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The Global Stablecoin Race and a New Globalization: Digital Rails, Trade Policy, and Geopolitical Realignment via China's Yuan Stablecoin and Emerging Digital Economic Areas

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Abstract
The global monetary system is shifting from bank-centric pipes to programmable payment rails. Stablecoins are emerging as core infrastructure for cross-border settlement. Although the U.S. dollar anchors nearly all fiat-backed stablecoins today, this dominance is grounded in governance and trust rather than any technical moat. A new geography of money is forming around Digital Economic Areas (DEAs) as I conceptualized years ago as a new form of economic globalization: interoperable clusters of states and firms that share standards for identity, compliance, FX, and settlement. In DEAs, the rail itself becomes the policy surface, enabling tariffs, VAT, rules of origin, and sanctions to be enforced in code. China is advancing fastest toward this model. It is assembling a two-tier RMB stack—domestic e-CNY plus yuan-pegged stablecoins issued under Hong Kong's licensing regime—integrated with CIPS and the mBridge CBDC network. This architecture could convert BRI, SCO, and BRICS corridors into a China-led DEA offering 24/7 settlement, lower costs, and reduced exposure to western chokepoints, raising RMB usage without requiring full capital-account liberalization. The paper applies the DEA + Frontier Curve of Functionalities (FCF) framework to RMB FX management and corridor mapping. It evaluates a prospective China-led Digital Economic Area (DEA) in which adoption by GCC (Gulf Cooperation Council), ASEAN (Association of Southeast Asian Nations), and other states lifts RMB settlement and, by extension, RMB reserve demand. My conclusion: programmable rails redistribute monetary power—policy leverage shifts to whoever curates a rail's identity, compliance, and FX/settlement standards—making rail governance a new axis of globalization. To quantify this, I've built scenario bands that map X% of BRI trade in GCC and ASEAN corridors moving onto programmable rails into RMB flow volumes, yielding a structured forecast that converts DEA adoption assumptions into concrete flow numbers and reserve implications.

Keywords: DEA, China, e-CNY, Stablecoin, RMB, USD, USDT, CBDC, BTC, SWIFT, MiCA, BRI, SCO, BRICS, CIPS, ASEAN, GCC corridors, mBridge, Blockchain, Sovereign currency, Fiscal policy, Monetary policy, Digital Economic Area, Cryptocurrency.

Introduction
Stablecoins are rapidly becoming critical payment infrastructure. By mid-2025, USD-denominated stablecoins account for roughly 99% of the fiat-backed market, reinforcing dollar primacy in digital settlement even as China, the UAE, and others race to build alternative rails for the emerging era of "*AI money*." As a result, the U.S. continues to command the global digital monetary system, giving Washington de facto leverage over today's digital flows—a position rooted more in governance and trust than in any inherent technical moat. Domestically, this leverage has been institutionalized through the GENIUS Act of 2025, which codified a federal framework for stablecoins. By contrast, the renminbi accounts for just 2.9–3.5% of global payments and about 2.2% of allocated FX reserves. Though still modest, its share is steadily expanding via trade finance channels and bilateral swap lines. Europe, meanwhile, has taken the lead in regulatory architecture with the Markets in Crypto-Assets Regulation (MiCA), establishing one of the most comprehensive legal frameworks for stablecoins and crypto-asset service providers worldwide.

Within MiCA:

- EMT/ART rules (covering E-Money Tokens and Asset-Referenced Tokens, the EU's categories for stablecoins) became legally binding on June 30, 2024.
- These rules govern issuance, backing, redemption rights, and reserve management, ensuring that euro- or multi-asset–denominated stablecoins operate under strict supervision.
- CASP rules (for Crypto-Asset Service Providers such as exchanges, custodians, and brokers) took effect on December 30, 2024, creating a licensing and compliance regime for the firms offering crypto services across the EU.

This gives Europe one of the world's most mature, harmonized regulatory environments for stablecoins. However, market dynamics lag behind regulation: euro-denominated stablecoins still account for only a tiny fraction of the global stablecoin market. In practice, this means Europe has built strong legal plumbing, but adoption is weak—users, issuers, and DeFi protocols overwhelmingly prefer dollar-pegged stablecoins because of their liquidity, network effects, and integration in global finance.

By August 2025, the global stablecoin market cap stands at roughly $270–278 billion—up about 6% over the past 30 days with Tether (USDT) maintaining around 60% dominance (Source: DeFiLlama). Transaction volumes underscore their systemic weight: stablecoins facilitated $27.6 trillion in transfers during 2024, surpassing the combined throughput of Visa and Mastercard.

This paper reinforces the argument that China has always combined currency management with long-term strategic positioning. Having mastered physical FX interventions to protect growth and jobs (2000–2014) and controlled depreciation post-2015, Beijing is now preparing the next layer of monetary sovereignty: programmable yuan rails.

Through yuan-pegged stablecoins and the digital yuan (e-CNY), China can:

- Internationalize the RMB without abandoning capital controls.
- Offer partners a stable trade rail less exposed to U.S. sanctions and SWIFT chokepoints.
- Build digital economic areas (DEAs) where exchange-rate risk and cross-border friction are minimized, ensuring RMB's role as both settlement currency and instrument of geopolitical influence.

