PART 9

The Treasury, Cash, and Banking

Technology Stack

Treasury is the most underinvested technology area in finance and the most exposed to the macroeconomic regime of the coming decade.

The Finance Technology Stack
A CFO's Strategic and Architectural Guide

Why Treasury Is the Underinvested Frontier

Treasury is the function in which liquidity, risk, and capital meet. The function holds responsibility for the cash that the enterprise generates and consumes, the debt and equity capital that funds the enterprise, the financial risks the enterprise carries in the form of foreign exchange exposure and interest rate exposure and commodity exposure where applicable, and the banking relationships through which the cash and capital flow. The function is structurally one of the more important areas of the finance function. The function is also, in most enterprises, the most underinvested area of the finance technology stack and the area most exposed to the macroeconomic regime of the coming decade.

The underinvestment is consistent across enterprise size. Small companies operate treasury through spreadsheets and email well past the scale at which the spreadsheet approach has become inadequate. Mid-market companies operate treasury through a combination of spreadsheets and bank web portals, with cash visibility lagging actual cash positions by days and with cash forecasting performed monthly when it is performed at all. Even larger companies frequently operate treasury through legacy systems that were implemented years ago, that have not been substantially evolved since, and that produce a treasury operation that is structurally weaker than the operational sophistication the function deserves. The underinvestment is so common that the dedicated treasury management system platforms have a much smaller installed base than the enterprise resource planning systems despite the comparable strategic importance of the function.

Several reasons account for the underinvestment. Treasury is owned by the treasurer rather than by the chief financial officer in most enterprises, and the treasurer's incentives are typically risk minimization rather than capability building. The capital investment in treasury technology produces returns that are real but difficult to attribute, because the returns appear as marginal improvements in cash positions, marginal improvements in foreign exchange hedge effectiveness, and reduced manual effort that is hard to quantify. The treasury function is small relative to other finance functions, with the consequence that the absolute dollar value of the function appears modest even when the strategic value is substantial. The interest rate environment of the 2010s and early 2020s, when rates were near zero, masked the working capital and liquidity management opportunities that have become visible again as rates have normalized. These dynamics produce a pattern in which treasury investment is repeatedly deferred in favor of investments in more visible areas of the finance technology stack.

The macroeconomic regime of the coming decade will not allow this pattern to continue. The era of near-zero interest rates that masked the cost of treasury inattention is over. Interest rate volatility has returned. Currency volatility has returned with the geopolitical reordering that has been underway since 2022. Liquidity has become more expensive and more important to manage.

The cost of capital has risen and the discipline of capital deployment has correspondingly risen in importance. The treasury function that operates with twentieth-century granularity in this twenty-first-century environment will produce decisions that the macroeconomic regime will punish. The chief financial officer who allows treasury to remain underinvested in this environment is accepting a degree of operational risk that prior macroeconomic conditions tolerated but that current and prospective conditions will not.

The work of this part is to lay out the treasury technology stack with the seriousness the function deserves. The part treats the category landscape, examines the bank connectivity revolution that is reshaping the field, surfaces the architectural decisions, and provides the diligence questions. The reader will leave with the framing to elevate treasury technology to the strategic priority the macroeconomic environment requires rather than continuing the deferral that has been the historical pattern.

The Components of the Treasury Technology Stack

The treasury technology stack consists of distinct functional components that combine to support the treasury function. The components must be understood individually and reasoned about together. The chief financial officer who treats the stack as a single category, looking only at the treasury management system, will miss the architectural reality that the modern treasury function operates as an integrated set of platforms rather than as a single system.

The Treasury Management System

The treasury management system is the platform at the center of the treasury function. The system holds the canonical record of bank accounts, cash positions, debt instruments, investment positions, foreign exchange exposures and hedges, and the financial counterparty relationships that the treasury function maintains. The system provides the operational workflow for cash management, payments, foreign exchange execution, debt and investment management, and the accounting interfaces that feed the general ledger.

