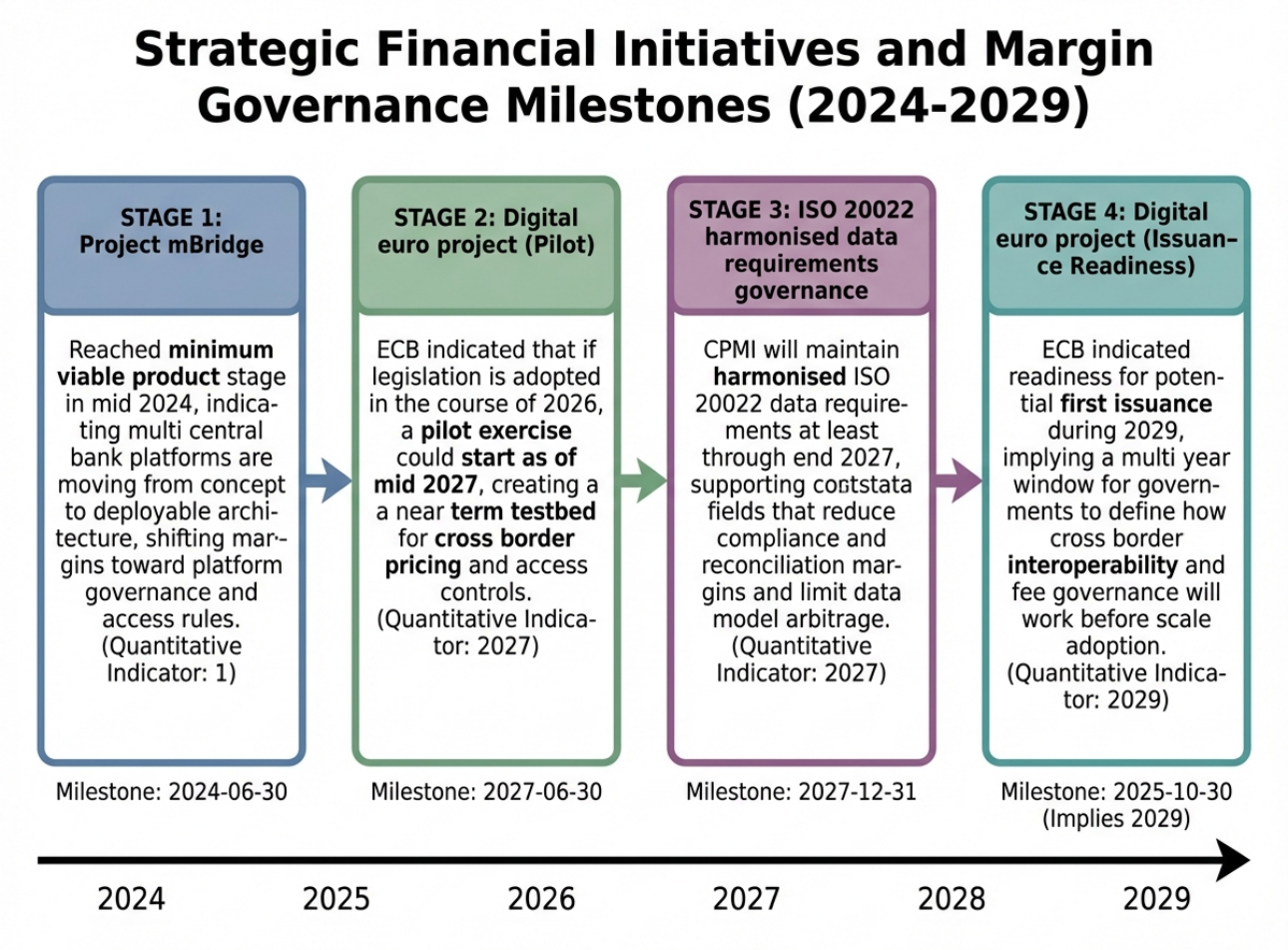
- Efficiency: Reduce trapped liquidity, reconciliation costs, and time to finality, consistent with the G20 cross border payments targets for end 2027 improvements in cost, speed, transparency, and access [20].
- Control: Preserve the ability to enforce sanctions, capital flow measures where applicable, and AML CFT obligations without creating a surveillance overreach that undermines adoption.
- Financial stability: Avoid sudden disintermediation of bank deposits, destabilizing short term funding markets, or creating procyclical liquidity dynamics through always on settlement.

Margin governance levers

- Access pricing and tiering: Set transparent rules for who can access wholesale CBDC liquidity and at what price, including whether non banks can access directly or only via supervised intermediaries.
- FX and liquidity module oversight: If AMM style FX mechanisms are tested or deployed, treat them as regulated market infrastructure with governance over pricing, liquidity provision, and manipulation controls. BIS Project Mariana demonstrated technical feasibility of AMMs for cross border FX trading and settlement of hypothetical wholesale CBDCs, highlighting that new margin layers can emerge at the protocol level [9].
- Competition policy for gateways: Prevent a small number of gateway operators from capturing the new margin layer through exclusive access to interoperability rails or proprietary compliance tooling.
- Bank funding safeguards: Use holding limits, remuneration tiers, or distribution models that reduce the risk of large scale deposit flight during stress, while still enabling cross border use cases.
- Transparency of total cost: Require end to end disclosure of fees and FX spreads across CBDC corridors, including gateway fees and compliance service charges, to prevent hidden margin reconstitution.

