The Stablecoin Stack

Infrastructure, Regulation, and the New Payment Rails

BLOCKS & bonds

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Executive Summary

The Stablecoin Stack: Infrastructure, Regulation, and the New Payment Rails

Stablecoins have quietly crossed a critical threshold.[1] What began as a niche tool for crypto trading has evolved into a functional layer of global financial infrastructure. Today, stablecoins are increasingly used for settlement, payments, treasury management, and cross-border value transfer—often operating faster, cheaper, and with greater programmability than legacy payment systems.

This shift marks a transition in how stablecoins should be understood. They are no longer best described as "crypto assets." Instead, they are emerging as digital settlement instruments, combining elements of money market funds, payment rails, and programmable software. The result is a new financial stack—one that sits alongside, and increasingly integrates with, banks, payment processors, and enterprise systems.

Three structural forces are driving this transformation.

First, payments—not speculation—have become the dominant stablecoin use case.[2] While trading volumes remain significant, growth is increasingly concentrated in real-world applications: cross-border payments, B2B settlement, merchant payouts, global payroll, and internal treasury operations. In these contexts, stablecoins function less like volatile assets and more like digital cash with global reach.

Second, blockchains are being repurposed as settlement layers. Public blockchains—particularly those optimized for speed, cost, and finality—are increasingly used as neutral, always-on settlement networks. In this model, blockchains resemble interbank clearing systems more than consumer-facing applications. The value accrues not from speculation, but from reliable execution, atomic settlement, and reduced reconciliation.

Third, regulation is shifting from uncertainty to structure. Across major jurisdictions, policymakers are no longer debating whether stablecoins should exist, but how they should be supervised. Compliance requirements—reserve transparency, licensing, transaction monitoring, and consumer protections—are becoming defining features of "payment-grade" stablecoins. Far from stifling adoption, regulatory clarity is increasingly acting as a moat, separating scalable infrastructure from experimental finance.

Together, these forces are reshaping the stablecoin ecosystem into a layered stack:

- Issuers manage reserves, compliance, and monetary trust
- Settlement layers provide finality and programmability
- Compliance and control systems enforce policy and risk management
- Wallets, custody providers, and APIs enable access and integration
- Banks and enterprises connect stablecoins to the traditional financial system
- Applications embed stablecoins into real economic workflows

This report examines each layer of that stack in detail, with a focus on four core areas: issuers, settlement infrastructure, compliance frameworks, and bank integration. It analyzes how value and control are distributed across the stack, where incumbents retain advantages, and where new entrants are creating leverage.

A central conclusion emerges: stablecoins are not replacing banks or payment networks—they are rewiring how money moves between them. Banks are experimenting with issuance, custody, and settlement. Payment companies are integrating stablecoins as back-end rails. Enterprises are adopting stablecoins not for ideological reasons, but because they solve concrete operational problems.

Over the next 12–36 months, the most important developments will not be driven by consumer speculation, but by institutional adoption: payment-grade issuance, bank-native stablecoins, deeper integration with treasury systems, and increasing interoperability with tokenized real-world assets. The stablecoin stack is solidifying into infrastructure—quietly, incrementally, and with lasting impact.

For financial institutions, enterprises, and policymakers, the question is no longer if stablecoins matter, but where they fit within the future architecture of money.

Section II: Settlement Layers & the New Payment Rails

From Networks of Trust to Networks of Execution

For decades, global payments have relied on layered systems built for trust, not speed. Settlement occurs through intermediated networks—banks, clearing houses, card schemes—where transactions are authorized instantly but finalized slowly. Reconciliation, batching, and counterparty risk are features, not flaws, of this design.

Stablecoins invert that model.

Instead of routing payments through networks of institutional trust, stablecoin transactions settle on shared execution layers—public blockchains—that provide finality directly at the infrastructure level. **This shift is subtle but profound: money movement becomes a software process rather than an accounting one.**

2.1 Blockchains as Settlement Infrastructure

Public blockchains are increasingly functioning as neutral settlement networks, analogous to—but more flexible than—traditional interbank systems such as RTGS, ACH, or correspondent banking rails.[3]

Key characteristics distinguish blockchain-based settlement:

Continuous operation

- Blockchains settle transactions 24/7/365, eliminating cutoffs, weekends, and holiday delays.[4]

