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Optimising Bank Performance: A Quantitative Framework with Significant Risk Transfer

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Overview

This article describes a quantitative framework for optimising bank balance sheet performance by integrating Significant Risk Transfer (SRT) transactions with dynamic, forward-looking asset allocation models. The research demonstrates that a constrained optimisation program that maximises profit under baseline economic forecasts while adhering to regulatory capital and liquidity constraints can substantially improve bank performance. Backtesting this model against the historical performance of major U.S. banks reveals significant gains, with an average improvement of 0.17 percentage points in Return on Assets and 1.98 percentage points in Return on Equity. Within the framework, SRTs function as a strategic tool, deployed not to directly generate profit but to alleviate binding capital and Return on Risk-Weighted Assets constraints, thereby unlocking more efficient and profitable asset allocations. The research also provides a disciplined approach to managing the inherent risks of SRTs, such as the cliff effect, by quantitatively modelling how the risk weights of retained tranches would deteriorate under stress, thus allowing for more robust, risk-aware strategic decisions. Ultimately, the findings present a practical, data-driven blueprint for banks to enhance risk-adjusted returns and achieve a competitive advantage through sophisticated, proactive balance sheet management.

The Banker's Dilemma: Navigating Profitability and Prudential Regulation

The fundamental challenge for modern banking institutions is the inherent tension between maximising profitability and adhering to a stringent and complex web of prudential regulations. In the post-crisis era, the Basel III framework has established rigorous international standards for capital adequacy, leverage, and liquidity. These rules restrict how banks can allocate assets, transforming balance sheet management from a straightforward profit-maximisation exercise into a complex, constrained optimisation problem. Banks must continuously adapt not only to evolving macroeconomic conditions but also to shifting regulatory

expectations, making this a persistent practical challenge.

In response to this environment, banks have increasingly turned to sophisticated capital management tools. Among the most powerful of these is the **Significant Risk Transfer (SRT)** transaction. An SRT is a financial instrument, typically structured as a synthetic securitisation, that allows a bank to transfer the credit risk associated with a portfolio of its loans to third-party investors without removing the assets from its balance sheet. This is commonly achieved through instruments like credit-linked notes (CLNs) or financial guarantees, where investors agree to absorb losses on a specified tranche of the loan portfolio in exchange for a premium (Accuria 2024).

The primary motivation for engaging in SRTs is regulatory capital optimisation. By transferring a significant portion of the credit risk, banks can reduce their Risk-Weighted Assets (RWA). This reduction directly improves key regulatory capital ratios, most notably the Common Equity Tier 1 (CET1) ratio. The capital that is freed up can then be redeployed to support new lending activities, invested in other strategic initiatives, or returned to shareholders, often serving as a more efficient alternative to raising new, potentially dilutive, equity. The strategic importance of this tool is underscored by the rapid expansion of the SRT market, which now references over $1 trillion in underlying loans globally (Accuria 2025).

The growing adoption of SRTs reflects a broader strategic shift. With the implementation of the final Basel III standards (often referred to as Basel IV), which are expected to further inflate RWAs, the ability to execute SRTs efficiently is evolving from a niche capital management technique into a core component of strategic balance sheet management and a key competitive differentiator among banking institutions. However, this strategy is not without complexity. While SRTs effectively transfer credit risk out of the highly regulated banking sector, they also create new, intricate interconnections by concentrating this risk within the less-regulated non-bank financial sector, including private credit funds, hedge funds, and insurance companies. This division introduces a central theme for strategic management: optimisation is not merely about maximising returns but also about deeply understanding and managing both the transferred and the retained risks (Accuria 2025).

A Dynamic, Forward-Looking Approach to Asset Allocation

To navigate this complex landscape, a robust, data-driven framework is required. The research provides such a blueprint, detailing a dynamic, forward-looking optimisation program designed to guide bank asset allocation decisions. The framework moves beyond single-period models by adopting a rolling three-year planning horizon, allowing it to capture more long-term strategies (Meszaros 2025)[1].

At the core of the framework is a sophisticated forecasting methodology. The model's inputs including loan yields, net charge-off rates, and funding costs are not based on simple historical averages. Instead, they are

[1] Accuria regularly offers internship projects to masters and PhD students for applied finance and data science research.

projected using a suite of econometric models, based on the work of Hirtle et al. (2016), which are driven by macroeconomic variables. This makes the **model's decisions sensitive to the anticipated economic environment**. The macroeconomic forecasts are sourced directly from supervisory stress tests. For U.S. banks we used the Federal Reserve's annual Dodd-Frank Act Stress Test (DFAST) scenarios. The framework employs a dual-scenario approach that embodies a philosophy of proactive risk management.

