REPORT

Blockchain for banks

Is the financial system ready for an upgrade?



Roland Berger

Management summary

Today's banking system presents itself as fully digital, yet its core settlement architecture remains rooted in systems designed decades ago. Customers experience seamless mobile interfaces and continuous access, but behind the screen transactions are still constrained by operating-hour windows and reconciliation cycles that reflect a different technological era. International payments can take several days to clear, and capital remains tied up in buffers that compensate for delayed synchronization between institutions. The system functions reliably, but in a market increasingly shaped by real-time expectations, its built-in constraints are becoming harder to ignore.

Blockchain technology enables shared-ledger settlement in real time at costs and speeds suitable for production volumes, and could provide the structural upgrade that banking infrastructure requires. At the same time, competitive pressure is intensifying. The American Banking Association has claimed that as much as USD 6.6 trillion in bank deposits could be at risk if adoption of stablecoins continues unabated. Many banks have begun experimenting with blockchain, yet most activity remains confined to pilots and token gestures. The strategic challenge is therefore to move beyond experimentation while remaining compliant and managing risk.

Meeting that challenge calls for disciplined execution. Banks must focus on areas where settlement friction has a clear economic cost. They should consider building dedicated digital assets capability with senior sponsorship. The transition must move from contained pilots to scalable implementation. Technology choice needs to follow strategic intent and regulatory context. In other words, rewiring settlement for a real-time economy requires treating blockchain not as experimentation, but as infrastructure.

Cover: JuSun/iStock

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Fast facts

~90%

The cost reduction achievable with stablecoin-based transfers vs. conventional wire transfers.

~300

mentions of stablecoins in SEC filings during 2025.



Bank deposits worth an estimated USD 6.6 trillion are at risk if stablecoin adoption continues.

1 Banking infrastructure under strain

A model built for a different era

For all the innovation visible in mobile apps and digital channels, the core infrastructure of banking still runs on settlement architecture designed in previous decades. Clients experience instant payments and continuous access, yet the underlying systems continue to rely on operating-hour constraints and batch reconciliation. These mechanisms were built to ensure stability and control, but in an environment defined by capital pressure and margin compression they now tie up capital and slow down settlement.

Banking exists to move capital efficiently. That requires transfers within institutions and across jurisdictions to settle predictably and without unnecessary delay. Yet inefficiencies remain embedded in interbranch settlement, interbank flows, cross-border transfers and operational areas such as lending and trade finance. Over time, these frictions have become part of the operating model. They work, but they carry a cost in liquidity and effort. ▶ A

1. Interbranch and interbank settlement

Even when transactions appear instant to customers, reconciliation and balance sheet synchronization often take place later. The front end may operate in real time, but the ledger frequently catches up afterwards, and that gap creates timing mismatches that require liquidity buffers and reduce the productive use of capital. Interbank settlement operates under similar constraints. Despite modernization efforts, settlement still depends on reconciliation cycles and operating-hour limitations, which in turn compel banks to maintain elevated liquidity buffers to absorb timing gaps, tying up capital that could otherwise be deployed. At the same time, large back-office teams continue to reconcile transactions manually, and 0.8-1.8 percent of manually reconciled accounts are subject to error.[1] These processes are familiar and generally reliable, but they build delay and capital drag into the system.

1 Trintech; *Why A Traditional, Manual Balance Sheet Reconciliation Process Is Risky For Your Organization*

2. Cross-border transfers

Cross-border transfers show a similar pattern. International payments are routed through intermediary and correspondent banks operating across different time zones and regulatory regimes, with each intermediary performing compliance checks before funds reach their destination. Settlement can range from a number of hours to several days, and fees accumulate along the chain. Transparency remains limited, with senders and receivers often unsure where funds sit until they have fully cleared. Regional instant payment systems exist in selected corridors. Even so, most international transfers, particularly those involving currency conversion, still rely on correspondent structures.

