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Cross-Border CBDC Interoperability: Governance Design and Monetary Autonomy

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Abstract

Cross-border central bank digital currency arrangements can retain national currencies while distributing authority over the infrastructure through which public mandates are implemented. This conceptual article examines how decision-right allocation shapes the durability of policy-implementation capacity in cross-border wholesale arrangements. Through purposive theoretical synthesis, it integrates comparative institutional economics, incomplete-contract reasoning, network-power analysis, and monetary-sovereignty scholarship. Interlinked systems and shared multicurrency platforms provide comparison settings for examining authority over access, rule changes, liquidity, and emergency intervention. The framework connects these allocations to implementation through policy–infrastructure alignment, conditioned by operational dependence, enforceability, review procedures, and resource availability. Four propositions address coordination, dependence, safeguards, and emergency authority. Cooperation can expand feasible operations while making continued execution contingent on decisions beyond an individual authority's control. Within the framework, dependence becomes consequential for monetary-policy autonomy when it affects a necessary monetary function, cannot be offset within the relevant horizon, and materially narrows implementable choices relative to a credible alternative. The contribution distinguishes initial technical permissions from durable capabilities through authority over subsequent changes and interventions. Institutional projects illustrate configurations rather than validate the propositions. The framework supports governance assessment of decision responsibilities, modification rights, liquidity commitments, and recovery arrangements by central banks and international monetary institutions.

Keywords: Central Bank Digital Currency; Cross-border interoperability; Governance; Monetary autonomy; Decision rights; Policy implementation.

1. Introduction

Cross-border central bank digital currency (CBDC) interoperability concerns more than the transfer of digital claims. Institutions with different mandates must coordinate eligibility, currency conversion, liquidity, compliance, and legally final settlement. Auer et al. (2021) identify international coordination and early attention to cross-border requirements as important to prospective payment benefits. A joint institutional report similarly emphasizes that access and interoperability choices involve different implications for efficiency, resilience, and inclusion (Committee on Payments and Market Infrastructure, 2022) . These publications establish a conditional design problem rather than the demonstrated superiority of CBDCs over every existing payment arrangement.

Related evidence from private digital-finance markets illustrates why technical availability should not be treated as a complete explanation of participation. Reviewing 120 studies, Ram & Arulmurugan (2026) identify social factors as facilitators of cryptocurrency adoption and fluctuations as an impediment. These findings concern cryptocurrency participation, not CBDC governance; they do not establish institutional mechanisms for public monetary infrastructure. The distinction motivates an appropriately bounded question here: beyond the availability of digital instruments, what arrangements permit public authorities to implement their legally assigned responsibilities through cross-border systems?

Experimental projects make the institutional question concrete. Project Dunbar developed prototypes of a common platform for multiple CBDCs and identified access, jurisdictional boundaries, and governance as central challenges (BIS Innovation hub, 2022). Project Meridian FX explored synchronised settlement across experimental wholesale infrastructures, including RTGS-to-DLT connections (BIS Innovation hub, 2025). Project Agorá combined tokenised commercial bank deposits and central bank reserves in a shared-platform prototype (BIS

Innovation hub, 2026) . These projects involve different claims, objectives, and experimental settings. Their capabilities cannot be treated as equivalent evidence of mature operating performance, cost reductions, or an optimal allocation of authority.

The scholarly relationship between interoperability and sovereignty is already established as a research problem.

Themistocleous et al. (2023) distinguish technical feasibility from legal and institutional challenges. Chu and Rathbun (2025) compare interoperability models through capital-flow management, including the capacity of common-platform designs to implement jurisdiction-specific measures. Chey (2026) emphasizes heterogeneous national CBDC objectives and the international cooperation required for wholesale networks. Building on existing research on CBDC interoperability and monetary sovereignty, this article develops a decision-rights framework to explain how governance arrangements shape the durability of policy-implementation capabilities in cross-border wholesale CBDC systems. Its central contribution is to distinguish capabilities available at entry from those that remain executable through subsequent rule changes, institutional disagreements, and operational disruptions. The framework identifies how authority over modification, intervention, and review conditions this durability, and specifies when constraints on implementation become consequential for monetary-policy autonomy.

The narrower question concerns the durability of policy capabilities after participation begins. An authority may retain its currency and legal mandate while depending on another institution for a permission change, settlement continuity, or foreign-currency liquidity. Conversely, shared rules may make a previously difficult policy easier to execute. A capability demonstrated at launch need not remain equally accessible after a software revision, a change in participant eligibility, or an operational emergency. The institutional problem is consequently dynamic: the rights that govern adaptation can matter as much as the permissions initially configured.

This article asks how the allocation of decision rights in cross-border wholesale CBDC arrangements shapes policy-infrastructure alignment and effective policy-implementation capacity. It distinguishes monetary-policy autonomy from regulatory discretion and infrastructural control. It does not infer lost interest-rate independence from every operational dependency, nor assume that retaining separate currencies necessarily preserves all relevant powers. The connection to monetary autonomy must be established through an identifiable policy function, such as liquidity distribution or the execution of a legally assigned monetary operation. The proposed contribution is a decision-rights and policy-implementation model. It explains a sequence from governing authority through task-specific alignment to practical implementation, conditioned by dependence, enforceability, review, and resources. Interlinked systems and shared platforms provide comparison settings, not predetermined rankings. Four propositions identify relationships for subsequent institutional, comparative, and empirical investigation. The paper first explains its conceptual method and definitions, then develops the literature-based mechanisms, compares architectures, presents the model, examines counterarguments, and derives bounded implications for public authorities.