II. The Global shift

A new geography of money is emerging around Digital Economic Areas (DEAs): interoperable networks of countries and firms that share identity, compliance, FX, and settlement standards, turning the rail into the policy surface, where tariffs, VAT, rules-of-origin, and sanctions can be enforced in code. China is moving fastest toward this model. It is assembling a two-tier RMB stack, e-CNY domestically and yuan-pegged stablecoins via Hong Kong's licensing regime, on top of existing plumbing (CIPS) and cross-border CBDC pilots (mBridge). The objective is to convert BRI/SCO/BRICS relationships into a China-led DEA that provides 24/7 settlement, lower cost, and reduced exposure to Western chokepoints. Even partial adoption could raise RMB usage in payments and reserves without full capital-account liberalization. We can explain this shift through the theory of Digital Economic Areas (DEAs) and the Frontier Curve of Functionality (FCF)—a control framework for fiat–crypto coexistence that I introduced years ago as part of my economic theory.

Money has become political technology. Fiat draws authority from legal-tender status and institutional trust; stablecoins layer on programmability, 24/7 availability, and borderless reach. The inflection is geopolitical: whoever controls the rails dictates which rules are enforced, whose data is captured, and which sanctions bind. We can also read this shift as an extension of orthodox monetarism: traditionally, inflation and aggregate demand are steered via interest rates, reserves, and credit cycles transmitted through banks over legacy cross-border pipes (SWIFT plus correspondent banking). Even with upgrades like SWIFT gpi, material frictions persist, by 2024, roughly one-third of retail cross-border payments still required more than a business day to complete. By contrast, a more innovative programmable monetarism relocates policy transmission into the rails themselves:

- Settlement: instant or near-instant with on-chain finality.
- Availability: 24/7/365 with a transparent system state.
- Policy surface: tariffs, taxes, capital rules, AML/CFT, sanctions, and rules-of-origin can be encoded in smart contracts at the payment or asset layer.
- Rail competition: fiat stablecoins, CBDCs, and tokenized bank money—often interoperable—compete to deliver the best blend of policy control, performance, and openness.

Instruments and roles

Stablecoins are issued by private entities and (under today's major frameworks) must be fully backed by cash and short-term government bills, with licensing and prudential oversight—e.g., the EU's MiCA categories for EMTs/ARTs and the U.S. GENIUS Act licensing regime. The pitch: a 24/7 digital dollar/euro with instant, programmable settlement and clear redemption rights. CBDCs are direct central-bank liabilities, deployed as retail (citizen-facing) or wholesale (FMIs/bank-to-bank). Cross-border pilots like mBridge show how multiple central banks can link platforms to move value with fewer intermediaries and hard settlement finality. Tokenized deposits sit between the two: regular commercial-bank money represented as tokens on permissioned ledgers. They inherit banking safeguards (KYC/AML, capital, deposit insurance), gain on-chain transferability, and can sync with RTGS systems and atomic PvP (payment vs payment) workflows.

A Digital Economic Area (DEA) is best thought of as a policy-aware network: participants agree on shared standards for identity, compliance, FX, and settlement so that the rail becomes the policy surface. Taxes, tariffs, rules-of-origin, sanctions checks, even ESG attestations can be enforced in code, consistently, automatically, and at the moment of payment. To govern coexistence between fiat and crypto inside these areas, we use the concept of the Frontier Curve of Functionality (FCF) to explain this move.

The FCF, indeed, marks the set of conditions where agents get equal marginal utility from fiat rails and from crypto rails. Around that curve lies a coexistence band: a stable zone in which people rationally hold and use both, and monetary policy still transmits effectively. Policy and technology act like sliders on a control panel—improving programmability, lowering frictions, strengthening trust, or

tightening guardrails can move a system toward or away from that band. For central banks and regulators, the FCF offers a quantitative way to balance innovation and stability; for builders, it shows which features (faster settlement, cheaper on/off-ramps, composable compliance) nudge the economy onto the frontier rather than past it.

The latest shift

Beijing's latest shift, considering yuan-backed stablecoins and standing up an e-CNY international operations center in Shanghai, signals a plan to knit together trade partners on programmable RMB rails, complemented by Hong Kong's brand-new licensing regime for stablecoin issuers. This is not just fintech, it is statecraft: the ability to embed trade policy, sanctions posture, and capital controls directly into payment code, building digital economic areas that alter alliances and reroute value flows. Meanwhile, Western policy is bifurcating: the EU's MiCA is live for stablecoin issuers and fully applicable to CASPs, while the U.S. enacted the GENIUS Act (2025) - its first federal stablecoin law - locking in reserve, disclosure, and supervisory expectations. Both moves will shape which rails become "trust anchors" for the next decade.

China's timing is both ruthless and smart. The United States remains distracted by electoral cycles and has only recently codified a federal stablecoin regime. Europe has a strong regulatory framework in MiCA, but its rollouts are slow and weighed down by process. Emerging markets, meanwhile, are seeking faster, cheaper payment rails and reduced exposure to sanctions. Against this backdrop, China is moving to endorse yuan-backed stablecoins and to internationalize e-CNY operations from Shanghai—a sharp pivot from its 2021 crypto ban toward a strategy of exporting programmable RMB influence.