- The DFAST **Baseline Scenario**, representing the most likely economic outlook, is used to generate the inputs for the model's objective function, which is to maximise the bank's accounting profit.
- The **Severely Adverse Scenario**, which simulates a deep recession, is used to calibrate the risk parameters within the model's regulatory constraints. This innovative structure ensures that the optimisation process seeks the most profitable asset allocation under expected conditions, while guaranteeing that the resulting balance sheet remains resilient and compliant even in a severe economic downturn.

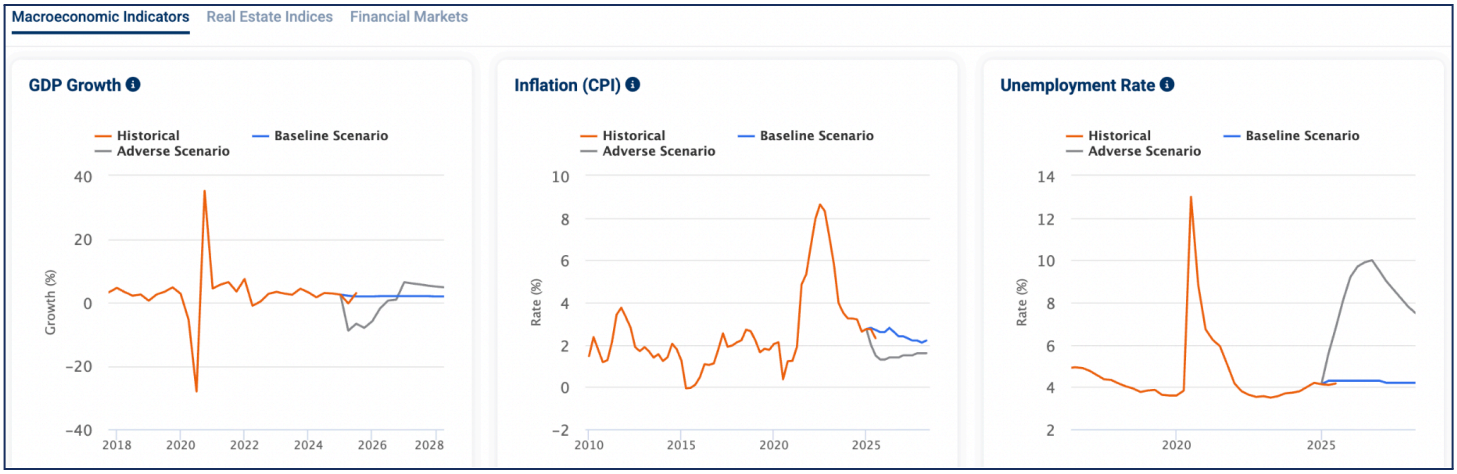

Figure 2: DFAST 2025 supervisory stress test scenarios. Source: Federal Reserve and Accuria DataHub

The Architecture of Constraints

The realism and power of the optimisation framework lie in its detailed modelling of the constraints that banks face in the real world.

Capital (CET1) Constraint

The model's capital constraint goes beyond enforcing a simple minimum CET1 ratio. It is defined by the following formulation:

$$\gamma \times RWA(x, h, SRT_h) \leq C - \sqrt{V(x, h)}$$

Here, *γ* is the minimum CET1 ratio, *RWA* is the total risk-weighted assets, and *C* is the bank's available CET1 capital. The innovative component is the risk function, V(x,h) , defined as:

$$V(x, h) = \sum_{i=1}^{n} (\sigma_i x_i - \min(\sigma_i, A_i) \cdot SRT_{h,i})^2$$

This function captures the impact of unexpected credit losses. It forces the bank to hold a capital buffer above the regulatory minimum, with the size of the buffer determined by the historical volatility of charge-offs σ_i for each asset class x_i. This structure correctly penalises asset classes with higher historical volatility, such as credit cards, by requiring a larger capital buffer against them, reflecting the precautionary motive of real-world bank capital management. The function also recognises that SRT transactions can mitigate this risk, reducing the required buffer up to the size of the junior tranche A_i for the portion of assets covered.

Liquidity and Funding Constraints

The framework also incorporates constraints for the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). These Basel III requirements ensure that the bank maintains sufficient high-quality liquid assets to cover net cash outflows in a 30-day stress scenario (LCR) and maintains a stable funding profile over a one-year horizon (NSFR). By including these constraints, the model ensures that the optimised portfolio is not only profitable and well-capitalised but also structurally sound from a funding and liquidity perspective.