3. Loans

Timing gaps are also evident in loan servicing. Loan systems frequently rely on asynchronous updates across departments, so that a payment recorded in collections may not be reflected across the bank in real time. This creates temporary mismatches and limits responsiveness. According to Solifi, financial institutions with outdated systems spend approximately 22 percent more on loan-related operations due to internal inefficiencies.[2] In practical terms, fragmented loan data and manual reconciliation remain part of everyday processing.

2 Solifi; *The Costly Price of Delay: Why Upgrading Lending Operations Cannot Wait*

4. Escrow

Escrow processes likewise rely on legacy infrastructure and time-consuming manual verification, with buyers and financial institutions maintaining separate records across independent systems. Verification of contractual milestones typically requires documentation exchange before funds are released. Closing processes frequently take as much as 30-45 days.[3] Back-office teams monitor accounts and confirm documentation, while transaction data remains spread across systems.

3 Redfin; *What Is "Close of scrow"? Timeline, Process, and What To Expect*

5. Trade finance

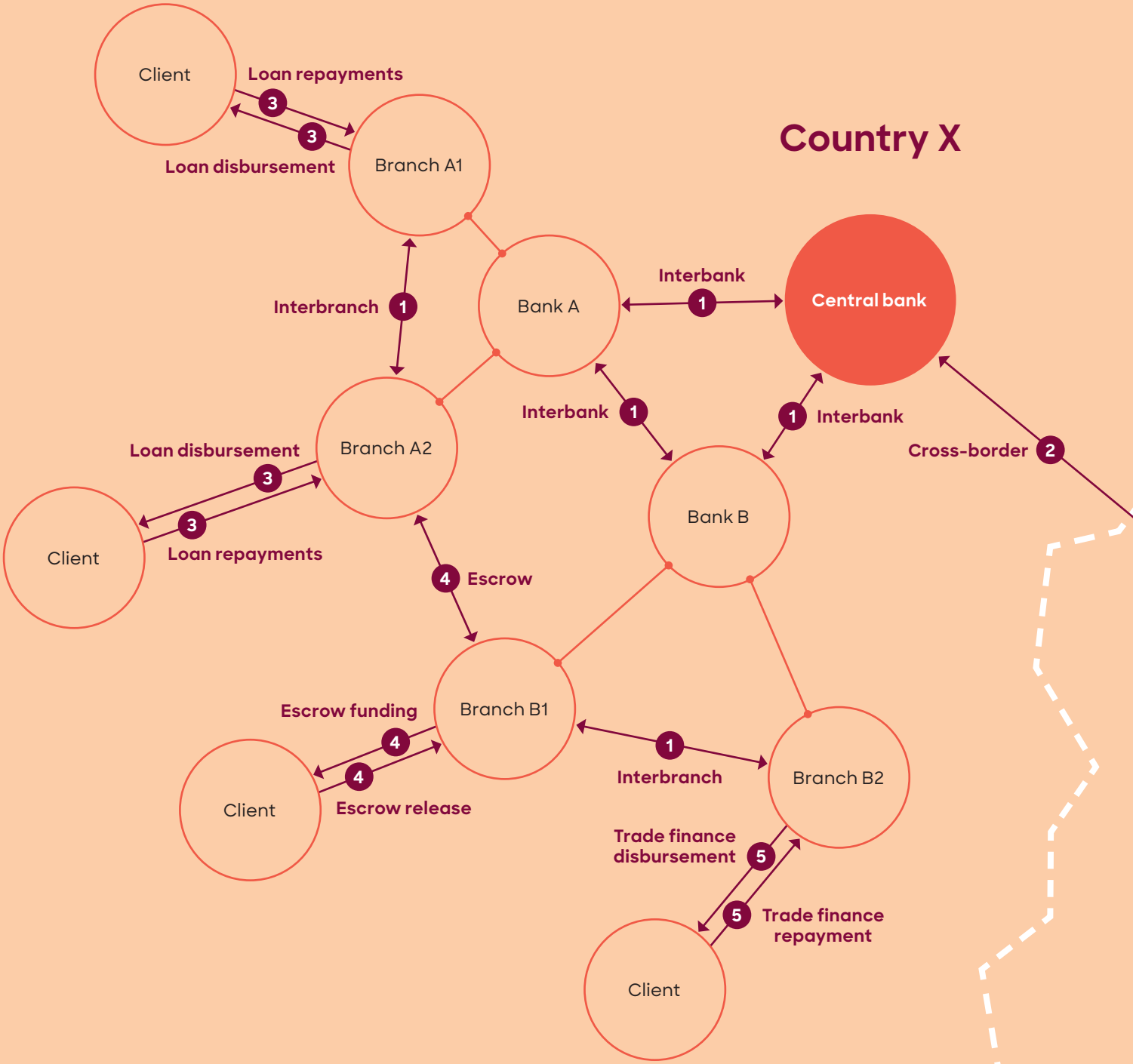
Trade finance remains heavily manual and document-driven. Transactions involve exporters, importers and banks that operate distinct record-keeping and compliance systems. Because these systems are rarely integrated, verification requires repeated document checks before capital can move. Nearly 45 percent of SMEs and 17 percent of multinationals face rejection when applying for trade finance, according to an OECD survey.[4] Paper-based processes and repeated screening increase administrative workload and delay the movement of working capital.