China's Currency Strategy Moves to Digital Rails

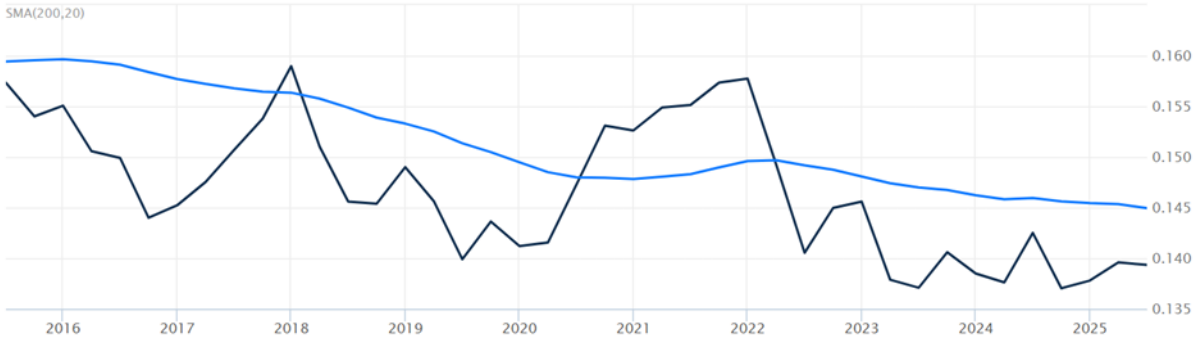
From 2000 to 2014, China relied on foreign-exchange accumulation and an export-driven engine, with the PBoC intervening heavily to suppress RMB appreciation. FX reserves peaked at nearly $4 trillion in June 2014. A key milestone came in 2005, when Beijing shifted from a hard USD peg of 8.28 to a managed float "with reference to a basket"—a system that preserved control while allowing limited flexibility.

Two decades later, China is executing a "silent build" of digital RMB plumbing. The Cross-Border Interbank Payment System (CIPS) has scaled up to 122 countries as of July 2025. Project mBridge has reached its minimum viable product stage and is now run directly by participating central banks, including the UAE, HKMA, BoT, and PBoC, following the BIS's exit. In June 2025, Shanghai was designated as the international operations center for the e-CNY.

Meanwhile, Hong Kong is emerging as a testing ground. The Hong Kong Stablecoins Ordinance came into force on August 1, 2025, with licensing now open and the first wave of applicants, including a Standard Chartered joint venture, lining up. In parallel, China's State Council has begun exploring yuan-backed stablecoins as part of a broader push to internationalize the currency.

Taken together, Beijing is positioning a two-tier digital stack: the e-CNY as a sovereign instrument, complemented by licensed RMB-backed stablecoins—particularly out of Hong Kong. This architecture would generate programmable RMB liquidity for trade partners and financial corridors that China has spent years cultivating.

Chart Analysis: CNY/USD Exchange Rate, 2016–2025



Source: www.wsj.com, CNY/USD historical data with SMA overlay (2016–2025)

The chart above illustrates the evolution of the CNY/USD exchange rate from 2016 to 2025, with a 200-day simple moving average overlay (blue line). Several trends stand out:

1. **Stability through intervention:**
2. **Volatility in crises:**
3. **Strategic floor yuan per U.S. dollar at ~7 (≈0.14)**

Between 2016 and 2019, the yuan followed a pattern of controlled depreciation with periodic rebounds, reflecting Beijing's strategy of preventing sharp appreciation while preserving export competitiveness. The smoother moving-average trend line underscores the PBoC's use of a managed float regime, dampening volatility through targeted intervention.

Periods of crisis revealed more pronounced swings. The COVID-19 shock in 2020 and renewed U.S., China trade tensions in 2022 triggered sharp short-term movements, yet the longer-term averages show how authorities successfully contained broader depreciation pressures.

Central to this management has been the defense of the psychologically important 7 CNY/USD threshold. Repeated interventions at this level highlight Beijing's recognition of the domestic and international confidence risks of a decisive break below it. By maintaining this floor, China has been able to limit capital flight and uphold the RMB's credibility in trade settlement.

After 2023, volatility narrowed, but the moving averages suggest a gradual weakening trend driven by slowing

growth, softer domestic demand, and persistent external pressures. In this context, Beijing's exploration of yuan-backed stablecoins can be read as a strategic hedge: a way to provide international digital liquidity and expand the RMB's reach—without committing to full liberalization of the onshore currency.

Through yuan-pegged stablecoins and the digital yuan (e-CNY), China can:

- Internationalize the RMB without abandoning capital controls.
- Offer partners a stable trade rail less exposed to U.S. sanctions and SWIFT chokepoints.
- Build digital economic areas where exchange-rate risk and cross-border friction are minimized, ensuring RMB's role as both settlement currency and instrument of geopolitical influence.