2. Methodology

2.1. Research design and analytical objective

This article adopts a conceptual model-development approach supported by purposive theoretical synthesis. Its objective is to explain how the allocation of decision rights within cross-border wholesale central bank digital currency (CBDC) arrangements may shape coordination processes and the implementation of authorized operations. It does not estimate causal effects, measure national monetary autonomy, or establish the superiority of a particular technical architecture. Following Jaakkola (2020), the research design makes explicit the concepts selected, the explanatory contribution of each theoretical perspective, and the reasoning through which propositions are developed. The unit of analysis is a specified policy-implementation task within a cross-border arrangement rather than an entire jurisdiction or payment platform. Examples include changing participant eligibility, implementing a currency-specific restriction, or restoring an operation following disruption. This task-level focus permits the analysis to distinguish legally assigned authority from the institutional processes and resources required to exercise it. Implications for monetary autonomy are considered only where the affected operation can be connected to an identified monetary-policy responsibility.

2.2. Literature selection and evidentiary roles

The literature was assembled through targeted searches of accessible publisher websites, scholarly repositories, and official institutional publications. Search terms addressed cross-border CBDC interoperability, governance, monetary sovereignty, decision rights, incomplete contracts, network power, liquidity, and operational dependence. Selection was purposive: sources were retained because they supplied a relevant mechanism, clarified an institutional arrangement, identified a counterargument, or established an important boundary to the proposed explanation. The study does not claim exhaustive database coverage or a systematic-review protocol.

The sources perform different evidentiary roles.

Foundational theoretical publications supply explanatory concepts. CBDC scholarship establishes the substantive problem and adjacent contributions. Institutional reports identify design options, operating requirements, and experimental capabilities. These materials are not treated as equivalent forms of evidence. In particular, a prototype demonstration establishes a capability under specified conditions; it does not establish sustained operating performance, crisis effectiveness, or a causal effect on monetary autonomy.

Verification distinguishes publication identity, bibliographic metadata, and support for the accompanying claim. Relevant original texts were examined where accessible; claims relying on official summaries or indexed abstracts were restricted accordingly. Ram & Arulmurugan (2026) for example, provide a contextual finding about cryptocurrency adoption rather than evidence for the CBDC governance propositions.

2.3 Selection and integration of theoretical perspectives

The theoretical perspectives were selected for their complementary explanatory value rather than their general association with finance or institutions. The focal problem requires an account of how cooperation is governed, how decisions are made under changing circumstances, and when institutional dependence becomes consequential. No single selected perspective addresses all three questions.

Comparative institutional economics provides the principal explanation of coordination and adaptation. Williamson (1991) shows why specific investments and consequential disturbances create a need for governance arrangements capable of managing adjustment. Applied here, the relevant concepts are the difficulty of replacing essential services and the procedures through which participants adapt to changing requirements. Markets, hybrids, and hierarchies are not mapped mechanically onto CBDC architectures.

Incomplete-contract reasoning identifies the importance of decisions that cannot be exhaustively specified in advance. Grossman & Hart (1986) distinguish specific rights from residual control. This distinction informs examination of who may act when rulebooks leave ambiguity or when exceptional circumstances arise. The application is interpretive: corporate ownership is not equated with public authority, and formally delegated emergency powers are distinguished from genuinely unspecified discretion.

Network-power analysis explains why dependence does not automatically become coercive control. Farrell & Newman (2019) connect structural network advantages to jurisdiction and institutional capacity. Their contribution directs attention to who can legally use information, restrict access, or exercise exclusionary powers—not merely to whether infrastructure is technically centralized.

Monetary-sovereignty scholarship supplies the boundary between formal powers and available financial resources. Pistor (2017) explains why authority over domestic issuance does not eliminate dependence on foreign liquidity or financial backstops. This perspective prevents the analysis from treating retained currency denomination as sufficient evidence of practical independence.

Together, these perspectives organize the explanation: coordination creates adaptive requirements; incompletely allocated rights affect how those requirements are addressed; dependence and jurisdiction shape participants' exposure to consequential decisions; and financial resources constrain what even a legally authorized actor can implement.

2.4. Construction of the architecture comparison

The comparison uses two ideal types: interlinked sovereign CBDC systems and shared multicurrency platforms. These categories are comparison settings, not mutually exclusive empirical classifications or predetermined governance rankings. Both retain separate monetary units, but they may distribute technical operations and institutional responsibilities differently. The joint institutional report recognizes several access and interoperability options and emphasizes that no model is appropriate for all objectives (Committee on Payments and Market Infrastructure, 2022).

To maintain conceptual comparability, the analysis holds three features constant: wholesale participation, distinct currency issuers, and a cross-border settlement objective. It then examines the allocation of authority across access, rule changes, liquidity responsibilities, information, emergency intervention, and withdrawal or recovery. It does not assume equivalent costs, legal compatibility, technical maturity, or transaction coverage.

For each domain, the comparison asks who establishes the rule, who executes it, who provides resources, who may intervene, and how decisions can be reviewed. Architecture descriptions are therefore translated into institutional questions rather than assigned an autonomy score. Project reports illustrate possible configurations but are not treated as controlled comparative cases. Where public material does not disclose a provision, the analysis records an information limitation rather than concludes that the safeguard is absent.

2.5. Development of mechanisms and propositions

The propositions are developed through a sequence of identifying a decision, specifying the actors and their responsibilities, tracing the coordination process, and considering consequences for an authorized operation. The central explanatory

pathway connects the allocation of decision rights to coordination and adaptation processes, and subsequently to implementation outcomes.

The first connection concerns how authority structures routine instructions, rule changes, escalation, and emergency decisions. The second concerns how those processes enable, delay, restrict, or prevent execution. The framework does not presume that every operation involves a dispute or that lawful restrictions constitute governance failure.