The category leaders include Kyriba, which has grown to be the most widely adopted dedicated treasury management system in the mid-market and lower enterprise segments. GTreasury, which serves the upper mid-market and the enterprise segments with substantial functional depth. ION Treasury, formerly Wallstreet and OpenLink and now consolidated under the ION brand, which serves the largest enterprises with the deepest functional capability and the highest implementation cost. FIS Quantum, which serves a similar segment to GTreasury with strong functional capability. Bellin, now part of Coupa, which serves the mid-market with a focus on the European customer base.

Several newer platforms have entered the category in the past five years with modern cloud-native architectures. Trovata has built a position in the mid-market with a focus on bank data aggregation and cash visibility. Treasury4 serves the mid-market with a modern cloud-native platform. FinLync provides bank connectivity capabilities that compete with the bank connectivity components of the established treasury management systems. Atlar has built a position in payments and bank connectivity for European mid-market customers. The category continues to evolve with substantial investment from venture capital sources flowing into the newer entrants.

The architectural choice in this component is more nuanced than the simple question of which platform to choose. The choice involves the trade-off between the functional depth of the established platforms and the modern architecture of the newer entrants. It involves the trade-off between the comprehensive treasury management systems that handle all components of the

treasury function and the specialized platforms that focus on specific components like bank connectivity or cash forecasting. It involves the choice between dedicated treasury platforms and the treasury capabilities embedded in the broader enterprise resource planning systems.

Cash Forecasting

Cash forecasting is the discipline of projecting cash flows over short, medium, and long horizons to support the operational decisions of the treasury function and the strategic decisions of the broader finance function. The short-horizon forecast supports day-to-day liquidity management and bank funding decisions. The medium-horizon forecast supports working capital management and short-term debt management. The long-horizon forecast supports capital structure decisions and strategic capital allocation.

The discipline has been transformed substantially over the past decade. The traditional approach to cash forecasting was a labor-intensive process in which treasury analysts assembled forecasts from operational data, accounting projections, and judgment about the timing of specific large items. The modern approach uses platforms that automatically aggregate the relevant data, that apply statistical models to project recurring patterns, that integrate with the procure-to-pay and order-to-cash spines to capture committed flows, and that produce forecasts at granularity that the traditional approach could not support.

The leading platforms in cash forecasting include the cash forecasting modules of the major treasury management systems, dedicated cash forecasting platforms like the Cashforce platform now part of Kyriba and Trovata's cash forecasting capability, and increasingly the application of broader artificial intelligence platforms to the cash forecasting problem. The architectural choice in this component depends on the complexity of the cash forecasting requirements and the integration with the broader treasury management infrastructure.

Bank Connectivity

Bank connectivity is the infrastructure through which the treasury function communicates with its banking partners. The infrastructure handles the receipt of bank statements, the initiation of payments, the receipt of confirmations and notifications, and the broader information flow that connects the treasury operation to the banking system. The infrastructure has been the slowest-evolving component of the treasury technology stack and is currently in the middle of a transformation that will reshape the field.

The traditional bank connectivity infrastructure was built around the SWIFT network for cross-border communication and around bank-specific direct connections for domestic communication. The SWIFT network requires substantial investment to access and has

historically been used primarily by the largest enterprises. The bank-specific direct connections are operational but produce a connectivity architecture that varies bank by bank, that is expensive to maintain, and that does not scale to the modern enterprise that operates accounts across dozens of banks.

The transformation underway is the emergence of bank application programming interfaces that provide modern connectivity to bank services. The leading banks have invested substantially in API capabilities over the past five years, and the platforms that aggregate bank APIs have emerged to provide unified connectivity across multiple banks. FinLync provides bank API connectivity that integrates with the major enterprise resource planning systems. The treasury management systems have all extended their bank connectivity capabilities to incorporate API connections alongside the traditional connections. The transformation is incomplete. Bank API capabilities vary substantially across banks and across geographies. The chief financial officer who anticipates the transformation will design the treasury architecture with awareness of the API trajectory rather than committing to architectures that depend on the legacy connectivity patterns.

Payment Hubs

The payment hub is the platform that orchestrates the execution of payments across the multiple banking relationships and multiple payment methods the enterprise operates. The hub handles the routing of payments to the appropriate banking channel, the formatting of payment instructions for each bank's specific requirements, the receipt of confirmations and exception handling, the reconciliation of payment activity to the bank statements, and the audit trail of payment activity.