4 OECD; *Trade finance for SMEs in the digital era*

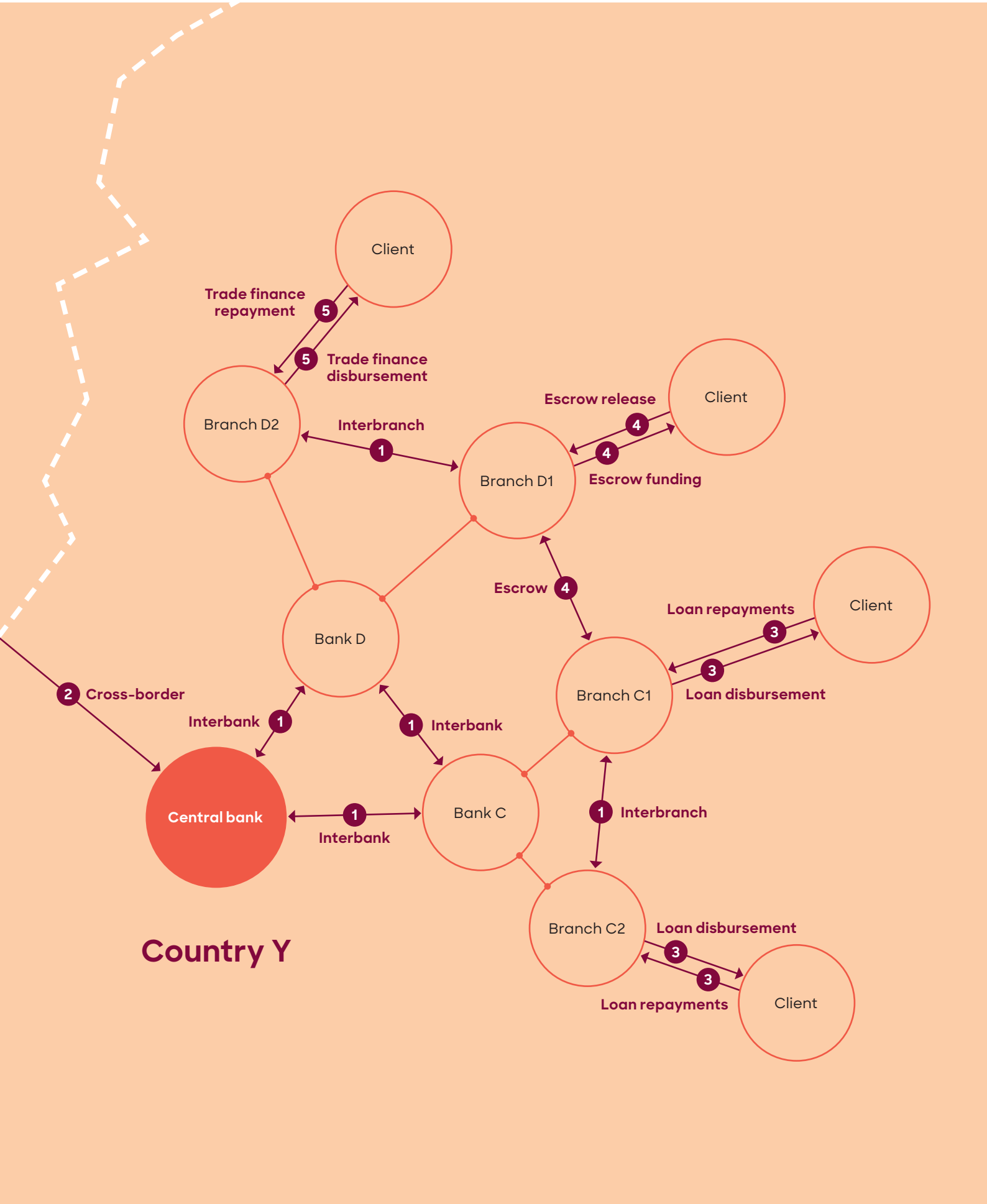
In every case, the issue is the same: Settlement delay and reconciliation effort are built into the operating model rather than arising from isolated weaknesses. For decades, the system has operated effectively – and often profitably – within these parameters. The question now is, can an architecture that ties up capital and slows down settlement meet the demands of a market increasingly shaped by real-time expectations?