In short: the chart demonstrates the historical logic of China's monetary behavior and why stablecoins are its logical next instrument for reinforcing sovereignty in the digital era.

III.Digital Economic Areas (DEAs): How Rails Become Policy

A Digital Economic Area (DEA) - as I conceptualized years ago - is a policy-aware network where countries and firms settle on a common programmable rail while moving along the frontier curve of fiat–crypto coexistence. The rail can be implemented with regulated stablecoins, central bank digital currencies (CBDCs), tokenized deposits, and non-sovereign cryptoassets (e.g., Bitcoin), and it is governed by a shared rulebook. Participants adopt common standards for identity/KYC, compliance and messaging, FX/liquidity management, and settlement finality, with digital currencies serving as the settlement asset. In practice, a DEA turns the payment rail into a policy surface: rules execute in code, interoperability follows from standards, and monetary/financial stability is preserved by design rather than only by after-the-fact supervision.

What the rail enables

i) Policy in code: tariffs and taxes assessed at the moment of payment and remitted automatically to treasuries.
ii) Embedded controls: sanctions and blacklists enforced on-chain, with cryptographic proofs and auditable logs.
iii) Programmable trade finance: rules-of-origin, quota/ESG attestations, and subsidy conditions encoded in tokens and smart contracts.
iv) Pre-wired FX corridors: e.g., RMB↔GCC (Gulf Cooperation Council currencies), deterministic pricing, and immediate finality—24/7.

Why it matters

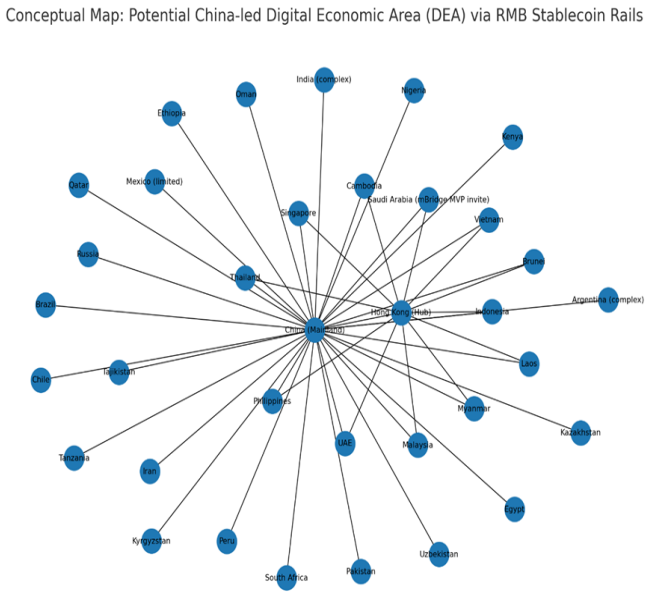
In a DEA, the payment rail is the policy surface. Whoever designs and maintains the standards—identity, compliance, FX and settlement rules—effectively sets trade policy, shapes capital mobility, and reconfigures alliances. Evidence from the ECB and FSB shows legacy cross-border frictions (time zones, multi-hop compliance, wide FX spreads) remain material, which only heightens the appeal of programmable rails that embed speed, finality, and policy enforcement by design. We are likely moving from a currency contest defined mainly by exchange rates to one defined by the rails that move value. In the United States, a federal stablecoin statute anchors a strategy to "dollarize the internet" via compliant USD stablecoins—deepening demand for short-term Treasuries as reserves and extending dollar primacy into programmable finance. China, by contrast, is laying RMB rails: an e-CNY international operations center in Shanghai, the CIPS clearing network, participation in mBridge, and Hong Kong's licensing regime for RMB-backed stablecoin issuers—together offering partners sanctions-resilient, policy-aware settlement. Across the Gulf, the UAE and neighbors are positioning as a digital-payments hub, targeting a retail digital dirham after cross-border pilots on mBridge. Europe brings regulatory clarity with MiCA; its strategic test is to cultivate a competitive euro-stablecoin ecosystem so it does not end up transacting—by default—on USD (or future RMB) rails.

China Digital Economic Area (DEA)

If China scales an RMB stablecoin rail, Belt and Road partners[1] could begin settling trade directly in yuan, bypassing U.S.-dollar pipes and some sanction chokepoints. The technology enables smart-contracted trade policy—tariffs, compliance checks, carbon metrics, subsidy rules—embedded in the payment flow itself. Over time, this would support a China-centric Digital Economic Area, decoupling portions of global commerce from USD- and SWIFT-dominated infrastructure and reshaping alliances around whoever governs the standards of the rail. The plumbing is already extensive: by July 2025, CIPS (RMB Cross-Border Interbank Payment System)[2] connected 176 direct and 1,531 indirect participants across 122 countries, providing a ready backbone on which an RMB stablecoin network could propagate at scale.

[1] The countries that have signed a memorandum of understanding (MoU) with China to participate in the Belt and Road Initiative (BRI).