The payment hub function may be performed by the treasury management system, by a dedicated payment hub platform, or by the payment capabilities of the broader procure-to-pay or accounts payable platforms. The dedicated payment hub category includes Bottomline, which has been a long-standing leader in payment processing for treasury and accounts payable, and the payment hub capabilities embedded in the major treasury management systems. The category overlaps with the broader payments infrastructure of the enterprise, and the architectural choice involves the partition of payment responsibility between treasury and the rest of the finance function.

Foreign Exchange Management

Foreign exchange management is the discipline of identifying, measuring, and managing the foreign exchange exposure of the enterprise. The discipline involves the natural exposure that arises from foreign-denominated revenue and expense, the balance sheet exposure that arises from foreign-denominated assets and liabilities, the translation exposure that arises from

consolidating foreign subsidiaries, and the structural exposures that arise from foreign investments and intercompany financing arrangements. The discipline operates the hedging program that mitigates the exposures the enterprise chooses to hedge.

The platforms supporting foreign exchange management include the foreign exchange modules of the major treasury management systems, dedicated foreign exchange platforms like FXall and 360T that provide market access for execution, and the foreign exchange capabilities embedded in the broader payments infrastructure. The architectural choice involves the integration between the exposure identification, the hedge decision, the hedge execution, and the hedge accounting that produces the financial statement treatment. The chief financial officer of an enterprise with substantial foreign exchange exposure must hold this architectural decision deliberately.

In-House Banking

In-house banking is the architectural approach in which the parent entity operates as a bank for its subsidiaries, with intercompany financing, intercompany cash pooling, and intercompany foreign exchange handled through the parent rather than through external banking arrangements at each subsidiary. The approach captures substantial benefits in working capital optimization, foreign exchange management, and banking cost reduction for enterprises with multiple subsidiaries operating across multiple jurisdictions.

In-house banking is supported by the in-house banking modules of the major treasury management systems and by the specialized platforms that focus on intercompany treasury management. The architectural complexity of in-house banking is substantial, involving regulatory considerations in multiple jurisdictions, tax considerations that affect the structuring of intercompany flows, accounting considerations for the intercompany positions, and operational considerations for the management of the in-house bank as a function. The chief financial officer of an enterprise that operates across multiple jurisdictions should examine the in-house banking opportunity even if the conclusion is that the enterprise is not yet ready for the architectural commitment.

The Bank API Revolution

The most consequential development in the treasury technology field over the past five years is the emergence of bank application programming interfaces as a primary connectivity mechanism. The development is reshaping the field in ways that the chief financial officer must understand because the architectural choices made in the next several years will be either reinforced or constrained by the trajectory of the API revolution.

What Has Changed

The traditional bank connectivity was built on three primary mechanisms. The SWIFT network handled cross-border payments and a portion of statement and information flow. Direct bank connections, established bank by bank, handled the operational flow for domestic banking relationships. Bank web portals handled the human-driven access to bank services that was not automated through SWIFT or direct connections. The architecture was operational. It was also expensive to maintain, fragmented across banks, and limited in the granularity and frequency of information flow.

The bank API revolution has changed each of these mechanisms. The leading banks have built APIs that provide programmatic access to account information, payment initiation, statement retrieval, and a growing set of additional services. The platforms that aggregate bank APIs have emerged to provide unified connectivity across multiple banks. The granularity and frequency of information flow has improved substantially, with intraday statement information available where overnight statements were the previous standard. The cost of connectivity has decreased as the API mechanisms displace the direct connections and reduce the dependence on SWIFT for domestic flows.

The change has not been uniform. Bank API capabilities vary substantially across banks. The largest global banks have invested most aggressively in API capabilities. Regional banks and banks in less developed markets have invested less. The variability means that an enterprise operating accounts across multiple banks will have different API capabilities available at different banks, and the architectural decisions must accommodate the variability.

What This Means for Architecture

The architectural implications of the API revolution are several. The treasury management systems must integrate with the bank APIs, and the integration capabilities have become a more important selection criterion than they were five years ago. The aggregation platforms like FinLync that consolidate bank API connectivity have become important architectural components

that did not exist in the previous architecture. The cash visibility capability of the treasury function has improved substantially because the information flow is more frequent and more granular. The cash forecasting accuracy has improved because the forecast can be based on more current information. The bank relationship management has changed because the operational dependence on any single bank is reduced when the connectivity is API-based.