A Multiple layers, separate ledgers

Interbank and cross-border transaction flows



Source: Roland Berger


Client
Trade finance repayment
5
5
Trade finance disbursement
Branch D2
Interbranch
1
Escrow release
Client
4
4
Escrow funding
Branch D1
Escrow
4
Loan repayments
Client
3
3
Loan disbursement
Bank D
Branch C1
2
Cross-border
Interbank
1
1
Interbank
Central bank
1
Interbank
Bank C
1
Interbranch
Branch C2
Loan disbursement
3
3
Loan repayments
Client
Country Y

2 How blockchain reshapes settlement architecture

A structural response

The inefficiencies outlined in the previous chapter are not the result of isolated process failures: they stem from an architecture built around separate ledgers, sequential reconciliation and operating-hour constraints. Blockchain technology addresses these constraints at the architectural level. Rather than coordinating across multiple independent records, it enables participants to operate on a shared ledger that updates in real time.

Blockchains are decentralized ledgers that allow transactions to be recorded, verified and synchronized across participants without requiring a central intermediary to reconcile accounts after the fact. Because they operate on internet-based infrastructure, they run continuously. While blockchain technology has existed for around 15 years, transaction speed and cost were previously limiting factors.

Recent developments, including Layer 2 solutions on Ethereum and faster Layer 1 blockchains such as Solana, Hedera, Avalanche and Sui, have materially improved performance. Transactions can now be executed for under a cent and settled within seconds. Blockchain-based systems are now fast and inexpensive enough to address many of the structural frictions embedded in the current banking model. We discuss its application in different areas below.

Interbranch settlements and tokenized deposits

Reconciliation between branches currently depends on batch processing and delayed ledger alignment. Blockchain offers a different operating model: instead of running overnight reconciliation cycles, a bank can deploy a private blockchain network in which each branch operates as a node with read and write access. When a customer at one branch withdraws funds deposited at another, the transaction is recorded on a shared ledger and becomes immediately visible across the network.

Because balances update simultaneously, the delay inherent in batch processing is removed. JPMorgan's Interbank Information Network, now rebranded as Liink, demonstrated that shared ledger technology can reduce payment delays and inquiry resolution times from weeks to hours.[5] More recently, BNY announced that it was tokenizing deposits using the Canton blockchain. Tokenized deposits, representing actual client balances on a blockchain, can move continuously between branches, reducing internal settlement friction. As this model operates within a single institution, it does not depend on external coordination and can therefore be implemented comparatively quickly.