Each proposition requires an explicit theoretical premise, an institutional mechanism, and conditions limiting its application. Proposition 1 addresses the connection between assigned authority and executable coordination. Proposition 2 explains how limited substitution and influence can make mismatches more consequential. Proposition 3 addresses the durability of safeguards when permissions change. Proposition 4 concerns the fit between emergency authority, response requirements, and review. These propositions are author-developed expectations, not findings attributed to the foundational sources.

Legal enforceability, financial and technical resources, operational dependence, and normal or stressed conditions delimit the argument. They are not described as statistically established moderators. Likewise, the coordination process is an explanatory mechanism rather than an empirically demonstrated mediator.

2.6. Counterarguments and refinement of the explanation

Counterarguments constrain the framework rather than appear only as limitations after it has been developed. Most importantly, Chu & Rathbun (2025) show that common-platform arrangements can support jurisdiction-specific capital-flow measures. Their analysis rules out a general proposition that shared infrastructure necessarily reduces policy discretion. It shifts attention from architecture labels to the allocation and continuing enforceability of particular capabilities.

Three further counterarguments shape the reasoning. First, cooperation may create a capability that was unavailable before participation; a new approval requirement cannot automatically be interpreted as a net loss. Second, collective restrictions may protect other participants and be consistent with lawful mandates. Third, national implementation may be constrained by missing resources or domestic institutional conflict rather than by cross-border governance.

Accordingly, the framework distinguishes dependency from coercion, delay from unlawful obstruction, and operational constraint from reduced monetary autonomy. It also rejects unrestricted national veto power as a universal benchmark. The relevant question is whether the allocation of authority permits legitimate coordination and the execution of specified responsibilities.

2.7. Evidentiary limits and assessment criteria

The selected evidence cannot establish the magnitude or frequency of governance effects, validate the propositions, or determine an optimal architecture. Prototype reports cannot demonstrate long-term institutional durability. Conceptual reasoning cannot resolve jurisdiction-specific legal disputes or supply a universally accepted valuation of autonomy and efficiency.

The framework is instead assessed through conceptual distinctiveness, explicit mechanisms, consistency between propositions and the figure, treatment of rival explanations, and traceability between claims and sources. Subsequent research could investigate the argument through rulebooks, permission-change records, liquidity agreements, operational incidents, and interviews. Until such evidence is available, conclusions remain conditional explanations of what should be examined—not empirical judgments that particular CBDC arrangements preserve or diminish monetary autonomy.

3. Results and Discussion

3.1 Monetary sovereignty, policy autonomy, and effective implementation capacity

The monetary implications of cross-border CBDC interoperability cannot be assessed by treating monetary sovereignty, monetary-policy autonomy, regulatory discretion, operational control, and effective implementation capacity as equivalent expressions of national control. These concepts concern different relationships between legal authority, policy choice, and institutional capability. Their distinction is particularly important where a jurisdiction retains its currency and monetary mandate but relies on shared infrastructure to execute particular operations. (Pistor, 2017) demonstrates why formal monetary powers must be examined alongside financial dependencies, while the analysis of monetary operating frameworks shows that selecting a policy stance and implementing it through liquidity provision and market operations are analytically distinct activities (Cavallino et al., 2025).

3.1.1 Monetary-policy autonomy

Monetary-policy autonomy refers to the scope available to a monetary authority to select and pursue a policy stance in accordance with domestic objectives, subject to the constraints of its international monetary and financial commitments. It does not imply insulation from foreign economic developments. A central bank may autonomously adjust its policy rate in response to the domestic consequences of an external shock; what matters is whether it retains meaningful discretion over that response. The monetary trilemma identifies a

central limitation: exchange-rate stability, unrestricted capital mobility, and independent monetary policy cannot be maintained simultaneously. Obstfeld et al. (2005) provide historical evidence broadly consistent with this trade-off. Cross-border CBDC governance should therefore be examined as a potentially additional institutional constraint on policy execution, rather than as a replacement for established explanations of monetary-policy autonomy.

3.1.2 Monetary sovereignty

Monetary sovereignty concerns authority over the monetary order, whereas monetary-policy autonomy concerns the scope for policy choice within that order. For this framework, monetary sovereignty encompasses authority over the domestic monetary unit, the issuance of central bank money, and the legal arrangements governing monetary obligations. However, its practical significance cannot be inferred from formal issuance powers alone. Pistor (2017) emphasizes that credit-based financial systems depend on monetary backstops and that foreign-currency obligations can expose jurisdictions to resources they do not control. A state may consequently retain its national currency while facing substantial external constraints. Retaining monetary sovereignty is therefore not sufficient evidence of unrestricted monetary-policy autonomy, just as dependence on foreign liquidity does not necessarily establish that sovereign authority has formally been transferred.

3.1.3 Regulatory discretion

Regulatory discretion is defined here as the range of choices legally available to an authority when specifying and applying rules within its assigned mandate. In cross-border CBDC arrangements, this may include decisions about participant eligibility, currency holdings, access conditions, or capital-flow measures. Such discretion is related to, but not identical with, monetary-policy autonomy: a restriction may pursue prudential, supervisory, or capital-account objectives without determining the domestic monetary stance. Chu & Rathbun (2025), for example, examine how jurisdiction-specific capital-flow measures can operate under alternative interoperability models. Their analysis indicates that shared infrastructure need not eliminate national regulatory capabilities. Whether a limitation on those capabilities also constrains monetary-policy autonomy requires a further explanation connecting the affected rule to policy instruments or monetary transmission.