Atomic finality

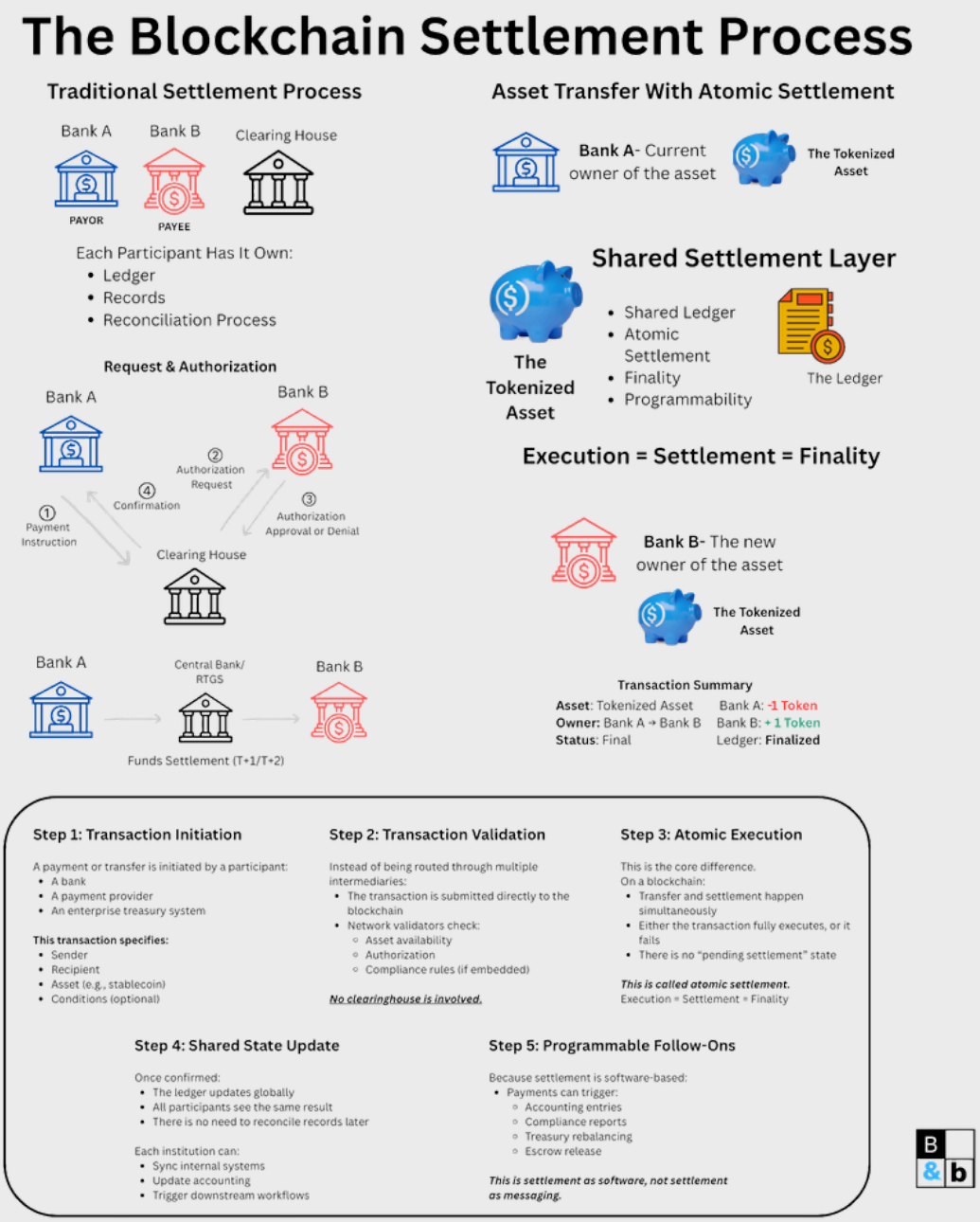
- Settlement and transfer occur simultaneously. There is no separation between authorization, clearing, and settlement.

Shared state

- All participants reference the same ledger, reducing reconciliation overhead and operational risk.

Programmability

- Settlement logic can be embedded directly into transactions, enabling conditional payments, automated compliance, and real-time treasury workflows.



Importantly, this does not mean blockchains replace banks. Instead, they act as interbank settlement substrates, allowing banks, issuers, and payment providers to interact on a common execution layer.

In this model, blockchains are infrastructure—not products.

2.2 Layer 1 vs Layer 2: Tradeoffs for Payments

As stablecoin volumes increase, settlement efficiency becomes critical. This has driven a functional division between base settlement layers (Layer 1) and execution layers optimized for throughput (Layer 2).

Layer 1 networks typically prioritize:

- Security and decentralization
- Global settlement assurance
- High-value or final settlement flows

Layer 2 networks focus on:

- Transaction throughput
- Lower fees
- Faster confirmation times

For payment use cases, the distinction mirrors traditional finance:

- Layer 1 resembles gross settlement
- Layer 2 resembles netted execution

Stablecoin systems increasingly use a hybrid approach: high-volume transactions occur on Layer 2 environments, with periodic final settlement anchored to Layer 1. This architecture supports scale without sacrificing security—an essential requirement for enterprise and bank adoption.

2.3 From Card Networks to Programmable Payment Rails

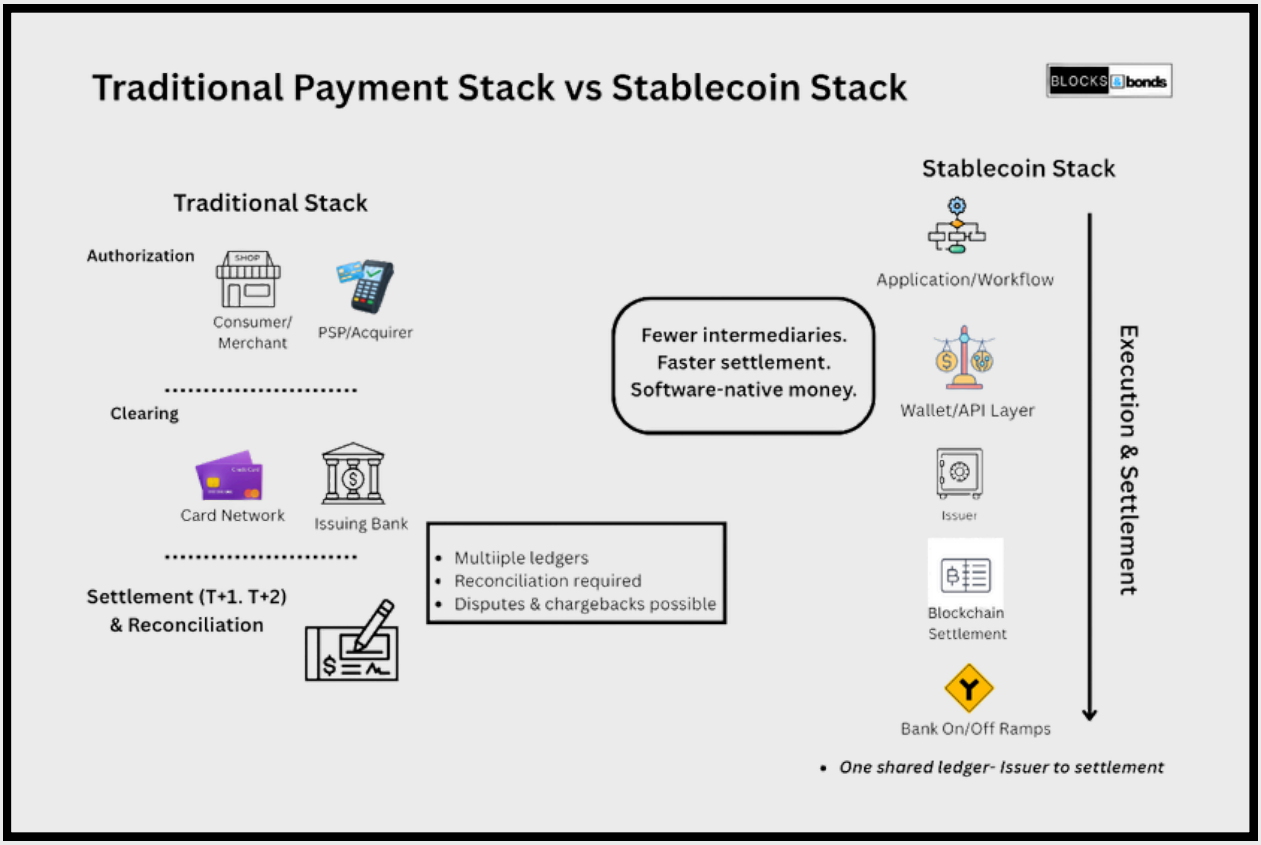
Traditional payment rails evolved to manage risk between parties who do not fully trust one another. Card networks, in particular, are optimized for consumer protection, fraud management, and dispute resolution—but at the cost of speed, transparency, and efficiency.