Return on Risk-Weighted Assets (RoRWA) Constraint

A key element of the model is the inclusion of a Return on Risk-Weighted Assets (RoRWA) constraint. This is not a regulatory requirement but an internal performance target set within the framework. It is defined as:

$$\frac{\text{Net Income}}{\text{RWA}} \geq \text{Baseline RoRWA}_h + \Delta_h$$

This constraint mandates that the optimised portfolio must achieve a *RoRWA* that exceeds a baseline level by a specified margin Δ_h. Its function is to force the optimiser to pursue allocations that are efficient from a regulatory capital standpoint, explicitly tying the pursuit of profit to the prudent use of the bank's risk

capacity. Without this constraint, a pure profit-maximising model might favor high-yield, high-RWA assets, leading to an inefficient balance sheet from a regulatory perspective.

The Role of SRT as a Strategic Enabler

Within this constrained optimisation framework, SRTs play a unique role. The model treats SRTs not as a direct source of profit, but as a strategic enabler. In the objective function, SRTs appear as a cost, reflecting the premium payments made to investors for credit protection. The model is therefore only incentivised to utilise an SRT when one or more constraints, primarily the CET1 and RoRWA constraints, are binding and prevent the bank from moving to a more profitable asset allocation.

By executing an SRT, the bank reduces its RWA. This action directly relaxes the RWA-dependent CET1 and RoRWA constraints, thereby expanding the set of feasible allocations available to the optimiser. The SRT transaction becomes economically viable within the model only if the additional profit generated by the newly unlocked, more efficient asset allocation exceeds the cost of the SRT premium. In this way, the framework accurately models the true strategic value of SRTs: they are a key that can unlock a more profitable and efficient overall balance sheet structure.

Unlocking Superior Performance: The Quantified Impact of Optimisation

The empirical backtesting of the optimisation framework against the historical performance of three large U.S. commercial banks from 2015 to 2024 reveals a compelling case for this data-driven approach. The optimised allocations consistently deliver **substantial improvements across a range of key performance indicators**, demonstrating the tangible value that can be unlocked through a more quantitative and forward-looking strategy.

The headline results, summarised in Table 1, are striking. When driven by the Fed's baseline economic forecasts, the optimised portfolios improved the average Return on Assets (RoA) by 17 basis points and the average Return on Risk-Weighted Assets (RoRWA) by 22 basis points compared to the banks' actual historical allocations. The impact on shareholder and capital-focused metrics was even more pronounced, with Return on Equity (RoE) increasing by 1.98 percentage points and Return on CET1 Capital (RoCET1) rising by 3.76 percentage points.

These results indicate that t**he framework itself, even when operating with imperfect forecasts, is the primary driver of value**. A simulation run under the hypothetical assumption of perfect foresight showed only a modest additional gain over the baseline scenario, suggesting that the model's structural logic and constraint-aware optimisation are responsible for capturing the majority of the potential performance improvement.

Performance Metric	Historical Average	Optimised (Baseline)	Improvement
Return on Assets (RoA)	0.98%	1.15%	+0.17%
Return on Equity (RoE)	9.87%	11.9%	+1.98%
Return on RWA (RoRWA)	1.61%	1.83%	+0.22%
Return on CET1 (RoCET1)	11.9%	15.7%	+3.76%

Table 1: Key performance indicator improvements for major U.S. banks under the proposed optimisation framework. Source: Meszaros 2025

The source of these gains is not just a strategy of maximising exposure to the highest-yielding assets. Instead, the analysis of the optimised portfolios reveals a dynamic and adaptive allocation process. While the model often increases allocations to profitable segments like credit cards and stable ones like residential mortgages, the degree of reallocation varies significantly over time and across institutions, reflecting the model's sensitivity to changing market conditions and forecasts. This intelligent, responsive behavior stands in stark contrast to static, heuristic-based allocation strategies. Figure 1 shows the hypothetical optimal allocation of the largest U.S. banks under this optimisation framework. The dynamic heterogeneity is striking, demonstrating that optimal strategies for different institutions vary significantly.