3.1.4 Operational control

Operational control is defined as the ability to execute, modify, interrupt, or restore infrastructure functions. It must be distinguished from both lawful policy authority and mere technical capability. An operator may be able to suspend processing without being authorized to determine the policy consequences of that suspension. Conversely, a monetary authority may possess the legal power to authorize an operation while depending on another institution to execute the necessary instruction. Operational control is therefore analytically significant because monetary implementation depends on functioning mechanisms for liquidity provision, reserve management, and settlement; it does not independently demonstrate possession of monetary sovereignty or discretion over the intended policy stance (Cavallino et al., 2025).

3.1.5 Effective implementation capacity

Effective implementation capacity is defined here as an authority's practical ability to execute a specified lawful policy decision, at the required scale and within the relevant response period, using available permissions, procedures, information, and resources. It is task-specific rather than a general attribute inferred from platform ownership or formal representation. It also differs from policy effectiveness: completing an authorized operation does not guarantee the intended inflation, output, or exchange-rate outcome. Cavallino et al. (2025) explain that operational frameworks provide the mechanisms through which central banks steer operational targets in accordance with their desired stance. Implementation capacity concerns whether those mechanisms remain usable; policy effectiveness concerns the subsequent economic consequences.

These distinctions establish why reduced implementation capacity does not automatically imply reduced monetary-policy autonomy. A delayed transaction may raise costs or impair service without changing the central bank's available monetary stance. The connection becomes consequential when an infrastructure constraint restricts the operations necessary to pursue that stance and cannot be neutralized through credible alternatives. Building on the distinction between monetary choice, operational implementation, and financial dependence (Cavallino et al., 2025; Obstfeld et al., 2005; Pistor, 2017) , this article proposes four conditions for identifying such a relationship. These conditions constitute the article's theoretical synthesis, not an empirically validated result attributed to the cited studies. First, the affected operation must have an identifiable monetary-policy function. Restrictions on reserve distribution, access to central bank facilities, or settlement supporting monetary operations may interfere with the implementation of an intended stance. However, the analysis must establish this connection rather than infer it from the presence of settlement friction. Operational frameworks differ in how reserve quantities, remuneration, and standing facilities influence market rates; consequently, an identical disruption may have

different implications under different implementation arrangements (Cavallino et al., 2025).

Second, the constraint must be binding within the policy-relevant horizon. An interruption does not necessarily narrow policy choice if domestic facilities, alternative settlement routes, or compensating liquidity operations can preserve implementation. The relevant question is whether the authority can execute an economically equivalent operation within the required period, not whether every instruction is processed through its originally intended channel. This qualification is important because central banks can offset some changes in reserve supply or demand through their operating tools. The significance of a disturbance therefore depends on both the affected function and the available compensating instruments (Cavallino et al., 2025). Third, the constraint must materially alter the feasible policy set or make implementation conditional on external consent. Consider a hypothetical arrangement in which a central bank requires another body's approval to access a settlement function indispensable to its monetary operations. If approval can be withheld, no timely substitute exists, and the resulting restriction prevents implementation of the selected stance, formal rate-setting authority may coexist with reduced practical autonomy. By contrast, a predictable approval procedure that remains compatible with monetary operating requirements need not constrain autonomy. This is the mechanism proposed here: external involvement matters when it becomes a binding condition on policy execution, not merely because it exists. Fourth, the restriction must be evaluated against a credible counterfactual. Dependence on another issuer's currency does not demonstrate that interoperability has removed a capability the domestic authority previously possessed. Pistor's (2017) analysis makes clear why authority over domestic money should not be confused with control over foreign-currency backstops. A cross-border arrangement may create access to resources or settlement capabilities that were previously unavailable. Accordingly, an assessment must distinguish constraints introduced by participation from pre-existing foreign-liquidity dependence, exchange-rate commitments, or domestic institutional limitations (Obstfeld et al., 2005; Pistor, 2017). The resulting argument is narrower than the claim that infrastructural dependence necessarily diminishes autonomy. Effective implementation capacity becomes consequential for monetary-policy autonomy when its impairment affects a necessary monetary function, cannot be offset within the relevant horizon, and materially restricts the stance that the authority can implement relative to a feasible alternative. Monetary sovereignty identifies the underlying authority, regulatory discretion identifies legally available rule choices, and operational control identifies who can act on the infrastructure. Their allocation matters for monetary-policy autonomy through its effect on the continued executability of monetary decisions—not through architecture labels alone.

3.2 Coordination, adaptation, and dependence

Interoperability requires adaptation when eligibility, interfaces, operating conditions, or risks change. Williamson (1991) distinguishes governance forms by their ability to support autonomous and coordinated adjustment. Specific investments can make an arrangement productive but costly to replace. Consequential disturbances then increase the importance of adaptive safeguards. Applied to CBDCs, connectivity may expand feasible operations while creating reliance on interfaces, compliance processes, staff expertise, or liquidity channels whose replacement is difficult. Such dependence is not necessarily a governance failure. It becomes consequential when an actor can alter an essential function and affected participants cannot obtain correction or substitution within the required time. Shared infrastructure can reduce coordination problems even while restricting particular unilateral actions. The mechanism concerns the fit between adaptive responsibilities and governing powers, not a general preference for independence. Markets, hybrids, and hierarchies are not mapped literally onto CBDC architectures; the transferable concepts are coordination, specificity, and safeguards.

A second mechanism concerns incompletely specified authority. Grossman & Hart (1986) distinguish specific rights from residual control in a theory of ownership and investment incentives. The bounded application here asks who decides when a rulebook does not exhaustively specify the relevant contingency. Explicitly delegated emergency authority differs from residual discretion: the former is assigned in advance, whereas the latter concerns matter incompletely allocated. Both can matter when the institution capable of executing an action differs from the authority legally responsible for policy.