The strategic urgency behind tokenized deposits extends beyond operational efficiency. As private stablecoins such as USDT and USDC attract growing transaction volumes, they threaten to disintermediate banks from the payments value chain entirely. Tokenized deposits allow banks to offer the same programmability and near-instant settlement that stablecoins provide, while keeping funds within the regulated banking system and preserving the deposit base that underpins their lending capacity. JPMorgan has gone furthest, launching its JPM Coin deposit token through its Kinexys division - first on its private permissioned blockchain and now on Coinbase's Base public chain - enabling institutional clients to send and receive tokenized dollar deposits around the clock.

5 FinTech Magazine; *Blockchain Technology and Modern Banking Systems*

Interbank transfer and blockchain for Real Time Gross Settlement (RTGS)

In the case of interbank settlements, instead of routing transactions through correspondent chains or relying on end-of-day netting, participating banks can record obligations on a consortium blockchain accessible to authorized members. The blockchain layer sits above existing core systems and connects through APIs, allowing synchronization without requiring a wholesale replacement of legacy infrastructure.

This approach has already been tested in practice. The Monetary Authority of Singapore's Project Ubin explored distributed ledger technology for RTGS for interbank payments and securities settlement, demonstrating settlement in T+0 rather than T+1 or T+2.[6] By recording transactions once on a shared ledger, institutions compress settlement cycles and reduce the need for timing buffers. Banks can join existing networks or form new consortia with clearing partners depending on their strategic positioning. Indeed, many central banks are now considering blockchain as the underlying technology for their RTGS systems.

6 Consensys Solutions; *Project Ubin: Blockchain Case Study for Banking in Singapore*

Unlocking liquidity with tokenised loans

A shared blockchain ledger can also function as a single source of truth for loan data. When a borrower makes a payment, the update is recorded once and reflected immediately across relevant departments. All authorized participants reference the same synchronized dataset rather than reconciling separate records.

Versana illustrates this model in syndicated lending. Backed by major banks, the platform provides real-time visibility into loan positions, repayments and accruals for participating lenders.[7] As of 2023, it had processed more than 1,500 syndicated loans totaling over USD 900 billion.[8]

Beyond loan servicing and syndicated lending, blockchain also addresses two structural inefficiencies in short-term financing: repo settlement and delivery versus payment (DvP). In a tokenized repo, both the cash and collateral legs are represented as digital tokens on a shared ledger, enabling smart contracts to execute simultaneous transfers – providing intraday liquidity without overnight settlement lags and manual collateral management. Similarly, DvP settlement – the requirement that securities transfer only upon confirmed payment – has traditionally been a multi-day process carrying principal risk. On blockchain, both legs execute atomically – meaning either both complete or neither does – eliminating counterparty exposure entirely. JPMorgan demonstrated this in its collaboration with Ondo Finance and Chainlink, achieving cross-chain DvP settlement of tokenized securities with near-real-time finality.[9]

Tokenizing loans have the added advantage of creating liquidity from an otherwise illiquid asset. Doing so enables banks to create value from trading and liquidity management, in a manner similar to collateralized debt obligations (CDOs).