The architectural implications also include risk considerations. The API-based connectivity introduces new dependencies and new security considerations. The aggregation platforms become single points of failure that require attention. The API authentication and authorization mechanisms must be operated carefully. The chief financial officer who pursues the API-based architecture must accept these considerations and address them deliberately.

The Trajectory Forward

The trajectory of the API revolution is toward broader adoption, deeper capability, and increasing standardization. The Common Domain Model and other industry standardization efforts are progressing. The major banks are continuing to extend their API capabilities. The aggregation platforms are continuing to expand their bank coverage. The chief financial officer planning a treasury technology architecture in 2026 should design for the API-centric future even if the current state includes substantial dependence on legacy connectivity. The architectural decisions that constrain the API trajectory should be made with awareness of what they are constraining. The architectural decisions that embrace the API trajectory should be made with awareness of the gaps that remain to be filled.

The Architectural Decisions

Several architectural decisions span the treasury technology stack and must be held deliberately.

The Centralized Versus Decentralized Treasury Decision

The first architectural decision is the choice between a centralized treasury function and a decentralized one. A centralized treasury function operates the cash management, payments, foreign exchange management, and capital management for the entire enterprise from a single central function with a single technology platform. A decentralized treasury function distributes these activities across regional or business unit treasuries with local technology platforms supplemented by some central coordination.

The dominant trend over the past two decades has been toward centralization, supported by the capabilities of modern treasury management systems and the cost discipline that centralization permits. The benefits of centralization include the consolidated cash visibility across the enterprise, the operational efficiency of centralized expertise, the leverage in banking relationships, the consistency of risk management, and the capacity for in-house banking that decentralization cannot easily support. The costs include the loss of local responsiveness, the risk concentration in a single function, and the political complexity of consolidating activities that may currently be performed locally.

The right answer depends on the structure of the enterprise. A multinational enterprise with operations in multiple regulatory regimes may need some treasury capability at the local level to handle the specific regulatory requirements of each jurisdiction. A decentralized federation of acquired entities may require time to evolve toward centralization. The chief financial officer who holds this decision deliberately will design a treasury architecture that fits the enterprise. The chief financial officer who follows the centralization trend without examining the specific case may produce a centralized architecture that imposes costs the enterprise has not accepted.

The Multi-Bank Relationship Strategy

The second architectural decision is the strategy for the banking relationship portfolio. Some enterprises operate with a single global bank that handles substantially all banking relationships. Other enterprises operate with a small group of relationship banks that handle the strategic banking needs and a broader portfolio of operational banks that handle specific transactional needs. Other enterprises operate with a substantial number of banks distributed across regions, products, and capabilities.

The strategy is shaped by several factors. The geographic footprint of the enterprise determines the geographic coverage required from the banking partners. The product needs of the enterprise determine the specific banking capabilities required. The risk management considerations determine the desirable diversification across counterparties. The pricing leverage considerations determine the trade-off between deeper relationships with fewer banks and broader portfolios with more banks. The technology architecture choices determine the practical capacity to operate across the bank portfolio efficiently.

The chief financial officer who holds this decision deliberately will design a banking relationship portfolio that fits the enterprise. The banking relationship strategy and the treasury technology architecture must be designed together rather than separately, because the technology capabilities determine what banking relationship strategies are practical and the banking relationship strategy determines what technology capabilities are required.

The Treasury Cycle Time Posture

The third architectural decision is the posture on treasury cycle time. The traditional treasury cycle operates on an overnight rhythm. The bank statements arrive overnight. The cash position is reconciled the next morning. The cash forecast is updated daily. The payment decisions are made for execution on the same or next business day. The treasury cycle has gradually compressed over time, and the modern technology supports a treasury cycle that operates substantially closer to real time.