A technical operator may possess the capability to block or restore processing without a mandate to resolve an interjurisdictional policy conflict. An issuer may have the mandate but lack timely access to data or resources. Conversely, a jointly authorized body may be the appropriate decision-maker because unilateral action affects other participants. The model therefore considers authority, responsibility, and capability together. It does not infer public-law powers from platform ownership or suggest that all contingencies can be exhaustively contracted.

3.3 Network position and the autonomy-enhancing counterargument

Farrell & Newman (2019) explain how asymmetric networks can yield informational and exclusionary leverage where jurisdiction and domestic institutions enable its exercise. Centrality alone is insufficient. This limits the inference that a distributed ledger necessarily disperses control or that common infrastructure necessarily centralizes sovereignty. Technical visibility, permitted use of information, validation, and legal exclusion remain different powers. Infrastructure standards correspondingly address legal basis, governance, access, continuity, and cooperation among authorities (Committee on Payments and Market Infrastructure, 2012).

Chu & Rathbun (2025) supply a direct counterargument to an inherent-autonomy-loss account. Their comparison identifies how common-platform arrangements can support jurisdiction-specific capital-flow measures. Shared architecture should therefore not be presumed less protective of national policy discretion than intermediation through other arrangements. Whereas Chu and Rathbun (2025) examine jurisdiction-specific policy capabilities across interoperability models, the present framework focuses on the governance arrangements through which those capabilities persist after participation begins.

The proposed extension concerns durability. A policy restriction can be technically configurable at launch while subsequent governance determines who may alter or override it. The question is whether the authority can continue to use the capability under changing rules, divergent preferences, or liquidity pressure. Chey (2026) emphasizes heterogeneous national CBDC objectives, reinforcing the need to identify whose mandate and which policy are involved. One participant's coordination safeguard can be another's perceived constraint; neither interpretation establishes its normative validity without examining the agreed obligations and external effects.

3.4 Comparing architectures without unsupported rankings

Two ideal types organize the comparison. Interlinked systems preserve distinct infrastructures connected through agreed mechanisms. Shared multicurrency platforms execute operations involving several currencies within common infrastructure. Both can combine public and private participants, delegated technical operations, collective authorization, and currency-specific permissions (Auer et al., 2021; Committee on Payments and Market Infrastructure, 2022). Governance may vary within either category, and hybrid arrangements remain possible.

The comparison holds separate monetary units, wholesale access, and a cross-border settlement objective constant. It does not assume equivalent cost, maturity, transaction coverage, or legal compatibility. Architecture is a setting in which authority is organized, not a treatment that determines outcomes by itself. A hub linking separate systems can exercise consequential control, while a common platform can preserve enforceable issuer permissions. The reverse configurations are also possible. Table 1 identifies what must be investigated before interpreting either arrangement.

Table 1. Decision-right questions for alternative interoperability arrangements

Domain	Interlinked systems	Shared multicurrency platforms
Access	Who approves domestic participation and connections? Can a connector exclude an eligible institution?	Who approves platform access and currency holdings? Must operators implement issuer instructions?
Rule changes	Who revises interfaces and synchronisation standards?	Who changes common rules and currency modules, and with what consent?
Liquidity	Who supplies each currency and sets timing or collateral conditions?	Who controls prefunding, facilities, currency eligibility, and support?
Data	What information crosses interfaces and under which laws?	How are visibility, use, retention, disclosure, and jurisdiction allocated?
Disruption	Who suspends a link, protects obligations, and authorizes restart?	Who may pause operations, isolate a currency, or remove a participant?
Exit	Can an alternative route perform the function within the required time?	Can claims and operations migrate without impairing finality?

Table 1 is an analytical structure, not evidence that particular projects satisfy or fail its questions. A safeguard absent from an accessible summary should be described as not disclosed in that document rather than nonexistent. This distinction matters when public reports emphasize technical results more than operational rulebooks. Institutional comparison must not transform incomplete disclosure into a negative finding about governance quality.

Dunbar illustrates common-platform experimentation and the significance of access and jurisdictional issues (BIS Innovation hub, 2022) . Meridian FX demonstrates synchronization across experimental wholesale arrangements and is not exclusively a CBDC experiment (BIS Innovation hub,

2025) . Agorá combines commercial bank deposits and public reserves and therefore supplies a mixed-infrastructure boundary comparison rather than a pure CBDC case (BIS Innovation hub, 2026) . The projects differ in objectives and instruments and cannot function as controlled architecture comparisons or validation of the model.

3.5 The conceptual model

The explanatory domain is allocation of decision rights: who may authorize, execute, revise, suspend, and review consequential operations. Access, rule changes, liquidity, information, and crisis intervention structure this allocation. They are governance attributes, not independent variables presumed to have identical effects. The model's intervening mechanism is policy–infrastructure alignment: correspondence between an authority's lawful responsibilities and the permissions, obligations, and resources available to discharge them.

Alignment is task-specific. An authority may control currency eligibility but depend on another body for recovery. A collective approval process may support alignment when it is authorized, timely, and needed to protect other participants. Alignment consequently does not mean domestic supremacy. The outcome is effective policy-implementation capacity; dependence conditions the consequences of mismatch, while enforceability and review condition correction and durability. Resources are scope conditions because formal powers and sound procedures cannot supply unavailable liquidity or technical capability. Figure 1 represents the proposed sequence rather than estimated mediation or moderation effects.