Title: Selected public milestones relevant to cross border CBDC margin governance

Initiative or standard	Milestone date (YYYY-MM-DD)	Quantitative indicator (Numeric)	What it implies for margin governance
Project mBridge	2024-06-30	1	Reached minimum viable product stage in mid 2024, indicating multi central bank platforms are moving from concept to deployable architecture, shifting margins toward platform governance and access rules.
Digital euro project	2025-10-30	2029	ECB indicated readiness for potential first issuance during 2029, implying a multi year window for governments to define how cross border interoperability and fee governance will work before scale adoption.
Digital euro project	2027-06-30	2027	ECB indicated that if legislation is adopted in the course of 2026, a pilot exercise could start as of mid 2027, creating a near term testbed for cross border pricing and access controls.
ISO 20022 harmonised data requirements governance	2027-12-31	2027	CPMI will maintain harmonised ISO 20022 data requirements at least through end 2027, supporting consistent data fields that reduce compliance and reconciliation margins and limit data model arbitrage.



Source: BIS on mBridge MVP stage [25], ECB press release on next phase and timeline [10], BIS CPMI on ISO 20022 governance through end 2027 [39].

Practical recommendations

- Create a margin map for each corridor that identifies who captures value in FX conversion, liquidity provision, compliance attestations, and gateway operations.
- Require that any public sector supported CBDC corridor publish a fee schedule and service level commitments, and subject them to periodic review.
- Establish a financial stability trigger framework that can adjust access tiers, limits, or pricing during stress without undermining legal certainty.

7.4. International coordination versus national sovereignty in CBDC policy

Cross border CBDC policy is a sovereignty trade. Interoperability increases efficiency but also imports foreign rule sets through shared ledgers, shared data models, and shared governance. Governments should coordinate on minimum standards while retaining sovereign control over access, data protection, and enforcement.

Where coordination is strategically necessary

- Data and messaging convergence: Align on ISO 20022 harmonised data requirements to reduce fragmentation and prevent data model arbitrage. CPMI has positioned harmonised ISO 20022 data requirements as a key enabler for cross border payment efficiency and is establishing governance for maintenance and adoption through end 2027 [39].
- AML CFT interoperability: Coordinate on payment transparency expectations and responsibilities along the payment chain, consistent with FATF Recommendation 16 revisions, to prevent corridor shopping for weaker information requirements [17].
- Stablecoin and crypto perimeter: Coordinate implementation of FSB recommendations to reduce regulatory arbitrage between CBDC corridors and private token corridors. FSB has reported significant gaps and inconsistencies in implementation that create arbitrage opportunities [44].

Where sovereignty should be preserved

- Access policy: Each jurisdiction should retain the right to define who can hold and transact in its CBDC, including foreign institutions, non residents, and offshore entities.
- Data localization and privacy: Governments should define what transaction data can be shared cross border, under what legal basis, and with what minimization and retention rules.
- Sanctions and national security controls: Preserve the ability to enforce domestic sanctions and national security restrictions, while recognizing that shared platforms can create governance disputes when participants have divergent foreign policy objectives.

Governance models to manage the trade

- Minimum viable multilateralism: Agree on a narrow set of interoperable standards for data, identity assurance levels, and settlement finality, while allowing national policy modules for access and enforcement.
- Corridor specific compacts: Use bilateral or regional compacts for high volume trade corridors, with explicit governance for dispute resolution and supervisory cooperation.

Country example

- European Union: The ECB has framed the digital euro as supporting monetary sovereignty and reducing dependence on non European payment providers, while sequencing cross border readiness behind legislation and a rulebook. This illustrates a sovereignty first posture that still anticipates eventual interoperability through controlled governance [3].

7.5. Legal and treaty instruments required for cross-jurisdictional CBDC operations

Cross border CBDC operations require legal enforceability across jurisdictions for settlement finality, participant obligations, data sharing, and dispute resolution. Without legal instruments, technical interoperability can increase systemic risk by creating uncertain claims and unenforceable compliance duties.

Core legal instruments governments should develop

- Settlement finality recognition: Bilateral or multilateral agreements that recognize the legal finality of CBDC transfers executed on shared platforms or via connectors, including conflict of laws rules for when ledgers are operated across borders.
- Supervisory cooperation and information sharing MOUs: Formal arrangements that enable routine and emergency information sharing, joint examinations of gateway operators, and coordinated enforcement actions.
- Data sharing agreements: Treaties or executive agreements that specify permissible cross border transfer of payment data, lawful access standards, retention periods, and safeguards consistent with domestic privacy law.

- Mutual legal assistance modernization: Update MLAT processes for digital money contexts to support timely freezing, seizure, and evidentiary access, while preventing informal extraterritorial demands.
- Platform governance charters: For multi CBDC platforms, a binding charter that defines voting rights, onboarding and offboarding rules, audit rights, liability allocation, and exit procedures.