Feature	Traditional Rails	Stablecoin Rails
Settlement Time	Days	Minutes or seconds
Operating Hours	Limited	Always-on
Reconciliation	Required	Native
FX Handling	Multi-layerd	Embedded
Programmability	Minimal	Native

The result is not a replacement for cards or bank transfers, but an **alternative rail** better suited to:

- Cross-border B2B payments
- Treasury rebalancing
- Merchant settlement
- Global payroll
- Embedded finance applications

Where cards abstract settlement behind consumer convenience, stablecoins expose settlement as a programmable function.



2.4 Cross-Border Payments and FX Compression

Cross-border payments are one of the clearest areas where stablecoin rails outperform legacy systems. [5]

Traditional cross-border flows involve:

- Multiple correspondent banks
- Prefunding of nostro/vostro accounts
- FX spreads layered across intermediaries
- Delayed settlement and opaque fees

Stablecoins collapse this complexity.

By denominating transfers in a single digital settlement asset—most commonly USD-backed stablecoins—value moves directly between parties without intermediate currency conversions. FX occurs at the edge, not throughout the system.

This produces:

- Faster settlement
- Lower transaction costs
- Reduced counterparty risk
- Improved cash-flow predictability

For enterprises operating globally, this is not a speculative advantage—it is an operational one.

2.5 Settlement as Software

The most important distinction between stablecoin rails and traditional payment systems is programmability.

Stablecoin transactions can:

- Execute conditionally
- Trigger downstream accounting entries
- Enforce compliance logic
- Integrate directly with ERP and treasury systems

This transforms settlement from a back-office function into a real-time software process.

In practice, this means:

- Fewer intermediaries
- Reduced operational overhead
- New financial workflows that were previously impractical

The strategic implication is clear: the institutions that understand settlement as software—rather than as messaging—will define the next generation of payment infrastructure.

Section II Key Takeaway

Stablecoins are not disrupting payments by competing with consumer-facing products. They are doing so by rearchitecting settlement itself.

By repositioning blockchains as execution layers and stablecoins as settlement instruments, the payment stack becomes faster, simpler, and programmable. The transformation is incremental and largely invisible to end users—but foundational to the future of financial infrastructure.

Section III: Compliance, Regulation, and Control

From Permissionless Money to Policy-Aware Infrastructure

One of the most persistent misconceptions about stablecoins is that they exist outside the reach of regulation. In reality, stablecoins represent a shift not away from compliance, but toward a different compliance architecture.

Traditional financial systems embed compliance within institutions and intermediaries. Stablecoin systems embed compliance across issuers, smart contracts, wallets, and monitoring layers. Control does not disappear — it moves up and down the stack.

3.1 Compliance as a Design Feature

In payment-grade stablecoin systems, compliance is not optional or external. It is an architectural requirement.

Key compliance functions include:

- Customer identification and onboarding
- Transaction monitoring and risk scoring
- Sanctions enforcement
- Auditability and reporting

These functions are increasingly standardized at the issuer level, where stablecoin providers operate under licensing regimes similar to banks or payment institutions.[6] This centralization of responsibility allows regulators to supervise a smaller number of critical actors while maintaining visibility across the broader ecosystem.

The result is a paradoxical outcome: **open networks with centralized accountability.**

3.2 Issuer Level Controls: The New Gatekeepers

Stablecoin issuers sit at the center of the compliance model.