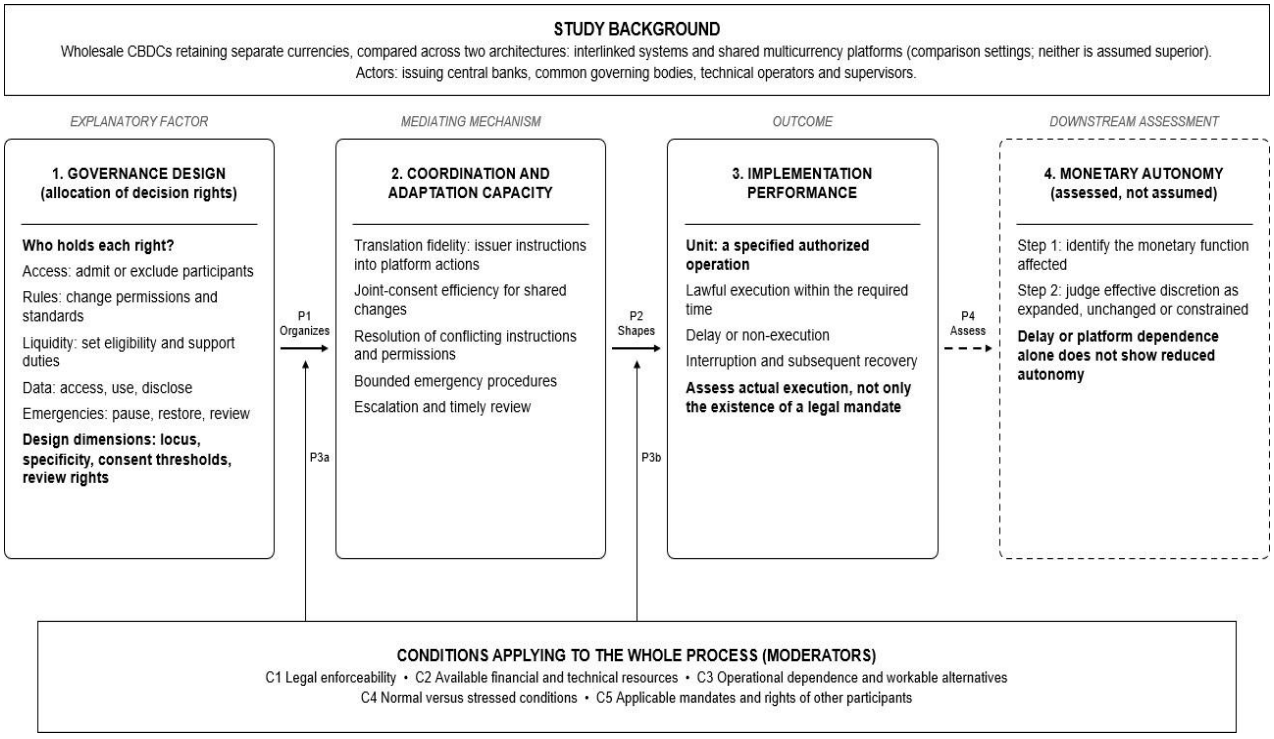


Figure 1. Proposed decision-rights and policy-implementation model

Source: Authors' developed conceptual framework

An authority may possess a mandate yet require an action controlled by the scheme governor or operator before execution. Ambiguous approval chains or inconsistent instructions can obstruct the task. Corresponding permissions and responsibilities can instead turn shared coordination into a dependable capability. Infrastructure principles support examining legal basis, governance, and resource

Proposition 1. For a specified authorized policy, decision rights permitting timely execution without unresolved institutional conflict are proposed to support implementation through policy–infrastructure alignment, conditional on adequate financial and technical resources.

The proposition does not identify unilateral control as optimal. Appropriate joint authorization can reconcile interdependent mandates, whereas individually unrestricted powers can prevent coordinated execution. Its mechanism is resolvable coordination. A relationship should not be labeled supportive merely because implementation eventually occurs; timing, lawful authorization, and the relevant operational requirements must be examined separately. This provides potential evidence against the proposition rather than rendering every outcome consistent with alignment.

Specific investments in interfaces, staff capabilities, compliance, and liquidity facilities can make alternatives difficult to use. A withdrawal clause then provides little immediate protection if outstanding obligations cannot migrate. Williamson (1991) specificity argument and Farrell & Newman (2019) conditional network analysis supply distinct premises for the next proposition.

Proposition 2. A mismatch between policy responsibilities and infrastructure-level authority is proposed to constrain implementation more strongly where essential services are difficult to substitute and affected authorities have limited effective influence over their provision.

The function's significance matters. A replaceable reporting service and an indispensable settlement gateway are not equivalent dependencies. Participation can also be rational despite constrained influence if collective benefits are substantial. Representation, enforceable commitments, alternative access, or limits on discretion may mitigate the relationship. Neither continued participation nor withdrawal alone establishes whether autonomy has been protected, since both can reflect incentives beyond infrastructure governance.

A prototype may permit an issuer to configure a restriction, but persistence depends on subsequent permissions, software modifications, and legal rules. Chu and Rathbun (2025) establish why jurisdiction-specific measures matter, while incomplete-contract reasoning directs attention to who controls adaptation (Grossman & Hart, 1986). Initial configurability should not be mistaken for a continuing right.

Proposition 3. Jurisdiction-specific safeguards are proposed to sustain alignment more reliably where authority to modify, override, and review them is explicitly allocated and enforceable than where control rests only on an initial technical configuration.

Enforceability must operate across the jurisdictions that recognize the decision. Review must also be timely for the relevant task. An appeal after a crucial settlement interval may provide accountability without restoring implementation capacity. The proposition therefore connects durability to authority and remedy rather than the mere existence of a policy module. These are proposed mechanisms, not documented deficiencies attributed to current platforms.