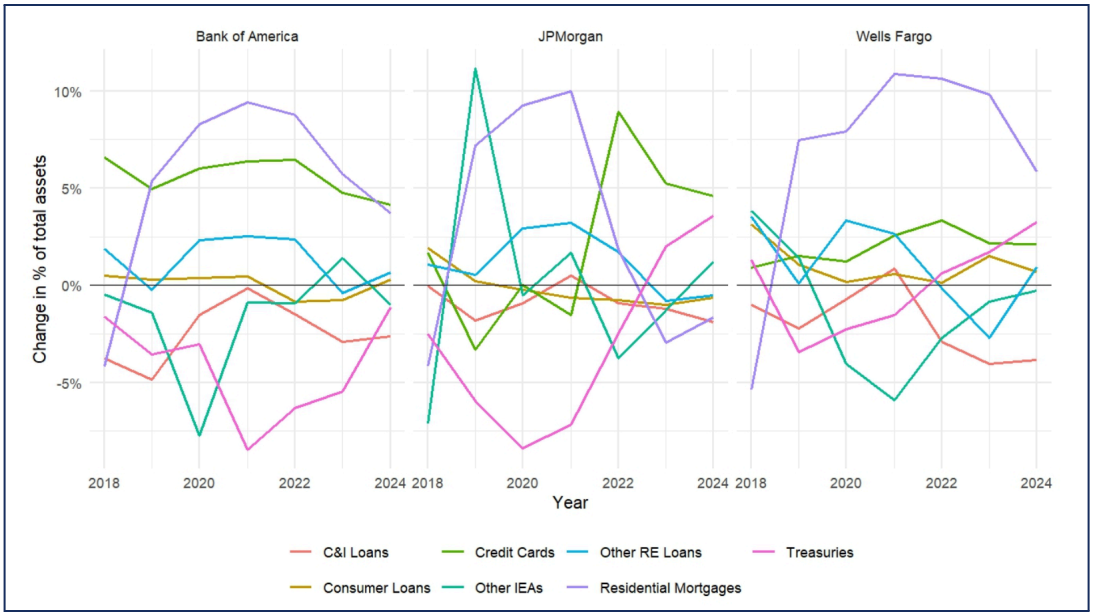

Figure 1: Rolling year 3 optimised allocation compared with historical allocations for major U.S. banks. Source: Meszaros 2025

The substantial and consistent model outperformance across three different major banks strongly suggests that their historical, human-driven asset allocation strategies were, at least in the context of this framework, suboptimal. While the model operates in a simulated, frictionless environment, the

sheer magnitude of the performance gains indicates that a more quantitative, forward-looking, and constraint-aware approach to strategic planning can unlock significant value that may currently be unrealised.

SRT as a Catalyst for Performance

The framework's use of SRTs is a direct and logical consequence of its binding constraints. The model deploys SRTs most frequently for the banks in the study that historically operated with lower capital ratios, such as Bank of America and Wells Fargo. This empirically validates the role of SRTs as a targeted tool for capital optimisation, used precisely when and where they are needed most to alleviate capital pressure.

The primary incentive for SRT usage within the model is the strategic RoRWA constraint. To meet its RoRWA improvement targets, the optimiser seeks out opportunities to enhance RWA efficiency. SRTs provide a direct path to this goal. The model's preferred assets for SRT transactions are those with high regulatory risk-weights (typically 100%) but strong underlying credit quality, indicated by low historical and forecasted charge-off rates. This leads to a focus on segments like commercial and industrial (C&I) loans and commercial real estate (CRE) loans, where significant RWA reduction can be achieved at a relatively low premium cost.

A deeper analysis reveals a dual purpose for SRTs within the framework. When the model is run without the RoRWA constraint, SRT usage declines significantly but does not vanish. In this alternate scenario, the primary driver for SRTs shifts. The incentive is no longer RWA efficiency but the desire to minimise the V(x,h) risk function in the CET1 capital constraint. This function is driven by the *volatility* of charge-offs. Consequently, the model begins to apply SRTs to high-volatility asset classes like credit cards, not to improve RoRWA, but to reduce the required capital buffer against unexpected losses and mitigate concentration risk. This finding demonstrates that SRTs can be deployed in two distinct strategic modes: tactically, to achieve RWA efficiency and meet risk-adjusted return targets, or strategically, to hedge the volatility of the capital base and manage concentration risk in high-variance portfolios.

A Disciplined Approach to Risk: SRT Performance in Stressed Conditions

While SRTs offer compelling benefits for capital optimisation, they are not without risk. A primary concern for regulators and market participants is the potential for these instruments to create hidden vulnerabilities. By transferring credit risk from the highly regulated banking system to the less-regulated non-bank financial sector, SRTs create new forms of interconnectedness that could pose systemic risks in a crisis.

A key manifestation of this risk is the **cliff effect**. In a severe economic downturn, the credit quality of the underlying loan portfolio in an SRT can deteriorate rapidly. According to the regulatory formulas used to calculate RWA, this deterioration can cause a sharp, nonlinear increase in the risk weight of the senior

tranche retained by the bank. This sudden spike in RWA erodes or even eliminates the capital relief generated by the SRT precisely at the moment the bank is under the most financial stress and capital is most scarce. The European Systemic Risk Board (ESRB) has explicitly highlighted this pro-cyclical behavior as a significant concern (Accuria 2025, ESRB 2023).