Legal design choices that reduce arbitrage

- Harmonized definitions: Align definitions of wallet provider, gateway operator, and CBDC intermediary to prevent entity structuring that exploits definitional gaps.
- Clear liability allocation: Specify who is liable for compliance failures, data errors, and operational outages across the payment chain, consistent with FATF emphasis on clarity of responsibilities in payment transparency [17].
- Recognition of regulatory outcomes: Where full harmonization is infeasible, adopt mutual recognition frameworks for specific controls such as identity assurance levels or operational resilience certifications, with audit rights to prevent lowest common denominator outcomes.

Country and platform example

- Multi central bank platforms such as mBridge demonstrate that cross border CBDC operations are already being built as shared infrastructures. Governments engaging in such platforms should require treaty level or treaty like commitments on governance, legal finality, and supervisory cooperation before scaling beyond pilot corridors [25].

Implementation checklist for governments

- Map legal touchpoints for each corridor, including finality, insolvency treatment, data protection, and enforcement powers.
- Draft a model cross border CBDC agreement template that can be adapted bilaterally, reducing negotiation time and limiting bespoke loopholes.
- Require that any cross border CBDC pilot include a legal enforceability assessment as a go no go criterion for expansion.

8. Strategic Recommendations

This section translates the report's margin and arbitrage analysis into actionable steps for central banks and regulators. The core objective is to prevent the next margin layer in cross border payments from being captured by foreign governance nodes, lightly regulated connectors, or opaque liquidity providers, while still meeting the G20 and FSB performance targets for cost, speed, transparency, and access.

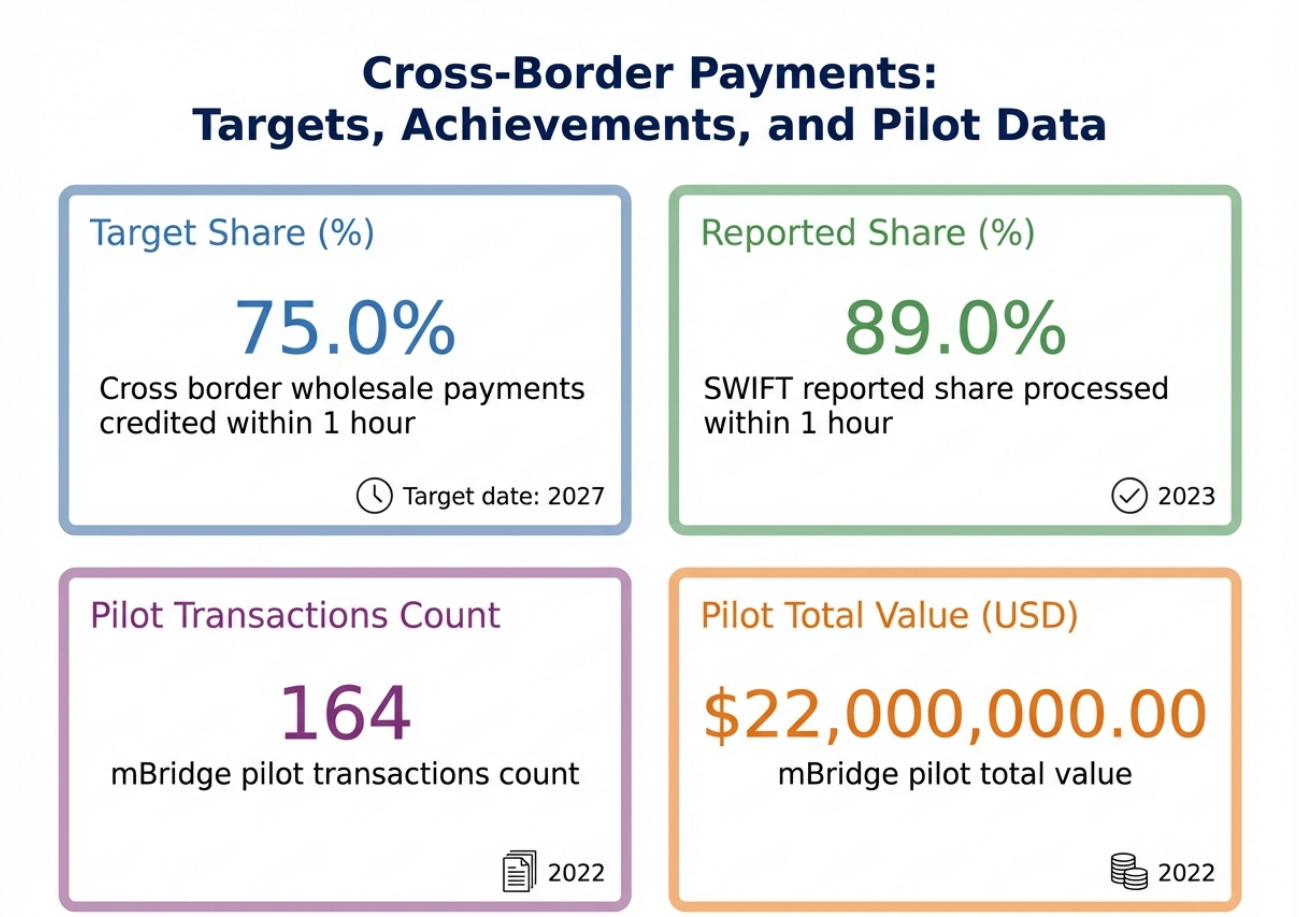
8.1. Immediate actions for central banks and regulators (e.g., sandbox participation, interoperability standards)