Disruption creates a further tension between intervention speed and accountable authority. Requiring unanimity for every technical response can impair continuity, while unrestricted operator discretion can displace policy responsibilities. Reversible technical actions must be distinguished from changes affecting access, eligibility, or legally protected rights. Comparative adaptation and infrastructure standards provide the theoretical and normative premises (Committee on Payments and Market Infrastructure 2012; Williamson, 1991).

Proposition 4. Bounded emergency powers with explicit triggers, defined scope, and timely review are proposed to preserve alignment during disruption more effectively than unrestricted discretion or approval requirements incompatible with the response window.

No particular voting threshold follows automatically. Different actions can warrant different procedures, and subsequent review cannot legitimize an otherwise unlawful intervention. The proposed relationship instead concerns fit between the urgency of the function, the consequences for affected participants, and available authority. A well-defined process can still fail if resources or information are absent, which is why the model does not treat procedural quality as sufficient for continuity.

A future application should distinguish three forms of evidence. A governing document can establish who is formally entitled to decide, operational records can show who actually made the decision, and interviews can reveal whose preferences shaped it. Agreement across these sources would strengthen an interpretation of effective authority, but discrepancies should be investigated rather than averaged into a governance score. A formally powerful committee may rarely act because staff routinely resolve issues; this need not imply capture or illegitimacy. Conversely, routine compliance does not establish that the committee could resolve a contested case within the necessary time.

The model also requires a specified counterfactual. If a task would have been impossible without the arrangement, a new approval requirement cannot automatically be interpreted as a net loss of capacity. If the same task was previously executable through another credible route, dependence on a new permission can be more consequential. The comparison must hold the function, time horizon, and relevant legal obligations sufficiently constant. This does not require constructing an idealized alternative with no costs. It requires identifying which capabilities were available, which were created, and which became conditional on another actor's decision.

Distribution should be examined at the level of responsibilities as well as benefits. An authority can receive extensive formal representation yet remain unable to supply the resources associated with its commitments. A smaller participant can also obtain meaningful protection through enforceable procedures even without equal technical capacity. The framework therefore avoids treating voting equality, market size, or operational independence as a sufficient proxy for acceptable governance. The substantive question is whether burdens, powers, and remedies correspond to the task and to the commitments participants have lawfully accepted.

3.6 Liquidity, control, and the policy channel

An issuer's capacity to create domestic money does not create another issuer's currency. Atomic exchange coordinates settlement conditions but does not establish a foreign-currency lender of last resort. Pistor (2017) explains the underlying hierarchy, while the infrastructure principles require suitable resources without promising unlimited cross-border assistance (Committee on Payments and Market Infrastructure, 2012). Foreign-liquidity access, collateral eligibility, prefunding, and emergency support must remain separate design questions.

An application of the model must trace the policy consequence rather than infer it. If unavailable foreign liquidity obstructs an operation essential to a specified monetary responsibility, practical policy capacity may be constrained. If it only increases a commercial participant's conversion cost, the appropriate interpretation is settlement dependence rather than demonstrated loss of monetary-policy autonomy. An autonomy claim therefore requires evidence that the liquidity constraint restricts a specified monetary operation, rather than merely increasing transaction costs.

Dependence can nevertheless be alleviated by cooperation. A common arrangement may provide a route to liquidity or policy coordination unavailable through isolated systems. The benchmark cannot be unrestricted national control, because such control may never have existed over foreign money. Evaluation should compare actual feasible capacities before and after participation, with attention to access conditions and the distribution of responsibilities. Formal retention of a currency is neither proof of independence nor evidence that integration has made a participant worse off.

3.7 Hypothetical stress illustration

Consider a hypothetical wholesale arrangement. An issuer authorizes a currency-specific eligibility change under its mandate. Before the update, a security incident causes the operator to suspend transactions. Participants disagree about restarting before the permission change. The illustration deliberately combines operational and policy decisions to reveal boundaries; it is not an observed incident, simulation result, or attribution to a named project.

The model asks who may authorize the update, whether suspension powers extend to policy-sensitive permissions, which institution bears consequences for pending obligations, and whether an alternative route is available. It also asks whether immediate unilateral implementation would compromise another participant's protected interests. Domestic authorization alone does not resolve the cross-border conflict, while operator capability does not necessarily confer discretion to decide it.

With specified authority, bounded intervention may protect continuity while a lawful process resolves the policy question. With ambiguous responsibilities, operational control may make the operator a de facto arbiter, or collective delay may prevent all parties from acting. The illustration demonstrates how to ask the questions, not which outcome occurs in practice. Differences in legal mandates, liquidity resources, and recovery requirements could reverse the apparent effectiveness of a governance procedure.

3.8 Contributions, counterarguments, and evaluative limits

The first intended contribution separates architecture from authority within it. Themistocleous et al. (2023) already identify non-technical challenges, and Auer et al. (2021) identify coordination alternatives. The model specifies how decisions within arrangements may become consequential. Its contribution does not depend on claiming that governance has previously been ignored, and comparison should permit variation within an architecture rather than infer effects from labels alone.

The second contribution concerns durability. Chu & Rathbun (2025) examine policy capabilities across models. This article asks how those capabilities withstand rule changes and exceptional events. The distinction between a permission at entry and an enforceable continuing right is the proposed extension. Its originality remains contingent on further comparison with the wider literature; theoretical synthesis alone does not establish novelty.