7 Versana; *The Syndicated Loan Market, Modernized*

8 Ledger Insights; *Syndicated loan platform founded by BofA, Citi, JP Morgan logs 1,500 loans*

9 Chainlink; *How the Chainlink Runtime Environment Enables Cross-Chain DvP Settlement of Tokenized Assets With Kinexys*

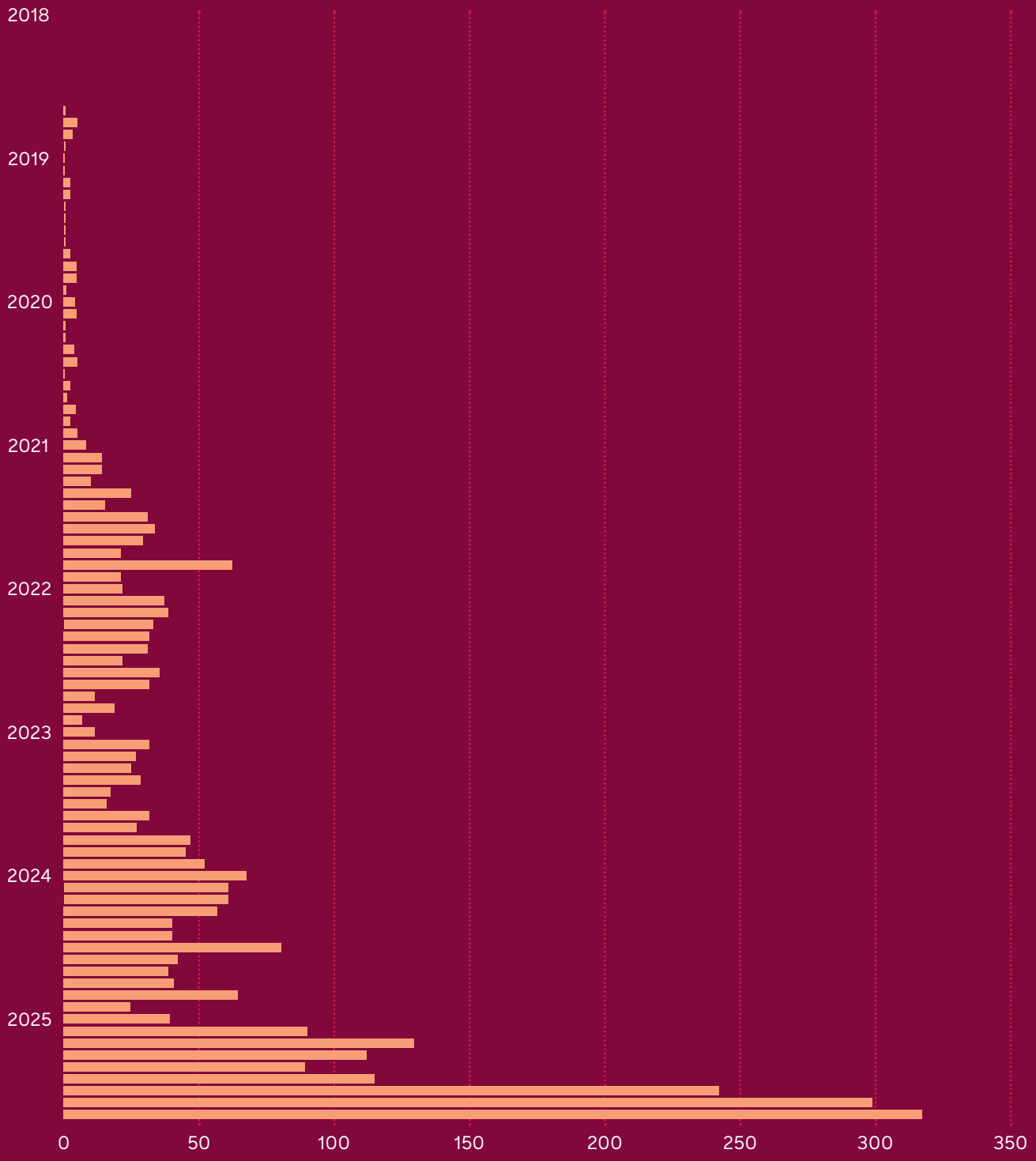
Cross-border transfers using stablecoins or CBDC

Cross-border transfers are particularly suited to shared ledger settlement. Instead of moving through multiple intermediaries, transactions can be recorded directly on blockchain infrastructure between participating institutions, reducing reliance on correspondent chains.