- Join or expand participation in multilateral interoperability experiments to avoid being locked out of emerging governance and technical conventions, including BIS Innovation Hub multi CBDC work and SWIFT interoperability sandboxes that test cross network orchestration and atomic settlement patterns [45].
- Treat ISO 20022 harmonisation as a near term sovereign capability, not a compliance exercise, by aligning domestic market practice to CPMI harmonised data requirements and ensuring supervisory expectations for end to end data completeness across corridors [39].
- Establish a CBDC connector licensing perimeter now, covering any entity that routes, transforms, or attests compliance data for cross border CBDC or tokenised money flows, including technical operators of gateways, bridges, and orchestration layers.
- Require pilot participants to implement corridor level transparency for total cost of execution, separating explicit fees from FX spread and liquidity charges, to make margin migration observable and enforceable.
- Implement immediate controls against connector based perimeter hopping by mandating that any cross border CBDC message or token transfer includes a minimum set of originator and beneficiary data aligned to harmonised ISO 20022 requirements, with clear liability for missing or altered fields [18].

- Create a sanctions and access policy playbook for CBDC corridors that specifies how restrictions are applied at the wallet, institution, and transaction levels, and how disputes are handled, to avoid ad hoc fragmentation that invites arbitrage.
- Stand up a joint central bank and supervisor technical cell that can review smart contract logic, AMM pricing logic, and interoperability connector code paths used in pilots, reflecting lessons from AMM based FX experimentation in Project Mariana [9].
- Use procurement and participation criteria to prevent foreign capture of critical nodes by requiring domestic operational control, audit rights, and data residency compliance for any infrastructure that performs compliance screening, identity binding, or liquidity access decisions.

Title: Selected global targets and pilot scale signals relevant to cross border margin reset

Metric	Value	Target date	Source
Cross border wholesale payments credited within 1 hour target share (%)	75.0	2027	[2]
SWIFT reported share processed within 1 hour (%)	89.0	2023	[47]
mBridge pilot transactions count (count)	164	2022	[46]
mBridge pilot total value (USD)	22 million	2022	[46]



Source: Financial Stability Board and SWIFT press releases, and BIS mBridge pilot press release [46].

8.2. Medium-term policy constructs to develop (e.g., margin oversight, cross-border CBDC protocols)

- Build a margin oversight regime for cross border digital money that treats governance and liquidity access as regulated economic choke points, including.
- Define regulated margin layers: gateway and connector fees, compliance attestation fees, liquidity access and credit extension fees, FX execution spreads, and programmability service fees.
- Require periodic reporting of effective spreads and fees by corridor and customer segment, with the ability to impose conduct remedies where market power concentrates.

- Develop cross border CBDC protocol agreements that specify enforceable rules for settlement finality, dispute resolution, and liability allocation across jurisdictions, including how errors, reversals, and fraud are handled when atomic settlement is used.
- Standardise access tiering rules across pilots to reduce tier arbitrage, including consistent definitions for eligible institutions, wallet providers, and non bank payment intermediaries.
- Create a supervisory framework for programmable liquidity and AMM based FX execution, including requirements for.
- Model risk governance and independent validation of pricing logic.
- Stress testing of liquidity pools under corridor shocks.
- Circuit breakers and kill switches with clearly defined authority and audit trails.
- Establish a cross border identity and credentialing framework that binds legal identity, licensing status, and sanctions screening outcomes to payment messages and token transfers, using harmonised ISO 20022 data requirements as the minimum data baseline [18].
- Implement a corridor level data governance compact that reconciles privacy, data localisation, and supervisory access, including explicit rules for what data is shared, retained, and inspected, and under what legal process.
- Country examples to operationalise medium term constructs.
- European Union: Align digital euro cross border experimentation with a rulebook and scheme governance that can be extended to cross border use cases, while keeping issuance decisions contingent on legislation and maintaining readiness timelines through 2029 [22].
- China and Gulf corridors: Use mBridge MVP participation to negotiate corridor governance and compliance reciprocity, ensuring that liquidity access and compliance attestations do not become de facto foreign controlled toll booths [48].
- United States: Prepare for a hybrid perimeter where stablecoin regulation advances while CBDC issuance remains politically contested, by ensuring that any tokenised dollar settlement rails used cross border meet equivalent data, sanctions, and margin transparency requirements as bank rails [49].