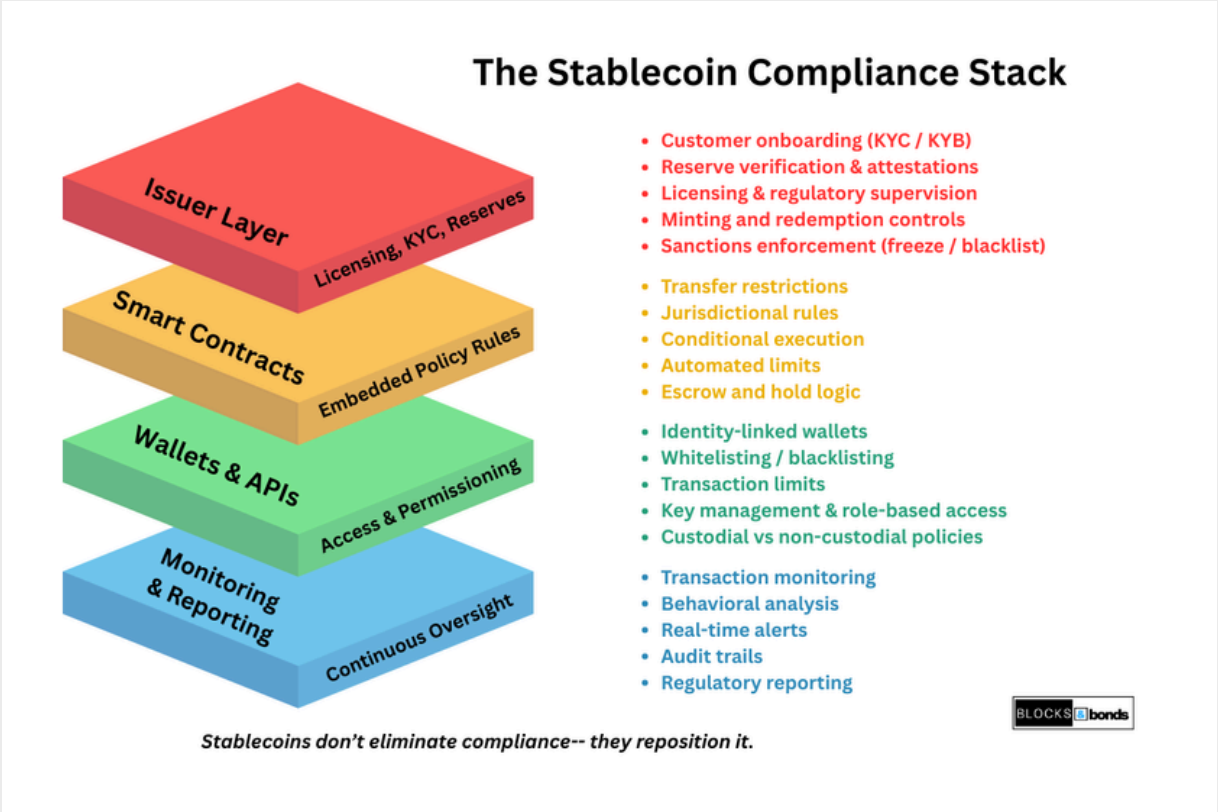
Core issuer responsibilities include:

Reserve management
- Ensuring full backing, liquidity, and transparency.

Minting and redemption controls
- Enforcing who can create or redeem stablecoins and under what conditions.

Sanctions and enforcement actions
- Freezing or blacklisting addresses when required by law.[7]

Disclosure and reporting
- Providing attestations, audits, and regulatory filings.



This places issuers in a role analogous to narrow banks or regulated payment institutions. While the underlying settlement layer may be decentralized, monetary trust is anchored to the issuer.

From a regulatory perspective, this concentration simplifies oversight. From a market perspective, it creates differentiation between speculative stablecoins and payment-grade infrastructure.

3.3 Wallet-Level Enforcement and Transaction Monitoring

Beyond issuers, compliance increasingly occurs at the wallet and service layer.

Wallet providers, custodians, and APIs implement:

- KYC and KYB requirements
- Address screening and behavioral analysis
- Transaction limits and risk thresholds
- Reporting tools for enterprises and banks

This mirrors traditional financial systems, where access points — not rails — enforce policy. The difference is that stablecoin systems can enforce rules programmatically, in real time, without relying on manual intervention or post-settlement reconciliation.

For enterprises, this enables:

- Granular transaction controls
- Automated audit trails
- Integration with internal compliance systems

3.4 Programmable Control: Smart Contracts as Policy Engines

Smart contracts introduce a new category of financial control: programmable policy enforcement.

Examples include:

- Conditional payments based on jurisdiction
- Automatic withholding or escrow
- Real-time compliance checks prior to execution
- Embedded reporting triggers

Rather than relying solely on ex-post enforcement, stablecoin systems increasingly support ex-ante compliance — rules enforced before settlement occurs.

This represents a meaningful shift:

- Less reliance on reconciliation
- Lower compliance costs at scale
- Reduced operational risk

In effect, compliance becomes software — not paperwork.

3.5 Regulatory Trajectories: From Ambiguity to Architecture

Across jurisdictions, regulatory approaches to stablecoins are converging around a shared principle: stablecoins that function like money should be regulated like payment instruments.[8]

Common regulatory themes include:

- Licensing of issuers
- Reserve segregation and transparency
- Redemption rights
- Consumer protections
- Ongoing supervision

While implementation varies by region, the broader direction is consistent. Regulators are distinguishing between:

- Experimental crypto assets
- Systemically relevant payment instruments

This distinction matters. It enables compliant stablecoins to integrate with banks, payment networks, and enterprise systems — while pushing non-compliant models to the margins.

3.6 Regulation as a Competitive Moat

Contrary to early assumptions, regulation is not slowing stablecoin adoption. It is shaping market structure.

As compliance requirements rise:

- Barriers to entry increase
- Trust consolidates around fewer issuers
- Institutional participation accelerates

This dynamic mirrors earlier phases of financial infrastructure development, from payment cards to electronic trading platforms. Over time, regulation does not eliminate innovation — it channels it.

For stablecoins, regulatory clarity is becoming a precondition for scale, not an obstacle to it.