Two models have emerged. The first uses stablecoins as a settlement instrument – and is currently gaining institutional attention. A bank converts local currency into a stablecoin such as USDC or USDT, transfers the stablecoin onchain (virtually instantly) to the blockchain wallet of the receiving institution, which then converts it back into fiat currency. The process can be

B Accelerating institutional attention to stablecoins

Mentions of stablecoins in SEC filings, 2018-25



Source: The Block, Roland Berger

completed in under a minute and at a significantly lower cost than traditional wire transfers – indeed, Keyrock reports that stablecoin-based transfers can be up to 90 percent cheaper than conventional wires.[10] The growing frequency with which stablecoins appear in corporate disclosures reflects this shift from fringe innovation to operational consideration. ▶B

10 Keyrock; *What are Remittances with Stablecoins? A guide*

This model depends on regulated on-ramp and off-ramp providers that manage conversion, maintain reserves and ensure compliance. Providers such as BVNK supply this infrastructure, allowing banks to access stablecoin rails without building conversion capability internally.

The second model involves direct blockchain settlement of sovereign currencies. Project mBridge, a collaboration between the central banks of China, Hong Kong, Thailand, the United Arab Emirates, Saudi Arabia and the Bank for International Settlements, has piloted cross-border central bank digital currency transactions on a shared distributed ledger. The project has processed over USD 55 billion in real-value transactions, demonstrating that central banks can settle directly without correspondent banking intermediaries, provided appropriate conversion infrastructure connects digital currency and fiat systems.

Streamlining trade finance with blockchain

Trade finance shows how blockchain can reduce document-driven delay. Platforms digitalize trade documentation and store it on a shared ledger that is accessible to authorized participants. Smart contracts automate verification by checking whether predefined conditions have been met before triggering payment.

When an exporter uploads an electronic bill of lading, for example, a smart contract can validate it against letter of credit terms and release payment once shipment conditions are confirmed. All authorized parties – buyer, seller, shipping company, customs authority or bank – can view document status in real time, reducing the need for sequential verification. WaveBL provides a practical example. When an exporter presents an electronic bill of lading, the platform records it on-chain and makes it visible to relevant parties. Smart rules validate terms against shipment data, enabling financing or payment upon verified events.[11] The platform has recorded more than one million electronic bill of lading issuances.

Automated escrow using smart contracts

Escrow arrangements can be automated through smart contracts that hold funds on blockchain infrastructure and release payment once predefined conditions are verified. Rather than relying on manual confirmation by an escrow agent, execution is triggered automatically when an authoritative event is recorded.

In a real estate transaction, a buyer deposits funds into a smart contract at offer acceptance. Once title transfer is recorded on a blockchain-based registry, the contract releases payment to the seller. In trade scenarios, funds can be released when shipment confirmation is registered. Propy has executed property transactions using this model, reducing closing times from 30-45 days to as little as 24 hours in some cases.[11] Banks can integrate similar functionality into existing escrow services by connecting smart contracts to verified data sources such as property registries or shipping systems.

11 Propy AI; *AI assisted title and escrow onchain for real estate*

Across these applications, blockchain does not change the product – it changes how settlement occurs. Transactions are recorded once and made visible immediately, rather than reconciled across separate systems later.

3 Turning blockchain into value

A playbook for banks

Blockchain technology is not new: it has been available for more than a decade, and multiple banking pilots have demonstrated technical feasibility. Project Ubin, JPMorgan's Liink and Versana all proved that shared ledger models can function in real-world settings. Yet adoption remains limited, and few initiatives have translated into system-wide transformation. The constraint today is not proof of concept, but institutional execution.

Over time, banks have optimized processes, controls and governance around legacy infrastructure. These systems may be dated, but they are resilient and deeply embedded in operating models. Moreover, ageing legacy infrastructure means that most banks are continuously firefighting to ensure these systems continue to run. Combined with a low appetite for operational risk, this creates natural resistance to replacing core settlement mechanisms, particularly with technology that enables continuous, 24/7 operations.