The third contribution connects adaptation, incomplete control, and conditional network leverage without making them interchangeable. Williamson (1991) explains coordination under specificity and disturbance; Grossman & Hart (1986) direct attention to incompletely assigned powers; Farrell & Newman (2019) identify jurisdictional conditions for network leverage. Together they generate a task-level explanation that can be challenged by evidence concerning actual rule-making, influence, remedies, and alternatives.

Rival explanations matter. Market size can shape bargaining independently of architecture; technical expertise can create influence without formal powers; domestic legal conflict can prevent implementation even without cross-border dependence. Participants may accept substantial constraints because access and stability gains outweigh the limitations. Chey (2026) discussions of heterogeneous objectives further caution against a single national preference for autonomy. The framework must not absorb every outcome into an unfalsifiable assertion that governance determines everything.

The recent projects illustrate this need for careful comparison. Agorá's combination of deposits and reserves and Meridian FX's synchronization

approach differ in monetary claims and institutional settings (BIS Innovation hub, 2025, 2026). The BIS blueprint accommodates shared execution and interconnected ledgers (BIS, 2023) . A convincing assessment needs the relevant legal and operating provisions, not only the technical demonstration. Missing public information should produce an explicitly unresolved conclusion rather than a favorable or unfavorable governance score.

4. Conclusion and Implications

Cross-border CBDC interoperability can expand cooperative capacity while generating consequential dependencies. Keeping a national currency does not settle authority over infrastructure, but accepting shared rules does not automatically diminish monetary autonomy. The proposed model explains this ambiguity through decision-right allocation, policy–infrastructure alignment, and effective implementation capacity. Dependence, enforceability, review, and resources condition the relationships. Its immediate contribution is a structured explanation, not an empirically validated prediction or a universal architecture ranking.

4.1 Implications for governance and oversight

Central banks and governing bodies should map the rule setter, implementer, resource provider, emergency decision-maker, and reviewer for each essential function. Software administration or platform ownership should not be presumed to establish legal authority. The infrastructure principles supply relevant normative foundations for governance, legal certainty, liquidity, access, links, and oversight cooperation (Committee on Payments and Market Infrastructure, 2012) . Table 2 translates the model into disclosure questions rather than a validated scorecard. Governance assessment should distinguish entry, routine adaptation, and stress. A launch demonstration does not establish durable capability. Exercises can examine conflicting instructions, missing liquidity, permission changes, and recovery, without presuming that existing projects lack safeguards. Governance assessments should distinguish safeguards that are not publicly disclosed from those demonstrably absent. Public reporting should also specify the time frame within which recovery or corrective action must occur to preserve the relevant policy-implementation capability. Authorities should also avoid equating autonomy with veto power. Unlimited unilateral vetoes can impair shared continuity. Collective authorization may be appropriate where external effects are substantial, while currency-specific discretion may suit decisions within an issuer's lawful remit. The framework provides questions for determining that boundary, not a universally optimal rulebook. Cross-border interoperability requires coordination beyond technical interfaces, encompassing legal, regulatory, and supervisory arrangements as well as the management of associated international financial risks (Kim et al., 2024). Oversight cooperation should make commitments explicit rather than assume technical interconnection resolves competing mandates.

Table 2. Proposed governance responsibility and disclosure map

Function	Required disclosure	Evaluation question
Participation	Issuer, scheme, operator, and supervisory powers	Can conflicting approvals be resolved lawfully and promptly?
Permission changes	Consent, delegation, notice, and exceptions	Can safeguards change without appropriate authorization?
Liquidity	Provider, limits, eligibility, collateral, and losses	Are resources credible for the service promised?
Information	Visibility, use, retention, disclosure, and jurisdiction	Does technical access exceed permitted use?
Emergency action	Triggers, scope, responsibility, and review	Is intervention executable, proportionate, and contestable?
Exit and recovery	Pending obligations, migration, and fallback	Is withdrawal operationally workable?

Operators and issuers should distinguish ordinary FX provision from emergency support. Successful exchange does not establish assured access to foreign liquidity or favorable collateral treatment. Facilities, prefunding, exposure limits, and alternatives require jurisdiction-specific evaluation. The conceptual model does not select an instrument without examining objectives, legal authority, fiscal implications, and the capacity of the party expected to provide resources.

4.2 Limitations and future research

The article does not provide systematic-review coverage, statistical testing, a formal welfare model, or an empirically validated diagram. Concepts are analytical proposals rather than psychometric measures. Institutional descriptions demonstrate possibilities but cannot establish sustained performance or actual crisis governance. Source access is differentiated, and complete final-version

full-text verification is not claimed.

The model leaves strategic bargaining, public-law conflict, domestic agency disputes, and the legitimacy of underlying policies incompletely specified. Public authorities are not firms, and ownership cannot substitute for an account of governing mandates. Effective implementation is not proof of social desirability. A policy may be executable yet inconsistent with other obligations, so future applications must retain an explicit normative and legal assessment alongside the operational inquiry.

Future research should compare actual rulebooks, permission-change procedures, liquidity agreements, legal mandates, and recovery plans. Within-architecture comparisons can identify different allocations under similar technologies. Process tracing of material changes or disruptions can investigate the proposed sequence, while interviews can distinguish formal from practical influence. Simulations can examine timing and liquidity under alternative permissions but cannot independently validate political acceptance. The methods answer different questions and should not be treated as interchangeable confirmation.

The central research priority is to trace operational constraints to specific monetary functions. Evidence connecting an access or liquidity decision to policy transmission would substantiate an autonomy claim; evidence of inconvenience alone would not. This distinction makes the framework useful to researchers and policymakers: it asks whether assigned responsibilities remain executable as rules change and disruption occurs, rather than assuming technical connectivity determines monetary control.

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