[2] CIPS (Cross-Border Interbank Payment System) is China's infrastructure for cross-border RMB (renminbi) clearing and settlement. It is operated by CIPS Co., Ltd. (controlled by the People's Bank of China) and was launched in 2015 with a straightforward goal: to give the RMB a native, efficient, compliant channel for paying and receiving funds overseas without always routing through U.S.-dollar correspondent banks or foreign clearing houses.



This figure presents a network-style schematic of potential China Digital Economic Area (DEA) for a yuan-stablecoin rail, anchored in Mainland China with Hong Kong as the issuance / compliance hub. It is a conceptual rail map (not a political map) that highlights likely on-ramps: Hong Kong's new stablecoin licensing regime, mBridge corridors, Belt & Road partners, and jurisdictions already connected to CIPS—which counts 176 direct and 1,531 indirect participants across 119+ countries/regions (July 2025).

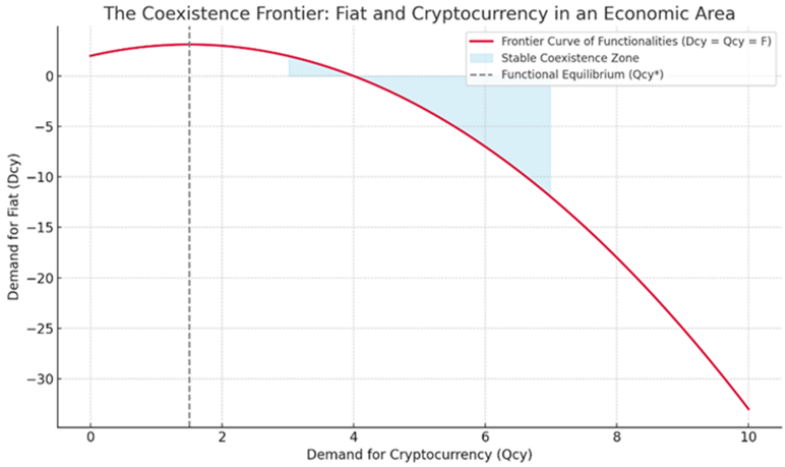
The map shows:

- mBridge cohort / invitees: UAE, Thailand, Saudi Arabia (per HKMA/BIS updates).
- SCO/BRICS core: Russia, Kazakhstan, Pakistan, Iran, South Africa, Brazil, Egypt, Ethiopia; India marked as *complex* given geopolitics.
- ASEAN: Vietnam, Indonesia, Malaysia, Singapore, Philippines, Cambodia, Laos, Myanmar, Brunei, Thailand.
- GCC corridors: UAE, Saudi Arabia, Qatar, Oman.
- Africa & LatAm touchpoints: Kenya, Nigeria, Tanzania; Chile, Peru, Brazil, Argentina (*complex*), Mexico (*limited*).

Beijing is now signaling that yuan-backed stablecoins are under active consideration as part of a broader roadmap to internationalize the renminbi—a program likely to be piloted first via Hong Kong and Shanghai. The policy messaging tracks what is already visible on the ground: cumulative e-CNY trial transactions reached about ¥7.3 trillion by July 2024, while Hong Kong is positioning itself as a regulatory sandbox for stablecoin frameworks. Taken together, these moves validate a dual-rail strategy that couples a sovereign CBDC with licensed, fully reserved stablecoins, laying the foundation for programmable RMB liquidity at scale. In practice, the sequence is deliberate. Hong Kong's licensing regime ring-fences issuance and custody, enforces reserve quality and disclosures, and provides AML/CFT guardrails - ideal for offshore RMB distribution to trade partners - while Shanghai's e-CNY international operations center anchors the onshore policy stack. Interoperability with CIPS (for RMB clearing) and mBridge (for multi-CBDC cross-border settlement) would allow programmable flows - tariffs, VAT, sanctions checks, rules-of-origin - to execute at settlement time, with deterministic finality and 24/7 availability. For counterparties, that means lower frictions, fewer correspondent hops, and embedded compliance; for Beijing, it preserves capital-account discipline while expanding RMB usage in trade finance, energy/commodities, and BRI corridors.

The likely operating model favors fiat-backed, regulator-supervised RMB stablecoins, issued by licensed entities in Hong Kong, with high-quality liquid assets held in RMB/CNH. Governance would emphasize whitelisting, circuit breakers, and liquidity backstops to keep activity within the fiat–crypto coexistence band described by the DEAs + Frontier Curve framework. Strategically, this positions the RMB to gain share in payments and collateral without wholesale capital-account liberalization, while giving partners a sanctions-resilient, policy-aware rail that can scale along existing plumbing.

Digital Economic Areas (DEAs) and the Frontier Curve of Functionalities



The global monetary system is moving from bank-centric pipes to programmable payment rails. Stablecoins and other crypto-assets are becoming the connective tissue of that shift. China is advancing fastest. It is assembling a two-tier RMB stack—e-CNY for the domestic layer and yuan-pegged stablecoins via Hong Kong's licensing regime for the external layer—mounted on existing plumbing (CIPS) and cross-border CBDC pilots (mBridge). The aim is to convert

BRI/SCO/BRICS relationships into a genuinely China-led Digital Economic Area (DEA) that offers 24/7 settlement, lower cost, and reduced exposure to Western chokepoints. Even partial adoption could lift RMB usage in payments and reserves without full capital-account liberalization.