At the same time, competitive pressure is increasing. Neobanks such as Revolut have already built digital-native infrastructures, and blockchain-based applications including stablecoins and digital wallets continue to gain traction. The rise of yield-bearing stablecoins has raised concerns within the industry – indeed, the American Banking Association estimates that as much as USD 6.6 trillion in bank deposits could be at risk if stablecoin adoption accelerates. The strategic issue is thus not whether blockchain works, but how banks can successfully implement it.

FOUR STEPS TO IMPLEMENTATION



1 Prioritize pain points and high-impact business cases

The first step is to quantify the greatest sources of financial drain, customer friction or risk of inaction. Banks can do this by carrying out a data-driven assessment of the true cost of inefficiency, not only direct operational expenses in personnel and system maintenance, but also the hidden cost of trapped liquidity in correspondent banking – and the opportunity cost created by slow settlement. By isolating one or two high-impact problems, banks can develop a strategy that concentrates resources where there is a clear ROI and avoid engaging in initiatives that lack measurable return.



2 Establish a digital assets team with top-level sponsorship

Once they have prioritized the major pain points, banks need to build their execution capability. A dedicated digital assets team can act as a bridge between technology, finance and compliance, developing the strategy and implementation roadmap. Without such coordination, initiatives often stall between functions. Top-level sponsorship is critical, as digital asset programs are frequently met with skepticism across established banking structures. Clear executive backing reduces internal resistance and signals institutional commitment.

3

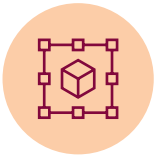
Select targeted use cases that scale



The next step is to translate prioritized pain points into a well-defined pilot. Rather than attempting a full-scale overhaul, the pilot should be contained, for example within a specific currency corridor or product line, and supported by clearly defined success metrics. A key decision is whether to build a proprietary solution or participate in an existing blockchain consortium. Leveraging established networks, particularly in trade finance or regulated stablecoin payments, can accelerate deployment and reduce integration complexity while allowing the bank to test measurable impact.

4

Pick the right blockchain



The choice of blockchain should be based on the use case and regulatory requirements. Public networks such as Ethereum offer transparency, liquidity and access to a broad developer ecosystem, and recent performance improvements have reduced fees and increased settlement speed. At the same time, banks' privacy and compliance obligations may make private or permissioned configurations more appropriate. Institution-grade platforms such as Canton, as well as permissioned instances on networks including Solana, Polygon, Avalanche and Hedera, provide alternative models. Often, a multi-chain approach will make sense. The determining factor is alignment between the technology architecture and the operational and regulatory context in which it will be deployed.

Together, these steps form a practical playbook for moving from experimentation to implementation. Blockchain does not create value by default – value emerges when clearly defined use cases are aligned with institutional priorities and supported by appropriate governance. The difference between pilot activity and measurable impact lies in execution discipline.

Conclusion

Blockchain-based settlement technology exists, and pilots have proven its viability in real-world banking environments. The efficiency gains are measurable. Yet a fundamental question remains: Will banks adopt shared ledger models at scale, or will they continue to resist?

The uncomfortable truth is that parts of the current system are profitable precisely because they are inefficient. Cross-border transfer fees and float income generated during settlement delays produce billions in annual revenue. A three-day international transfer may be a frustration for customers, but it also allows banks to earn interest on funds in transit. Introducing blockchain-based settlement would compress those revenue streams – which helps explain the industry's caution.

But competitive pressure is intensifying. If incumbent banks do not modernize, others will. Neobanks and FinTech firms that are not constrained by legacy systems are already moving toward blockchain-native infrastructure, and stablecoins are emerging as viable alternatives to traditional deposits. Incremental innovation can turn into structural competition faster than incumbents expect.

Clinging to outdated systems to preserve short-term fee income therefore carries its own risks. Sooner or later, customers will migrate toward providers offering faster, more transparent services. Settlement architecture will evolve. Ultimately, the dividing line will be between banks that lead the transition and those that are forced to follow on their heels.

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04.2026
ROLANDBERGER.COM

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