8.3. Long-term strategic positioning in the global digital currency ecosystem

- Treat cross border CBDC strategy as a geopolitical infrastructure portfolio, where the objective is to secure influence over standards, governance, and liquidity access rather than only reducing transaction costs.
- Invest in sovereign interoperability capabilities that can connect to multiple networks without ceding control, including.
- A national gateway reference architecture that supports multiple settlement assets, including RTGS money, tokenised deposits, and CBDC where applicable.
- A policy controlled rules engine for access, sanctions, and data sharing that can be updated rapidly during crises.
- Pursue governance first multilateralism by prioritising treaty like arrangements on finality, supervision, and dispute resolution before scaling technical interconnection, reducing the risk that technical interoperability becomes irreversible regulatory arbitrage.
- Build strategic redundancy for sanctions and crisis scenarios by ensuring that critical trade corridors have at least two viable settlement pathways, one of which remains under domestic or allied governance.
- Develop a long horizon plan for programmable sovereign money that explicitly allocates who can capture the new margin layer, including.
- Public sector capture: central bank or public utility pricing for core settlement and compliance primitives.
- Regulated private capture: licensed intermediaries providing value added programmability, liquidity, and compliance services under margin oversight.
- Preventing foreign capture: restrictions on foreign controlled connectors and mandatory auditability of cross border rules execution.
- Align domestic payment competitiveness goals with global targets through 2027 while planning for issuance readiness timelines where relevant, such as the Eurosystem objective to be ready for potential first issuance of a digital euro during 2029 subject to legislation [10].

8.4. Public-private collaboration models for CBDC infrastructure and innovation

- Use a layered partnership model that separates public control of monetary and compliance primitives from private innovation at the application layer.
- Public layer responsibilities: issuance, core ledger or settlement asset definition, access policy, and supervisory data rights.
- Private layer responsibilities: wallets, user experience, treasury and liquidity tooling, compliance automation, and programmable payment products.
- Establish regulated connector and gateway markets where private firms can compete on service quality and innovation, but must meet common interoperability and audit standards validated through sandbox testing, reflecting the scale of industry participation demonstrated in SWIFT CBDC sandbox phases [45].
- Create a public procurement and certification pathway for critical components such as identity binding, secure hardware, and policy rules engines, with mandatory third party security evaluation.
- Incentivise private sector development of compliance preserving technologies, including selective disclosure credentials and privacy enhancing audit trails, by offering clear regulatory safe harbours when certified implementations are used.
- For multi CBDC platforms, adopt an open extension model similar to mBridge MVP invitations for value added solutions, but require that extensions cannot alter settlement finality logic or compliance data integrity without central bank approval [48].
- Establish a cross border payments innovation council that includes central banks, supervisors, banks, PSPs, and major corporates, with a mandate to publish corridor level implementation playbooks aligned to CPMI harmonised ISO 20022 data requirements [39].

8.5. Monitoring and evaluation frameworks for pilot outcomes and systemic impact

- Implement a pilot evaluation framework that measures both efficiency outcomes and margin migration outcomes, ensuring that compressed legacy margins are not replaced by opaque protocol or governance rents.
- Define a minimum KPI set for every pilot corridor.

- Speed: time to credit and time to finality, measured end to end.
- Cost: total cost of execution decomposed into fees, FX spread, and liquidity charges.
- Transparency: completeness of harmonised data fields and traceability of intermediaries.
- Access: participation breadth across banks and non banks, and impact on de risking corridors.
- Control: ability to enforce sanctions, access restrictions, and emergency interventions with auditable governance.
- Require pilots to publish a margin waterfall for representative transaction types, showing which entities capture which fees and spreads, and how this changes when atomic settlement or shared ledgers are used.
- Establish systemic risk monitoring for.
- Liquidity concentration in CBDC corridors and AMM pools.
- Operational resilience of connectors and gateways, including single points of failure.
- Cross jurisdiction contagion channels created by shared ledgers.
- Create a governance audit regime for shared platforms that includes.
- Independent verification of policy rules execution.
- Regular penetration testing and code audits for smart contracts and connector logic.
- Incident reporting and coordinated vulnerability disclosure.
- Align evaluation timelines to global milestones, including the G20 and FSB end 2027 targets for cross border payments improvements and CPMI maintenance of harmonised ISO 20022 data requirements through end 2027 [39].
- For jurisdictions with defined CBDC readiness roadmaps, integrate pilot evaluation gates into issuance readiness decisions, such as the Eurosystem sequencing that anticipates a pilot exercise potentially starting mid 2027 and readiness for potential issuance during 2029 subject to legislation [22].