Our framework makes a significant contribution by moving this concern from a qualitative debate to a quantifiable analysis. The model does not ignore the cliff effect; it actively measures it. By running the optimised SRT structures through the Fed's Severely Adverse Scenario, the research quantifies how the risk weights of retained tranches would evolve under stress. The results from this analysis are revealing:

- For high-volatility assets like **credit cards**, which experience a dramatic spike in projected charge-offs during a recession, the risk weight of the retained senior tranche can approach 150%. This effectively negates the initial capital benefit and could even lead to a higher capital requirement than before the transaction.
- For assets with stronger credit quality, such as **commercial and industrial loans**, the risk weight increase is more moderate but still significant, leading to a material reduction in the RWA savings.
- For asset classes like **commercial real estate**, which exhibited lower charge-off rates even in a downturn, the impact on the retained tranche's risk weight is minimal.

This analysis is made possible by the model's technical design. In the U.S., the risk weight of a securitisation tranche is calculated using the Simplified Supervisory Formula Approach (SSFA), a regulatory formula that is sensitive to the expected losses in the underlying portfolio (represented by the parameter W). By forecasting charge-off rates under the Severely Adverse Scenario and feeding these stressed forecasts into the SSFA formula, the framework can project the future risk weight of the retained tranche in a downturn.

This transforms a qualitative risk into a quantitative input for strategic decision-making. The optimisation process, from its inception, is aware that an SRT on a high loss volatility portfolio carries a higher cliff risk than a more stable portfolio. This risk is implicitly priced into the initial optimisation decision, leading to a more robust and resilient balance sheet structure. It demonstrates that the key to managing the risks of SRTs is not to avoid the transactions altogether, but to structure the entire balance sheet with a disciplined, forward-looking view of potential downturns. The framework's dual-scenario approach, optimising for baseline returns while being constrained by severely adverse outcomes, is the embodiment of this proactive risk management philosophy, providing a direct and quantitative answer to the concerns raised by regulatory bodies.

Conclusion: A Blueprint for Data-Driven Balance Sheet Strategy

Our findings offer more than just an academic validation of an optimisation model; they provide a practical blueprint for the future of strategic bank balance sheet management. The research demonstrates conclusively that an integrated, quantitative approach combining dynamic optimisation, forward-looking

stress testing, and sophisticated capital management tools like SRTs can deliver superior, risk-adjusted returns.

The framework's ability to generate substantial and consistent outperformance across multiple major financial institutions points to the significant value that can be unlocked by moving beyond traditional, heuristic-based strategic planning. The model's nuanced and adaptive use of SRTs—deploying them not as a primary profit driver but as a strategic enabler to relieve binding capital and risk-adjusted return constraints—highlights their true value in a modern banking context. Furthermore, the framework's sophisticated and quantitative approach to managing the inherent cliff effect risk demonstrates that these instruments can be used responsibly and prudently.

This strategic clarity provides a powerful answer to the significant operational challenges that characterise the SRT market (Accuria 2025). Executing these transactions involves navigating considerable hurdles in data management, obtaining regulatory approval, and fulfilling ongoing reporting obligations. A robust, automated optimisation framework provides the rigorous, data-driven analysis required to overcome these challenges. For example, the model's outputs can serve as direct quantitative evidence to support the **commensurate risk transfer** analysis demanded by supervisors, streamlining the approval process.

In an environment of increasing regulatory pressure, heightened market volatility, and intense competition, the ability to dynamically optimise a bank's balance sheet based on forward-looking, stress-tested data represents a formidable competitive advantage. The framework detailed herein provides an empirically validated and theoretically sound blueprint for building this capability. It marks a path away from reactive compliance and toward proactive, data-driven strategic management, setting a new standard for achieving sustainable profitability and resilience in the banking industry.

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About Accuria

Accuria is a cutting-edge credit portfolio management platform that helps clients trade and monitor loan portfolios using a series of domain expert AI agents to automate the processing of data, documents and transactions. Accuria offers automated due diligence, data migration, valuation and reporting services for performing and non performing assets across 28 jurisdictions.

With the help of its proprietary data mapping and transformation tool Accuria helps financial institutions to map their data to a variety of data formats such as those defined by EBA for NPL transactions, EBA for the valuation in resolution, and by ESMA for securitisation disclosures. Once standardised and validated, the loan-level data can be uploaded to the Accuria valuation tool to conduct a detailed discounted cash flow analysis using pre-populated pricing parameters in different macroeconomic scenarios across all major asset classes.

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