This trajectory fits my earlier theory of Digital Economic Areas (DEAs), governed by the Frontier Curve of Functionalities (FCF) as a control framework for fiat–crypto coexistence. The FCF identifies where agents obtain equal marginal utility from fiat and crypto rails, defining a coexistence band within which both are rationally used, and monetary policy still transmits effectively. Inside the frontier (fiat-dominant), crypto utility is too low—speed, programmability, reliability, or infrastructure are insufficient—so adoption remains limited. On the frontier (the coexistence sweet spot), technology, policy, and trust are balanced; programmable rails complement, rather than replace, fiat. Outside the frontier (crypto-dominant), crypto usage becomes so pervasive that fiat transmission weakens, and policy efficacy erodes, especially if the state is unprepared for decentralized finance.

China's DEA strategy is explicitly designed to push partners toward the frontier: it raises functionality (instant settlement, smart-contract compliance, DeFi-enabled credit rails) and policy readiness (licensing, high-quality reserves, capital-flow management), while avoiding overshoot into crypto dominance. For central banks, the FCF quantifies how much innovation can be absorbed while preserving stability. For regulators, it maps risk zones of under- or over-adoption. For technologists, it confirms that adding real-world functionality—faster payments, cheaper on/off-ramps, embedded compliance—moves economies toward coexistence on programmable rails.

DEA Scale: The Addressable Base

The Belt and Road Initiative[3] gives China a ready-made launchpad for what I imagined several years ago a Digital Economic Area. Indeed by 2025, 150 countries were formally engaged with the BRI, with annual engagement that year totaling $121.8 billion across roughly 340 deals. Cumulative engagement since 2013 has surpassed $1.17 trillion.

Trade flows amplify the opportunity: more than half of China's imports in 2024 originated from BRI partner countries, suggesting that a programmable RMB rail - anchored in e-CNY or yuan - backed stablecoins - could rapidly scale into significant volumes. By contrast, the United States and the eurozone already enjoy deeply entrenched monetary zones. The dollar dominates global settlement, accounting for more than 40% of international payments by value and over 58% of allocated FX reserves, while the euro holds roughly 14–20% shares in those same categories (SWIFT, IMF). Both currencies benefit from network effects built through decades of trust, infrastructure, and institutional depth.

China's proposition is therefore different: it cannot yet match the incumbents' scale in reserves or payments, but it can overlay digital rails across the BRI ecosystem, where demand for faster, cheaper settlement is acute. In effect, Washington and Brussels inherit legacy monetary blocs, while Beijing is attempting to *manufacture* one by turning trade corridors into a programmable economic area.

RMB's Starting Position (2024–2025)

On global rails, the renminbi is still a minority player. In SWIFT payment traffic it holds roughly 2.9% by value as of May–June 2025—about sixth worldwide—after peaking near 4.7% in July 2024. In reserves, IMF COFER data puts the RMB at roughly 2–3% of allocated FX holdings in early 2025. Inside China's own cross-border channels the picture looks larger—reports show the RMB exceeding 50% of mainland cross-border payments in 2023–2024—but that headline is heavily skewed by Mainland–Hong Kong flows rather than a broad global uptake. Net: modest global penetration, concentrated regional usage, and a clear incentive for Beijing to scale programmable RMB rails to convert regional intensity into wider settlement share.

IV. Impact Scenarios for RMB Rails (DEA)

I've structured some scenario bands that line up from different sources (SWIFT, IMF COFER, HKMA, CIPS, Reuters, etc.) and with historical growth ranges in comparable transitions. Here after I have quantified this further with scenario modeling (e.g., estimating potential RMB flow volumes if X% of BRI trade shifts onto programmable rails), to become more like a structured forecast model that turns my DEA adoption assumptions into concrete flow numbers and reserve implications.

Reference values

- Base flow *(China–BRI goods trade, 2024)* = VBRI = ¥22.1T≈ $3.07T @ 7.2 CNY/USD.

To calculate it:

We take the value ¥22.1 trillion and convert at 7.2 CNY/USD:

$$V_{\text{BRI}} = \frac{\text{¥22.1 trillion}}{7.2} \approx \$3.0694 \text{ trillion} \approx \mathbf{\$3.07T}$$

Notes: this is **goods only** (not services), rounded to two decimals, and it's the anchor used to size all the scenarios. Adjusting the FX rate or adding services will change $\mathbf{V_{BRI}}$

- Global yardstick *(world trade, 2024) = W* = $33T goods + services

I have derived this metric only to express an *implied share of global trade value* (this is not a SWIFT payments share of course). It's an aggregate value of world trade in 2024 (*Source: UNCTAD's "Global Trade Update"*), combining goods + services in current USD (no inflation adjustment).

Scenarios & parameters

1) Adoption on RMB rails: A ∈ {0.10, 0.25, 0.50}

The **"A"** scenario stands for how much of China–BRI trade uses the new programmable RMB rails (mBridge/CIPS + HK-licensed RMB stablecoins).