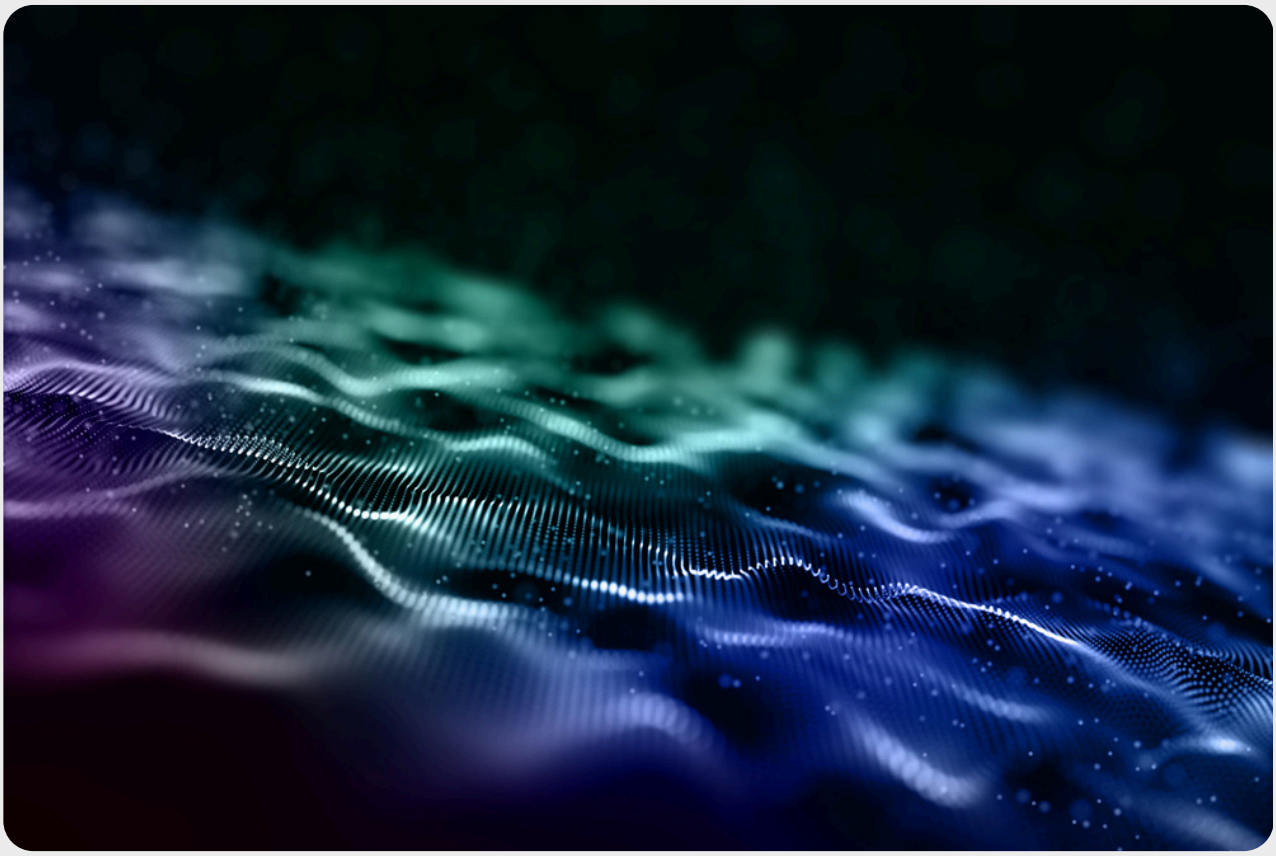
Section III Key Takeaway

Stablecoins do not represent a loss of financial control. They represent a reallocation of control across a programmable stack.

Compliance shifts:

- From intermediaries to issuers
- From manual processes to software
- From post-settlement review to pre-settlement enforcement

As a result, stablecoins are evolving into policy-aware financial infrastructure — capable of meeting regulatory standards while delivering operational advantages that legacy systems cannot.



Section IV: Bank Integration & Enterprise Adoption

Where Stablecoins Meet the Balance Sheet

Stablecoins do not succeed by bypassing banks and enterprises. They succeed by integrating with them.

As regulatory clarity improves and settlement infrastructure matures, the center of gravity for stablecoin adoption is shifting decisively toward institutions: banks embedding stablecoins into their infrastructure, and enterprises adopting them as payment and treasury tools. This phase is not driven by ideology or experimentation, but by operational efficiency.

4.1 Banks at the Crossroads: Compete, Adopt, or Abstract

1. **Compete: Bank-Issued Stablecoins**
Some banks are exploring issuing their own stablecoins, backed by deposits or segregated reserves. These instruments are typically:

- Permissioned
- Used for internal settlement or closed networks
- Integrated tightly with existing compliance frameworks

This approach maximizes control but limits network effects.

2. Adopt: Third-Party Stablecoins
Other banks integrate existing stablecoins as settlement assets, focusing on:

- Custody
- On/off-ramps
- Treasury services
- Payment facilitation

This model prioritizes speed to market and interoperability.