The intraday treasury posture, in which the cash position is visible intraday rather than overnight, in which payments can be executed in real time through the emerging real-time payment rails, and in which the treasury decisions can be made on current information rather than overnight information, is increasingly achievable. The achievement requires investment in the technology architecture and the operational discipline to operate at the faster cycle. The benefits include better cash positioning, faster response to liquidity needs, and the capacity to capture opportunities that the overnight cycle cannot reach. The costs include the technology investment and the operational discipline required to maintain the faster cycle.

The chief financial officer who holds this decision deliberately will choose a treasury cycle posture that matches the operational requirements of the enterprise. A high-velocity enterprise with substantial intraday cash flow variability will benefit from the investment in intraday treasury. A stable enterprise with predictable cash flows may not require the investment. The choice should be made on the merits of the specific case rather than by default to the traditional cycle or by aspiration to the most modern capability.

The Diligence Questions

The diligence questions for the treasury technology decisions address the architecture as a whole and the specific platform decisions within it.

Questions to Ask of Platform Vendors

How does your platform handle the specific complexity of our treasury operation: our bank portfolio, our geographic footprint, our foreign exchange exposure profile, our payment volume, and our regulatory requirements? How does your platform integrate with our specific banks, and what is the level of automation versus manual intervention required for each bank relationship? What is your bank application programming interface coverage today, and what is your roadmap for expanding it? How does your platform handle the cash forecasting requirements of our business, and what is the typical forecast accuracy your customers achieve at different horizons? How does your platform support the foreign exchange management we conduct, including the exposure identification, the hedge decision support, the execution integration, and the hedge accounting? What is your customer concentration in our segment, and how does that concentration shape your roadmap? What is your typical implementation duration and cost for a company of our size and complexity? How does your platform evolve as our treasury function evolves, and what is the cost of significant changes after the initial implementation?

Questions to Ask of Reference Customers

How does the platform integrate with your specific banks, and what is the ongoing maintenance burden of the bank connectivity? What was your implementation experience, and what would you do differently in retrospect? What is your cash visibility today compared to before the platform, and what is your cash forecasting accuracy? How is the platform handling your foreign exchange management, and what improvements have you achieved in hedge effectiveness or hedge accounting? How is the platform supporting your relationship with the external auditor, particularly on the controls over treasury operations? How is the platform evolving, and how is the vendor responding to your specific requests for capability extensions? What is your day-two operating model, and how is the platform owned and operated within your treasury function? How would you evaluate the platform now, with the benefit of operational experience, against the platforms you did not select?

Questions to Ask of One's Own Team

What is the current state of our treasury function, and where specifically are the gaps in capability that the platform investment must address? What is our bank portfolio, and what is our current state on bank connectivity, cash visibility, and payment execution? What is our foreign exchange exposure, and what is our current state on exposure identification, hedge decision support, and hedge accounting? What is our cash forecasting practice today, and what is the gap between our current practice and the practice that modern platforms enable? What is our integration architecture between treasury and the rest of the finance function, particularly accounts receivable, accounts payable, and the general ledger? What is our team capacity to operate a modern treasury platform, and where do we have gaps in expertise or capacity? What is our governance structure for the treasury function, and is it adequate for a more sophisticated operational model?

Operating Implications

The treasury function is operated continuously, with the technology platform supporting daily operations across the years. The operating implications follow from this continuous operational reality.

The Daily Operating Cadence

A well-architected treasury function operates on a defined daily cadence. The morning begins with the reconciliation of the prior day's activity and the establishment of the current cash position across the bank portfolio. The cash forecast is updated with the actual activity and with any new information about expected flows. The funding decisions for the day are made, including any short-term investment or short-term borrowing decisions. The payment instructions for the day are reviewed and approved. The foreign exchange exposures are reviewed and any required execution is initiated. The afternoon includes the monitoring of the day's activity, the management of any exceptions, and the preparation for the next day. The end of day includes the reconciliation of bank balances and the preparation of the overnight processing.

The cadence is supported by the treasury technology platform but is operated by the treasury team. The platform makes the cadence achievable at granularity and consistency that manual operation cannot support. The team brings the judgment and the decision-making that the platform cannot provide. The chief financial officer who designs the cadence deliberately and the team that operates it will produce a treasury function that operates at the level of sophistication the modern environment requires.