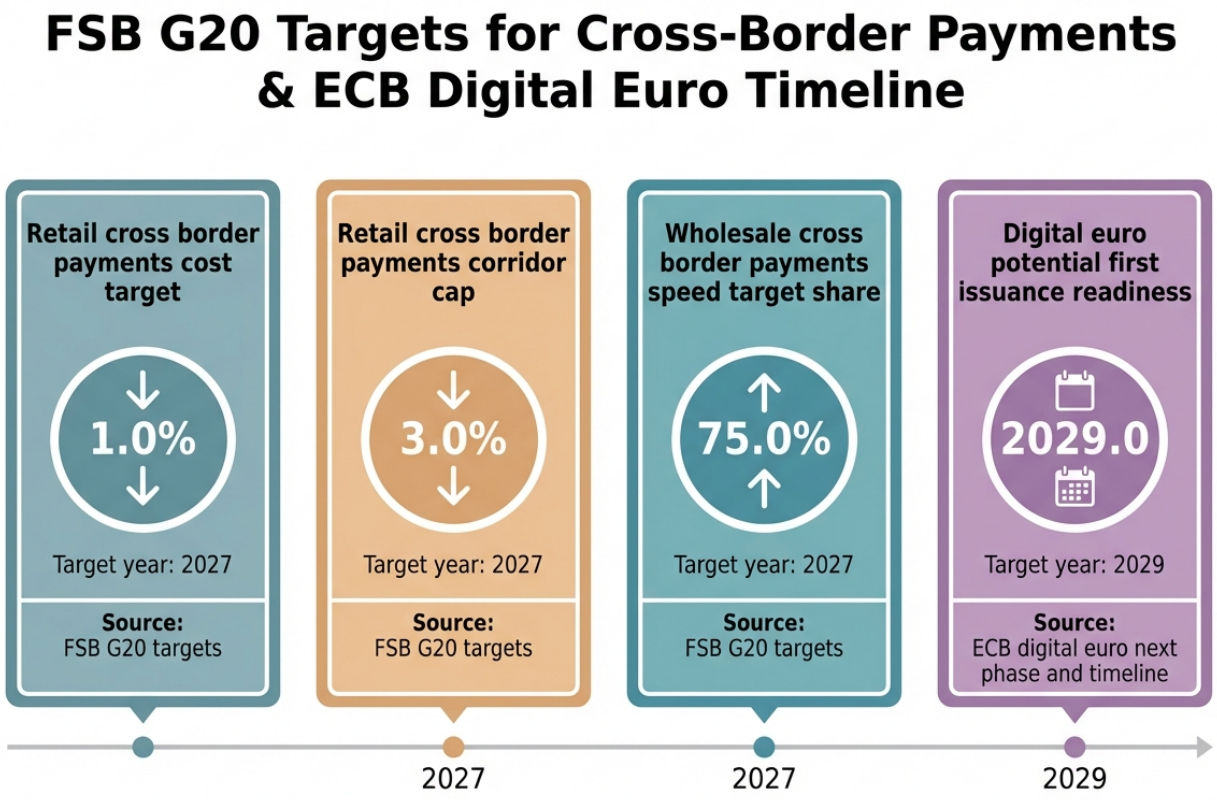
9. Conclusion: The Coming Payment Order

CBDC pilots are no longer best understood as payment modernization projects. They are early market structure reforms that relocate where cross border payment value is created, priced, and governed. The legacy margin stack built around correspondent banking, nostro liquidity, opaque FX execution, and multi jurisdictional compliance is being challenged by architectures that can settle in central bank money with richer data, tighter rule enforcement, and potentially atomic payment versus payment mechanics. As these pilots scale, the strategic contest shifts from reducing fees to controlling the chokepoints that define access, interoperability, and enforceability.

The emerging payment order is therefore not a single global network but a layered and contested set of rails. Some corridors will converge around shared standards and governance, while others will harden into bloc aligned infrastructures. In both cases, the decisive issue for governments is whether the next margin layer is captured by domestic public institutions, regulated domestic intermediaries, foreign platforms, or lightly governed connectors that exploit fragmentation.

Title: Selected public targets and timelines shaping cross border CBDC strategy

Item	Metric	Target year	Source
Retail cross border payments cost target	1.0%	2027	FSB G20 targets [2].
Retail cross border payments corridor cap	3.0%	2027	FSB G20 targets [50].
Wholesale cross border payments speed target share	75.0%	2027	FSB G20 targets [2].
Digital euro potential first issuance readiness	2029.0	2029	ECB digital euro next phase and timeline [10].



Source: Financial Stability Board and European Central Bank publications cited in table.

9.1. Recap of structural shifts and strategic implications

CBDC pilots and adjacent tokenized settlement experiments are shifting cross border payments from a chain of bilateral obligations into architectures that can support shared state, richer data, and tighter coupling between messaging, compliance, and settlement.

Key structural shifts

- Settlement layer shift: Movement from delayed settlement through correspondent chains toward near real time settlement concepts in central bank money, including experiments that combine FX execution and settlement logic in one workflow.

- Data and compliance shift: Movement from post hoc screening and reconciliation toward embedded compliance controls and standardized data models that travel with the payment.
- Intermediation shift: Compression of some legacy margins tied to multi hop routing, trapped liquidity, and reconciliation, alongside the creation of new rents around access to CBDC liquidity, interoperability gateways, and rule enforcement nodes.
- Governance shift: Movement from bank network governance and private rulebooks toward hybrid governance where central banks, regulators, and designated operators define corridor rules, eligibility, and data sharing.

Strategic implications for governments and central banks

- Monetary sovereignty becomes partly infrastructural: Control over domestic money is no longer sufficient if cross border rails are governed abroad or if domestic actors must route through foreign compliance and identity stacks.
- Interoperability becomes a geopolitical choice: Technical compatibility can expand trade and remittance efficiency, but it can also import foreign policy constraints, surveillance expectations, or sanctions exposure.
- The competitive arena moves to protocol economics: The most durable advantage accrues to jurisdictions that can set corridor rules, certify compliant participants, and provide credible settlement finality across borders.