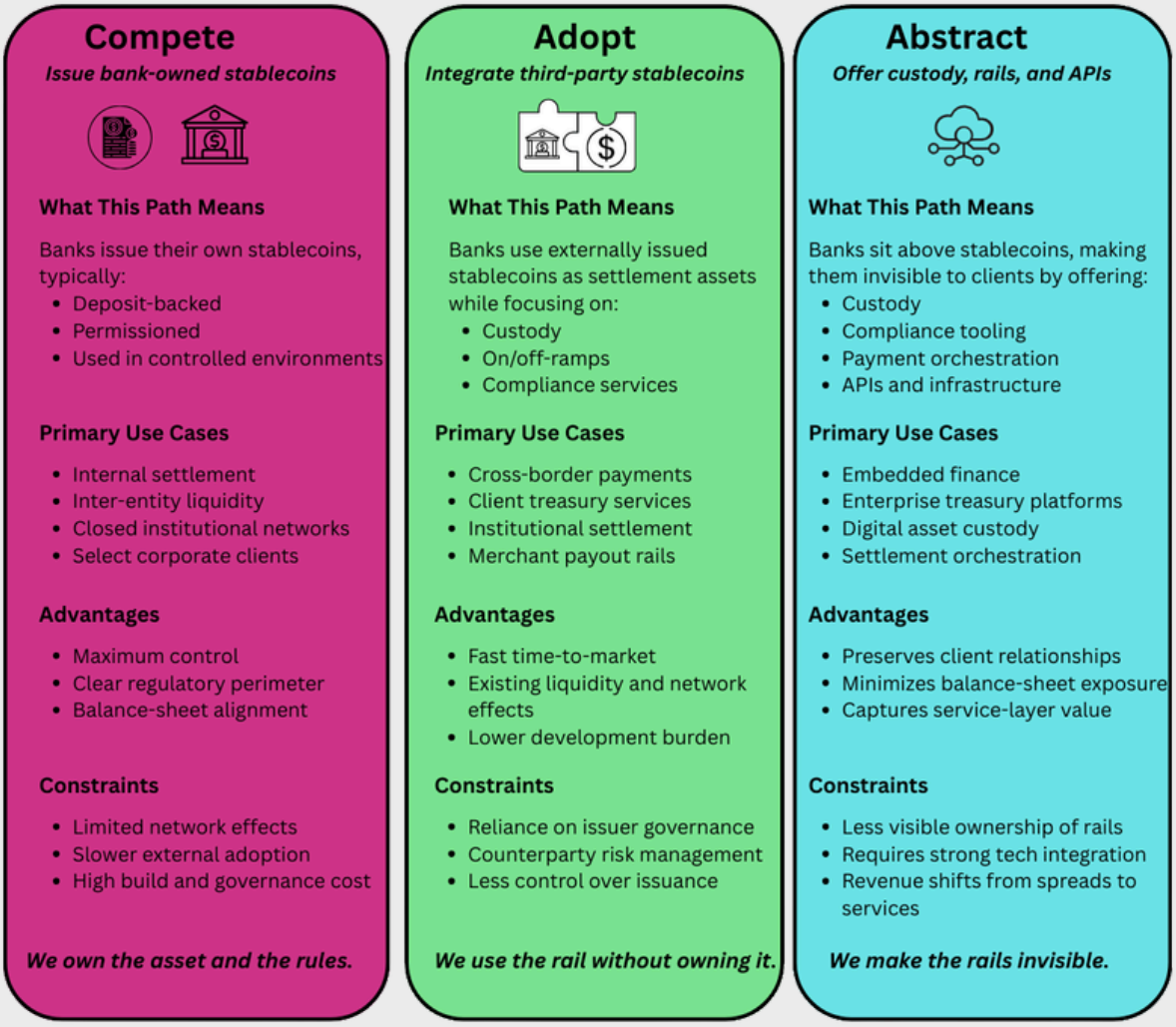
3. Abstract: Infrastructure and Services
A growing number of banks are positioning themselves above the stablecoin layer, offering:

- Digital asset custody
- Compliance-as-a-service
- Settlement orchestration
- Enterprise APIs

Here, stablecoins become rails — not products.

The core tension: Do banks defend deposits, or do they defend relevance?

In practice, most large institutions pursue **hybrid strategies**, combining elements of all three.



4.2 Stablecoins Inside the Bank: Internal Settlement and Treasury

One of the least visible — but most impactful — use cases for stablecoins is internal bank operations.

Banks increasingly experiment with stablecoins for:[9]

- Inter-entity settlement
- Liquidity management
- Nostro/vostro optimization
- After-hours settlement

Because these flows occur behind the scenes, they attract less public attention. Yet they often deliver the strongest ROI. By reducing reconciliation complexity and enabling near-real-time settlement, stablecoins act as **internal efficiency layers**, not consumer-facing products.

This mirrors earlier infrastructure shifts in finance, where operational tooling preceded customer innovation.

4.3 Enterprise Adoption: Payments, Not Crypto

For enterprises, stablecoin adoption is largely pragmatic.

Most businesses do not want exposure to crypto markets, token governance, or protocol risk.

What they want is:

- Faster settlement
- Lower fees
- Predictable cash flow
- Reduced FX friction

Stablecoins increasingly meet those needs.

Primary enterprise use cases include:[10]

Cross-border B2B payments

- Reducing intermediaries and settlement delays.

Treasury management

- Holding and moving liquidity across jurisdictions.

Global payroll and contractor payments

- Especially in regions with underdeveloped banking infrastructure.

Merchant settlement

- Faster access to funds compared to card-based systems.

In each case, stablecoins function as payment instruments, not speculative assets.

4.4 Integration with Existing Systems

A critical factor in enterprise adoption is abstraction.

Stablecoins gain traction not when businesses interact directly with blockchains, but when they integrate through familiar tools:

- Treasury management systems
- ERP software
- Payment APIs
- Banking portals

This is why banks, fintechs, and infrastructure providers play an outsized role. They translate blockchain-native settlement into enterprise-native workflows.

The winning implementations are largely invisible:

- No wallets to manage manually
- No private keys exposed to end users
- No operational crypto expertise required

From the enterprise perspective, the experience resembles a faster, more flexible version of existing payment rails.

4.5 Risk, Governance, and Internal Controls

Institutional adoption depends as much on governance as on technology.

Enterprises and banks evaluate stablecoin systems through familiar lenses:

- Counterparty risk
- Liquidity risk
- Operational resilience
- Regulatory exposure

As a result, adoption tends to favor:

- Highly regulated issuers
- Transparent reserve structures
- Strong redemption guarantees
- Mature compliance tooling

This reinforces a broader pattern: **institutional adoption concentrates around fewer, more trusted stablecoin providers.**

4.6 The Feedback Loop: Institutions Drive Infrastructure Maturity

As banks and enterprises adopt stablecoins, they exert pressure on the entire ecosystem:

- Higher uptime and reliability standards
- Improved compliance tooling
- Better integration APIs
- Stronger governance models

This creates a feedback loop:

1. Institutional demand raises standards
2. Higher standards reduce risk
3. Lower risk accelerates adoption

Over time, stablecoins evolve from optional tools into **default infrastructure components** for certain categories of payments.