The Risk Management Discipline

The treasury function holds responsibility for substantial financial risks. The foreign exchange risk, the interest rate risk, the counterparty credit risk in the banking relationships, the liquidity risk that the cash forecast addresses, and the operational risk of the payment execution all sit within the treasury function. The risk management discipline includes the policies that govern each risk, the limits that constrain the exposures, the metrics that measure the exposures and the limit utilization, the reporting that surfaces the risk profile to the chief financial officer and the audit committee, and the operational controls that ensure the policies are enforced.

The treasury technology platform supports the risk management discipline by providing the data on which the risk measurement depends, by enforcing limits architecturally rather than by policy, and by producing the reporting that the discipline requires. The chief financial officer who treats risk management as a treasury responsibility supported by the technology will produce a

discipline that holds up under scrutiny. The chief financial officer who treats risk management as a topic addressed through ad hoc analysis when issues arise will produce a discipline that fails when the issues materialize.

The Banking Relationship Management

The banking relationships are strategic assets of the enterprise. The relationships provide the operational capabilities the enterprise depends on, the credit capacity that supports the capital structure, the foreign exchange execution that supports the international operations, the cash management capabilities that support the operational cycle, and the strategic advice that the relationship banks provide. The relationships require active management.

The active management includes the periodic review of the share of wallet across the relationship banks, the rationalization of operational accounts that have accumulated over years, the negotiation of pricing on the banking services, the review of the credit terms in the credit facilities, the engagement with the relationship bankers on the strategic agenda of the enterprise, and the periodic reassessment of the relationship portfolio against the strategic needs of the enterprise. The treasury technology platform supports this management by providing the data on banking activity and pricing that informs the negotiation. The chief financial officer who treats banking relationships as worth managing actively will produce a banking portfolio that supports the enterprise. The chief financial officer who treats banking relationships as utility relationships that operate in the background will produce a portfolio that consumes more than it should and delivers less than it could.

Synthesis

Treasury is the function in which liquidity, risk, and capital meet. It is also the most underinvested area of the finance technology stack and the area most exposed to the macroeconomic regime of the coming decade. The era of near-zero interest rates that masked the cost of treasury inattention is over. Interest rate volatility, currency volatility, and liquidity considerations have returned to first-order importance. The chief financial officer who allows treasury to remain underinvested in this environment is accepting operational risk that the current environment will not tolerate.

The treasury technology stack consists of distinct components that combine to support the function. The treasury management system at the center, with Kyriba, GTreasury, ION Treasury, FIS Quantum, and Bellin as the established platforms, and Trovata, Treasury4, FinLync, and Atlar as the newer entrants. The cash forecasting discipline supported by the forecasting modules of the major platforms and the dedicated forecasting capabilities. The bank connectivity infrastructure in the middle of a transformation from SWIFT and direct connections to the emerging bank application programming interfaces. The payment hub function that orchestrates payment execution. The foreign exchange management discipline supported by treasury platforms and dedicated execution venues. The in-house banking architecture for enterprises operating across multiple jurisdictions.

The bank application programming interface revolution is reshaping the field. The leading banks have invested substantially in API capabilities. The aggregation platforms have emerged to provide unified connectivity. The granularity and frequency of information flow has improved substantially. The chief financial officer planning a treasury technology architecture in 2026 should design for the API-centric future, with awareness that the transformation is incomplete and the bank API capabilities vary substantially across banks and geographies.

Three architectural decisions span the stack. The centralized versus decentralized treasury decision determines the operational model of the function. The multi-bank relationship strategy determines the structure of the banking portfolio. The treasury cycle time posture determines whether the function operates on the traditional overnight cadence or on an intraday cycle that captures opportunities the overnight cycle cannot reach.

The operating implications include the daily operating cadence that a well-architected treasury function maintains, the risk management discipline that the function holds responsibility for, and the active banking relationship management that treats the banking relationships as strategic assets worth managing rather than as utility services that operate in the background.

The next part treats the tax technology stack, the layer that ensures the enterprise's tax obligations are calculated, paid, and reported correctly across an increasingly complex global regulatory environment. The treasury and tax functions intersect in several ways, but the architectural

reasoning for each is distinct. The architectural reasoning developed in this part carries forward into the treatment of the tax function in its own terms.