- A=0.10 ⇒ 10% of that trade settles on RMB rails.
- A=0.25 ⇒ 25% of that trade settles on RMB rails.
- A=0.50 ⇒ 50% of that trade settles on RMB rails.

Why it matters: It sets the gross throughput on the rail. Higher "A" means more value actually moving over programmable settlement.

Example: If China–BRI goods trade is $3.07T, then

[3] Launched in 2013, the Belt and Road Initiative (BRI) is China's umbrella for cross-border infrastructure and connectivity—transport, energy, ports, industrial parks, and increasingly "digital/green" projects—intended to tighten trade and investment links between China and partner economies.

- A=0.10 → gross RMB-rail flows ≈0.10×3.07=$0.31T
- A=0.25 → ≈$0.77T
- A=0.50 →≈$1.53T

Based on "A" we can derive the Gross RMB-rail flow: *Fgross* (USD)

$$F_{\text{gross}} = A \cdot V_{\text{BRI}}$$

VBRI: China–BRI goods trade in USD (≈$3.07T).
A: Adoption Share on RMB rails (e.g., 10%,25%,50%).

Implied share of global trade:

$$s_{\text{gross}} = \frac{F_{\text{gross}}}{W}$$

2) Baseline RMB penetration (sensitivities): B ∈ {0.10, 0.20, 0.30}

"B" is an assumption about the share already in RMB today, *before* programmable rails roll out. We vary "B" to test sensitivity because different corridors already use RMB to different degrees. Only non-RMB flows can switch to RMB. So B determines the incremental RMB settlement created by adoption.

- Formula: **Incremental RMB-ization**

F*incr*=A·(1−B)· VBRI

Example (with VBRI **=$3.07T):**

- If A=0.25, B=0.20: F*incr* = 0.25×0.80×3.07 ≈ $0.61T
- If we raise B to 0.30, incremental falls: 0.25×0.70×3.07≈$0.54T

With implied share:

$$s_{\text{incr}} = \frac{F_{\text{incr}}}{W}$$

3) Reserve buffer ratios: *ρ* ∈ {2.5%, 5%, 7.5%)

The ***ρ*** is a policy/operations knob that sets the RMB liquidity cushion held by treasuries/central banks to ensure smooth settlement on the new rails (think working float, margin, and stress buffer). It matters because even if flows are predictable, you need RMB on hand to avoid bottlenecks from cut-off times, time-zone gaps, market volatility, and compliance holds. The "right" ***ρ*** depends on netting efficiency, settlement lags, and risk tolerance; early phases typically use higher buffers.

Reserve buffer on gross flows:

$$R(\rho) = \rho \cdot F_{\text{gross}}$$

ρ: chosen policy ratio (e.g., 2.5%,5%,7.5%).

In short:

- A explains how big the rail becomes.
- B explains how much of that is truly new RMB usage.
- ρ turns those flows into operational RMB liquidity to likely hold to keep the system running smoothly.

China Digital Economic Area (DEA) simulation

A) Gross_Flows (USD; billions unless note)

Table A sizes the rail (throughput) and gives **operational RMB** needs at different buffers.

Adoption rate (%)	Gross RMB-rail flows ($B)	Implied share of 2024 world trade (%)	Reserve buffer @ 2.5% ($B)	@ 5% ($B)	@ 7.5% ($B)
10	307	0.93	8	15	23
25	767	2.33	19	38	58
50	1,535	4.66	38	77	115

Adoption rate (%): share of China–BRI goods trade that settles on RMB programmable rails (mBridge/CIPS + HK-licensed RMB stablecoins).

Gross RMB-rail flows ($B):

$$F_{\text{gross}} = A \cdot V_{\text{BRI}}, \quad V_{\text{BRI}} \approx \$3{,}070\text{B}$$

B) Implied share of 2024 world trade (%): communication metric (not a SWIFT share):

$$s_{\text{gross}} = \frac{F_{\text{gross}}}{W} \times 100, \quad W \approx \$33{,}000\text{B}$$

[Example (10%): 307/33,000=0.0093⇒0.93%]

C) Reserve buffers @ 2.5/5/7.5% ($B): indicative RMB liquidity to keep settlement smooth (working float + margin + contingency):

$$R(\rho) = \rho \cdot F_{\text{gross}}$$

[Example (10%, 5% buffer): 0.05×307=15 B].

Interpretation. Even at 10% adoption, the rail carries ~$0.31T (0.93% of world trade), implying **~$15B of buffer at 5%. By 25%, it's ~$0.77T and ~$38B buffer; by 50%, ~$1.53T and ~$77B.**

B) Incremental (vs. 20% baseline already in RMB)

Table B isolates the incremental RMB settlement—the part of gross throughput that is newly denominated in RMB after migrating non-RMB flows, given the baseline already in RMB. This is the adoption metric that matters for currency usage and reserve sizing.

Adoption rate (%)	Incremental RMB settlement ($B)	Implied share of 2024 world trade (%)
10	246	0.74
25	614	1.86
50	1,228	3.72

What changes here

- We assume 20% of China–BRI trade is already in RMB. Only the non-RMB portion can migrate, so we compute new RMB usage:

$$F_{\text{incr}} = A \cdot (1 - B) \cdot V_{\text{BRI}}, \quad B = 0.20$$

[Example (10%): 0.10×0.80×3,070=246 B].