Section IV Key Takeaway

Stablecoins are not winning adoption by appealing to consumers or displacing banks. They are doing so by solving institutional problems at the infrastructure level.

For banks, stablecoins are becoming tools for settlement, efficiency, and service expansion.

For enterprises, they are becoming faster, more flexible payment rails.
The institutions that treat stablecoins as plumbing rather than products will be best positioned to capture their long-term value.

Section V: The Emerging Stablecoin Stack — and What Comes Next

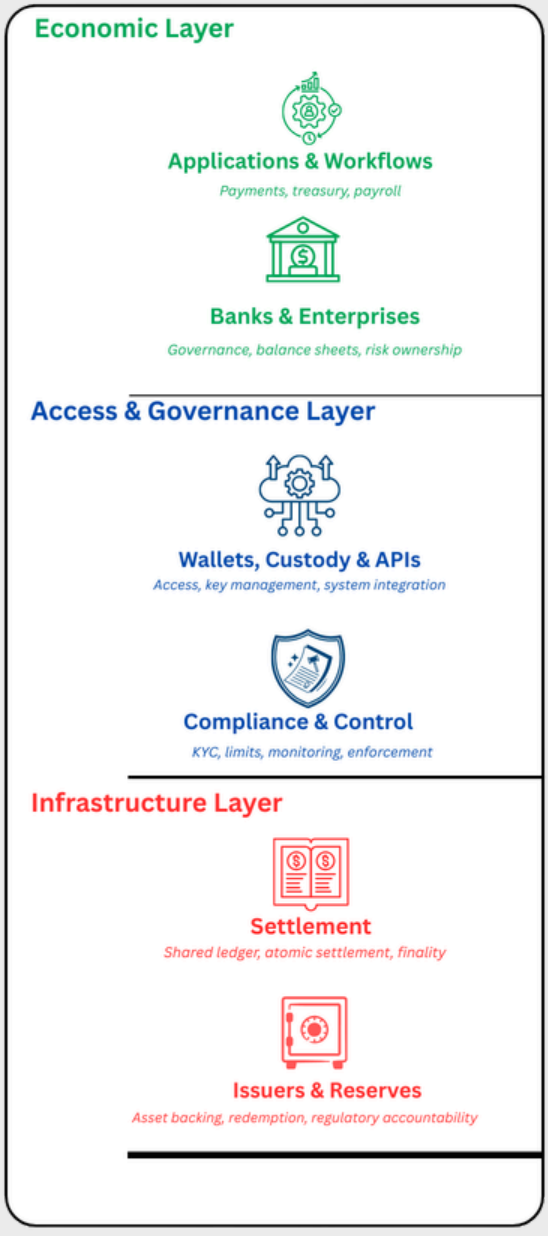
From Components to Infrastructure

Taken individually, stablecoin issuers, blockchains, compliance tools, and bank integrations can appear fragmented. Viewed together, they form a coherent system: a new financial stack for digital settlement.

This section consolidates the report's analysis into a single framework and outlines how that stack is likely to evolve over the next 12–36 months.

5.1 The Stablecoin Stack (Unified Framework)

The Stabelcoin Stack



The stablecoin ecosystem is best understood as a layered stack, where each layer performs a distinct function and captures different forms of value.

The Stablecoin Stack

1. Applications & Workflows
Payments, payroll, merchant settlement, treasury operations, embedded finance.

2. Banks & Enterprises
Custody, liquidity management, compliance oversight, and integration into existing financial operations.

3. Wallets, Custody & APIs
Secure access, transaction execution, identity controls, and system connectivity.

4. Compliance & Control
KYC/AML, sanctions screening, transaction monitoring, programmable enforcement.

5. Settlement Layer
Public or semi-public blockchains providing finality, availability, and execution.

6. Issuers & Reserves
Monetary trust, asset backing, redemption guarantees, and regulatory accountability.

This stack clarifies a key point: stablecoins are not a single product category. They are an ecosystem of interdependent services, each subject to different competitive and regulatory dynamics.

5.2 Where Value Accrues — and Where It Doesn't

Not every layer captures value equally.

- Issuers benefit from scale, trust, and regulatory clarity.
- Compliance and control providers gain leverage as institutions demand programmable enforcement.
- Banks and enterprise integrators retain power by abstracting complexity.
- Settlement layers compete on reliability, cost, and neutrality — often commoditizing over time.

Consumer-facing applications, by contrast, are less defensible unless tightly integrated into enterprise workflows. This mirrors earlier infrastructure cycles in payments and cloud computing, where durable value accrued above and around core rails.

5.3 Tokenized Deposits vs Stablecoins

A growing discussion centers on tokenized bank deposits as alternatives to stablecoins. While structurally similar, the distinction is meaningful.

- **Stablecoins**
  - Issued by regulated non-banks or specialized entities
  - Designed for interoperability
  - Optimized for global settlement
- **Tokenized deposits**
  - Issued directly by banks
  - Tied to existing deposit frameworks
  - Often permissioned and closed-loop

In practice, these models are likely to coexist. Stablecoins favor open, cross-border use cases. Tokenized deposits favor internal bank and domestic settlement. Over time, interoperability — not dominance — will define success.