Country examples that illustrate the shift

- European Union: The ECB has moved the digital euro project into a next phase focused on technical readiness, with a working assumption that if legislation is adopted in 2026, a pilot could start in mid 2027 and the Eurosystem could be ready for potential first issuance in 2029, explicitly framing the project as supporting monetary sovereignty and resilience in payments [10].
- China and Hong Kong: The HKMA and PBoC expanded the cross boundary e CNY pilot in Hong Kong, including wallet setup for Hong Kong residents and top ups via Hong Kong FPS, demonstrating how CBDC corridors can be built as controlled interoperability between domestic fast payment systems and sovereign digital money systems [5].

- United States: The policy trajectory remains contested, with public statements emphasizing that a US CBDC would require Congressional authorization, while legislative proposals such as the No CBDC Act illustrate how domestic political constraints can shape cross border positioning even if other jurisdictions proceed [51].

9.2. Emergence of a new margin layer via programmable sovereign money

CBDCs compress some legacy margins, but they also create a new margin layer that is more structural and harder to arbitrage away because it is embedded in the architecture of money itself.

What the new margin layer consists of

- Access pricing to settlement liquidity: Fees, spreads, or collateral requirements for obtaining and using CBDC liquidity in cross border corridors, including intraday liquidity and FX related liquidity provisioning.
- Interoperability and gateway rents: Charges for operating certified connectors, compliance gateways, and message translation layers that bridge domestic systems and cross border platforms.
- Compliance attestation and identity services: Monetization of KYC utilities, credential issuance, transaction policy engines, and auditability services that become mandatory for corridor participation.
- Programmability and conditionality services: Value capture from programmable features such as conditional release, escrow like logic, delivery versus payment integration, and automated reporting.

Why this margin is strategically different

- It is governance backed: Unlike many legacy fees that can be competed down, corridor rules can mandate specific technical and compliance functions, making the margin durable.
- It is concentrated: A small number of nodes can become systemic chokepoints, including identity providers, rulebook operators, and interoperability hubs.
- It is exportable: Jurisdictions that set corridor standards can export their compliance logic and data expectations, turning payment participation into a form of regulatory alignment.

Technical signal from pilots

- Project Mariana demonstrated the technical feasibility of using automated market maker concepts for cross border FX trading and settlement of hypothetical wholesale CBDCs, illustrating how FX execution and settlement could be reorganized around protocol level liquidity and pricing mechanisms rather than dealer centric workflows [9].

Distributional consequences

- Winners: Operators of certified gateways, regulated liquidity providers with privileged CBDC access, and jurisdictions that can set corridor rulebooks.
- Losers: Intermediaries whose margins depend on opacity, multi hop routing, and reconciliation, unless they reposition as regulated gateway operators or liquidity specialists.
- New strategic risk: If foreign platforms or offshore connectors become the default interoperability layer, domestic authorities may lose effective control over the new margin layer even if they retain domestic monetary control.

9.3. Consequences for global financial stability amid geopolitical fragmentation

CBDCs can improve settlement finality and transparency, but in a fragmented geopolitical environment they can also introduce new stability risks that are corridor specific, governance driven, and operationally nonlinear.

Stability benefits that can be real

- Reduced settlement and counterparty risk through faster settlement and better data integrity.
- Improved supervisory visibility if transaction data and compliance artifacts are standardized and accessible under clear legal authority.

Stability risks that become more salient under fragmentation

- Digital corridor runs and liquidity cliffs: If cross border CBDC corridors allow rapid reallocation of liquidity, stress events can propagate faster, especially if access rules change abruptly.

- Policy induced segmentation: Bloc aligned corridors can harden into liquidity silos, increasing basis risk between blocs and raising the cost of hedging and trade finance.
- Operational concentration risk: A small number of interoperability gateways, identity utilities, or rule engines can become single points of failure.
- Sanctions and de risking feedback loops: Corridor governance can embed sanctions compliance closer to settlement, which may improve enforceability but can also amplify sudden stops in payment flows during geopolitical escalation.

Evidence base and monitoring frameworks

- The IMF has emphasized the need for structured assessment of CBDC related financial stability implications, including how design choices affect bank funding, run dynamics, and the broader financial system, underscoring that stability outcomes depend on architecture and policy settings rather than the CBDC label itself [52].

Implication for cross border order

- In a cooperative world, CBDCs can support the G20 cross border payments targets by enabling faster and more transparent settlement pathways.
- In a conflict fractured world, CBDCs can become instruments of selective connectivity, where stability is locally improved inside corridors but globally weakened by segmentation, duplicated infrastructures, and governance disputes.

9.4. Core question for policymakers: who captures the margin in the digital payment era?

The central policy question is not whether cross border payment margins compress. The central policy question is who captures the new margin layer created by programmable sovereign money.

The margin capture contest typically resolves into four archetypes

- State captured margin: The central bank or state designated operator controls key gateways, sets corridor pricing, and embeds compliance logic at the settlement layer.
- Regulated domestic private capture: Domestic banks and payment firms operate gateways and liquidity services under strict licensing, with margin constrained but sustainable.