We express a communication ratio (again, not a SWIFT share):

$$s_{\text{incr}} = \frac{F_{\text{incr}}}{W} \times 100$$

[Example (10%): 246/33,000=0.00745⇒0.74%].

C) Reserve_Share_Delta (deltas in percentage points of reserves)

This table turns operational liquidity needs (how much RMB you hold to run the rail smoothly) into a policy-relevant change in the bloc's RMB reserve share. In other words, it explains how much a bloc's RMB reserve share would go up (in percentage points) if some share of BRI trade starts using RMB on programmable rails and you keep a small **RMB buffer** to run those rails smoothly.

So, For example, we can say by reading the data that: "*At 25%* adoption with a 5% buffer, the implied RMB reserve-share delta is +1.5 pp (percentage points) for a $2.5T reserve bloc (about +1.9 pp at $2T; +1.3 pp at $3T)."

Adoption rate (%)	Buffer (%)	R_total ($B)	Δ @ $2T (pp)	Δ @ $2.5T (pp)	Δ @ $3T (pp)
10	2.5	8	0.38	0.31	0.26
10	5	15	0.77	0.61	0.51
10	7.5	23	1.15	0.92	0.77
25	2.5	19	0.96	0.77	0.64
25	5	38	1.92	1.53	1.28
25	7.5	58	2.88	2.30	1.92
50	2.5	38	1.92	1.53	1.28
50	5	77	3.84	3.07	2.56
50	7.5	115	5.76	4.60	3.84

Each row shows the implied increase in RMB reserve share if the bloc's total reserves are $2T, $2.5T, or $3T.

The inputs:

- **Adoption rate (%)**: How much of BRI trade uses the RMB rail (10%, 25%, 50%, etc.).
- **Buffer (%)**: How big a working-capital cushion in RMB you keep relative to yearly RMB flows on the rail (e.g., 5%).
- **R_total ($B)**: the buffer applied to gross flows (from Table A). It explains the resulting RMB buffer you'd need to hold, in billions. It's simply Buffer × RMB flows.

In Formula:

$$R_{\text{total}} = \rho \cdot F_{\text{gross}}$$

Said that, the **$2T / $2.5T / $3T** numbers are a scenario for the total FX reserves of the whole bloc (e.g., GCC + ASEAN + other participants) - i.e., the sum across those countries' central banks.

Reserve-share delta (pp) against a bloc's Total FX Reserves of $2T / $2.5T / $3T:

$$\Delta s_{\text{RMB}} = 100 \times \frac{R_{\text{total}}}{\text{Total FX Reserves}}$$

Example: (25% adoption, 5% buffer):

- Table A flows ≈ $767B
- R_total=0.05×767=38.35B
- Δs_{RMB} @ $2T: 100×38.35/2000≈1.92
- Δs_{RMB} @ $2.5T: 100×38.35/2500≈1.53
- Δs_{RMB} @ $3T: 100×38.35/3000≈1.28

Conclusion: Rising structural demand for RMB is likely to strengthen the CNY versus the USD.

Conclusion

Money is becoming political technology as code becomes policy. This paper argues that programmable payment rails are reorganizing globalization into Digital Economic Areas (DEAs)—networks where the rail itself enforces trade rules, taxes, and sanctions alongside payments. Markets will gravitate toward the Frontier Curve of Functionality (FCF)—the most efficient DEA frontier. China is moving first and fastest. A two-tier RMB stack—domestic e-CNY plus yuan-pegged stablecoins issued under Hong Kong's regime—layered onto CIPS and mBridge provides a credible path to policy-aware settlement that reduces exposure to Western chokepoints while preserving capital controls. In short, programmable rails redistribute monetary power: policy leverage shifts to whoever curates a rail's identity, compliance, and FX/settlement standards, making rail governance a new axis of globalization. To quantify this, I build scenario bands that map X% of BRI trade in GCC and ASEAN corridors moving onto programmable rails into RMB flow volumes, yielding a structured forecast that converts DEA adoption assumptions into concrete flow numbers and reserve/FX appreciation implications.

For policymakers, the choice is no longer "crypto vs. fiat," but which rails to champion and how to interoperate. The near-term agenda is clear: (1) codify cross-rail identity, sanctions, and finality standards; (2) supervise reserves, liquidity, and disclosures for systemically relevant stablecoins; (3) instrument trade policy in code with guardrails; and (4) monitor the FCF to ensure innovation moves economies toward the coexistence frontier. For emerging DEAs, strategic resilience means multi-rail optionality—plugging into USD, RMB, and regional rails while holding neutral reserves (including BTC) to hedge policy risk.

The contest ahead isn't just about currencies—it's about who writes and governs the protocols that move value. Digital Economic Areas (DEAs) will translate geopolitical preferences into programmable reality. If policy keeps pace with technology, fiat and crypto can coexist on the frontier, delivering faster trade and broader inclusion.

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