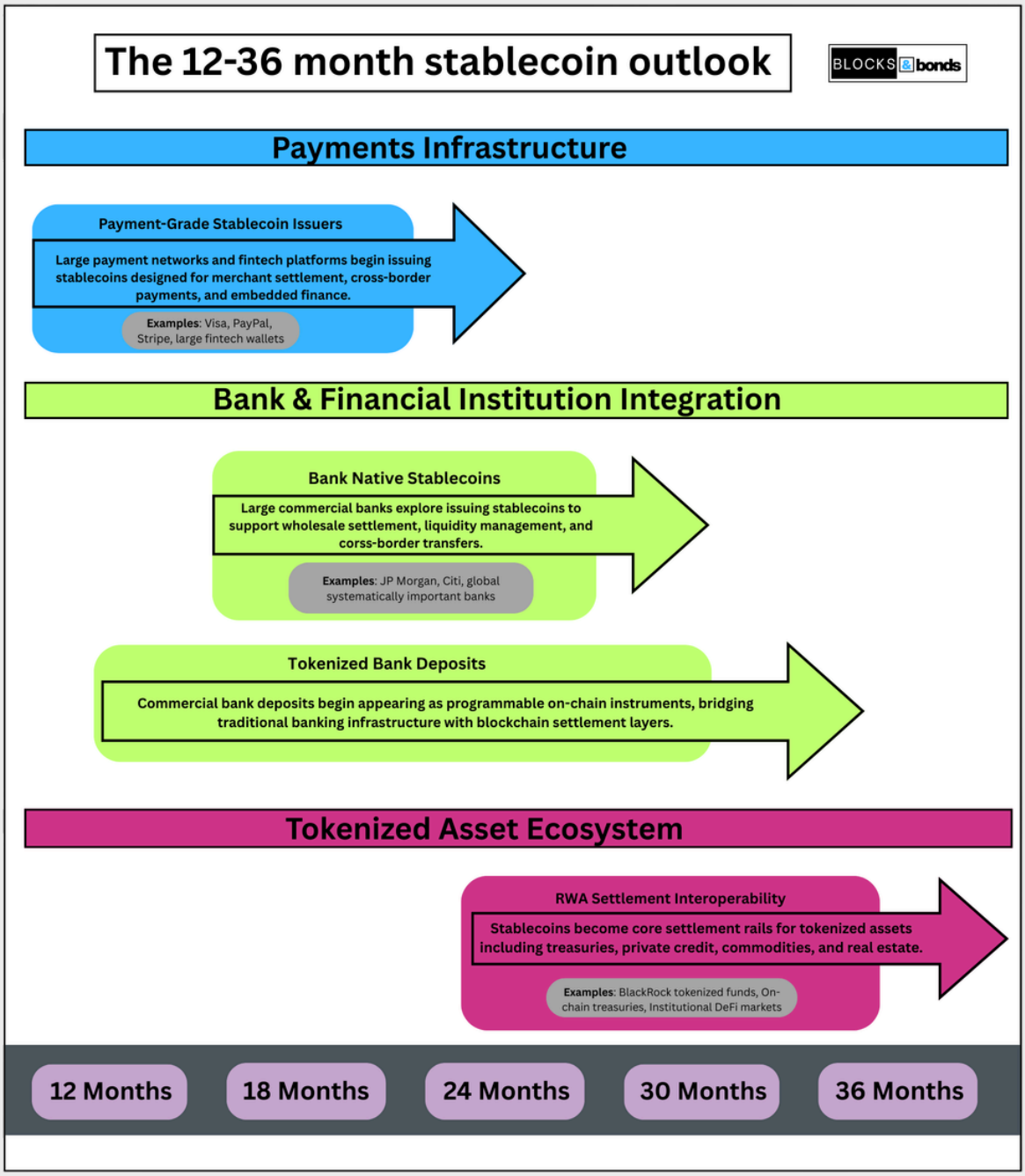
5.4 Interoperability with Tokenized Assets

Stablecoins are increasingly becoming the default settlement asset for tokenized real-world assets (RWAs), including: [11]

- Treasury instruments
- Commercial paper
- Fund shares
- Trade finance assets

As asset tokenization grows, the need for a neutral, programmable settlement instrument becomes unavoidable. Stablecoins fill this role naturally, reinforcing their position at the center of digital financial infrastructure.

5.5 The 12–36 Month Outlook



Several developments are likely to define the next phase of the stablecoin stack:

Payment-grade issuance becomes standard
- Fewer issuers, higher regulatory standards, deeper institutional trust.

Bank-native integrations expand
- Stablecoins embedded in treasury platforms, custody offerings, and settlement systems.

Cross-border rails normalize
- Stablecoins become default back-end rails for global payments, even when invisible to end users.

Programmable compliance matures
- Policy enforcement shifts further from manual review to real-time software controls.

Infrastructure fades into the background
- Stablecoins succeed most when users don't notice them.

5.6 Strategic Implications

For institutions, the strategic question is not whether stablecoins will persist, but where to engage in the stack.

- Banks must decide whether to issue, integrate, or orchestrate.
- Enterprises must decide whether to experiment tactically or redesign payment workflows.
- Policymakers must decide how to supervise systems that blur traditional institutional boundaries.

The organizations that move early — and thoughtfully — will shape standards, capture integration advantages, and influence regulatory outcomes.

Conclusion: The New Payment Rails Are Already Here

Stablecoins are not a future promise. They are already functioning as settlement infrastructure for a growing share of global value transfer.

Their impact will not be measured by consumer adoption curves or speculative cycles, but by quieter metrics:

- Settlement speed
- Cost reduction
- Liquidity efficiency
- Operational resilience

In that sense, stablecoins resemble every major financial infrastructure shift that came before them. Transformative not because they are visible — but because, once embedded, they become indispensable.

Endnotes

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About Blocks & Bonds

Blocks & Bonds is an independent research platform focused on the infrastructure of digital finance. Our work examines the intersection of blockchain networks, tokenized assets, payment systems, and institutional market structure.

We publish flagship research reports, briefs, and explainers designed to help financial institutions, enterprises, and policymakers understand the evolving architecture of digital money and financial infrastructure.

Our research focuses on three core areas:
• Digital payment rails and stablecoins
• Tokenized real-world assets and capital markets
• Institutional adoption of blockchain infrastructure

Blocks & Bonds combines market analysis, technical understanding, and policy awareness to provide clear frameworks for navigating the next generation of financial infrastructure.

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