- Foreign platform capture: Foreign networks provide the interoperability layer, identity stack, or compliance tooling, extracting rents and exporting governance.
- Offshore connector capture: Lightly regulated entities exploit fragmentation and inconsistent corridor rules, monetizing perimeter hopping and compliance arbitrage.

Policy levers that determine the outcome

- Access rules: Who can hold, transact, and provide liquidity in CBDC corridors.
- Interoperability governance: Who certifies connectors, sets technical standards, and controls upgrades.
- Data governance: Where transaction data resides, who can access it, and under what legal process.
- Legal enforceability: Whether settlement finality, dispute resolution, and liability allocation are credible across jurisdictions.

Country positioning signals

- European Union: The digital euro timeline and political framing emphasize sovereignty and resilience, implying a preference to prevent foreign capture of core payment rails and associated rents [10].
- China and Hong Kong: The cross boundary e CNY pilot shows a corridor model where interoperability is permitted but tightly scoped, with tiering and functional constraints that preserve sovereign control over the rail and its data perimeter [5].
- United States: Legislative proposals to prohibit or constrain a retail CBDC indicate that margin capture may shift toward regulated private dollar stablecoin and tokenized deposit models, or toward payment system upgrades, rather than a direct central bank issued retail instrument, with implications for who controls interoperability and compliance tooling [51].

Strategic bottom line

- If governments do not deliberately design for domestic capture of the interoperability and compliance margin layer, they may achieve lower headline fees while losing strategic control over the rails that determine access, surveillance, and sanctions enforceability.

9.5. Directions for future research and monitoring

Governments, regulators, and central banks should treat CBDC pilots as ongoing experiments in market structure and geopolitical connectivity. The research agenda should therefore prioritize measurable indicators of margin relocation, arbitrage emergence, and stability externalities.

Priority research questions

- Margin decomposition under pilots: Quantify how much of the end to end cost moves from FX spreads and correspondent fees into gateway fees, liquidity access pricing, compliance attestation costs, and data services.
- Governance stress testing: Evaluate how corridor rulebooks behave under sanctions escalation, cyber incidents, and liquidity stress, including decision latency for rule changes and the legal enforceability of emergency measures.
- Interoperability risk mapping: Identify where connectors, bridges, and message translation layers create perimeter hopping opportunities, and test how quickly regulators can detect and contain them.
- Data protection and sovereignty trade offs: Compare corridor designs for data minimization, privacy preserving compliance, and lawful access, and assess cross border conflicts of law.
- Financial stability transmission channels: Model how CBDC corridor liquidity and programmability could accelerate runs, amplify procyclicality, or create new forms of settlement gridlock.

Monitoring indicators through 2030

- Standards convergence: Adoption and governance of common data and messaging standards in cross border corridors, aligned with the G20 roadmap targets for cost and speed improvements by end 2027 [2].
- Legislative and institutional readiness: Progress of enabling legislation and operational readiness milestones, such as the ECB stated pathway that assumes legislation in 2026, pilot activity from mid 2027, and readiness for potential issuance in 2029 [10].
- Corridor expansion signals: Growth in cross boundary CBDC use cases that link domestic fast payment systems to CBDC wallets and settlement, as seen in the Hong Kong and Mainland e CNY linkage via FPS top ups [5].

- Stability assessment frameworks: Uptake of structured CBDC stability assessment approaches, including those proposed by the IMF for evaluating design dependent stability impacts [52].

Practical next step for policymakers

- Establish a standing cross border digital money observatory that combines supervisory data, corridor rulebook audits, and market microstructure analytics, with a mandate to report annually on who is capturing the new margin layer and whether that capture aligns with national security, competition, and financial stability objectives.

Author's Profile

Damodara Rao Repalle, Ghost Research

Subject Matter Expert

Damodara Rao Repalle is a seasoned Business Operations Leader with over **35 years of experience**, including **16+ years in senior management positions** across leading manufacturing companies and global MNCs. With a strong foundation in engineering from **BITS Pilani** and advanced professional certifications from prestigious institutions such as **IIM Kozhikode, Wharton, Rutgers, Google, and IBM**, he blends deep operational expertise with modern, data-driven strategic capabilities.

As the **Founder & CEO of S3 Optistart Consulting**, he specializes in **strategic consulting, business planning, financial modelling, market research, corporate governance, and operational efficiency**, helping organizations achieve sustainable, scalable growth through structured and analytical approaches.

His technical and leadership strengths span **AI-enabled business intelligence**, **LEAN/TQM/TPM/WCM/Six Sigma**, **ESG and compliance frameworks**, **P&L ownership**, **large-scale project execution**, and **cross-functional team development**. He holds extensive experience working with renowned companies including **Roca Bathroom Products, H&R Johnson, Saint-Gobain Glass, General Optics (Asia), Omax Autos, and Rane Brake Linings**.

Multilingual and culturally versatile, he communicates fluently in **English, Hindi, Telugu, and Tamil**, with working knowledge of **German and Kannada**.

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