

## A Cost-effective Solution to New FRTB Computing Requirements

New regulatory requirements are driving pervasive changes throughout virtually all banking institutions as Fundamental Review of the Trading Book (FRTB) regulations take effect. Any firm with a trading book is affected by rules impacting virtually every aspect of trading book risk management and the computing power needed to support it. This whitepaper provides a brief overview of the new requirements and how TIBCO and AWS can help. FRTB introduces three key amendments to market risk capital framework:

### 1. TRADING BOOK VS. BANKING BOOK

FRTB mandates new rules to determine the scope of instruments eligible for inclusion in the trading book as well as more stringent requirements to govern internal risk transfers between banking and trading books. This is the “revised boundary,” where FRTB guidelines will focus on reducing arbitrage rather than asking for quantitative justification of including a book in the trading book.

### 2. CHANGES TO THE STANDARD METHOD FOR MARKET RISK

FRTB revises the standard approach to market risk, intending to be more risk-sensitive by reducing the difference in capital requirements between the internal model and the previous approach.

A liquidity horizon is defined as “the time required to execute transactions that extinguish an exposure to a risk factor, without moving the price of the hedging instruments, in stressed market conditions.” Under Basel 2.5, a “liquidity horizon” was introduced, which formed the input to the Incremental Risk Charge (IRC) and the Comprehensive Risk Measure (CRM).

Under FRTB (so called Basel IV), banks' risk factors will be assigned five liquidity horizon categories, ranging from 10 days to one year to ensure consistency in capital outcomes and to balance the trade off between simplicity and risk sensitivity.

### 3. CHANGES TO THE INTERNAL MODEL APPROACH FOR MARKET RISK

- A substitution of value at risk and stressed value at risk with a single expected shortfall risk measure.
- Introduction of liquidity horizons in the expected shortfall calculation to reflect the period of time to liquidate a position during a period of stress.
- Less recognition of cross-asset class diversification in the final capital calculation.
- The replacement of incremental risk charge (IRC) with default risk charge (DRC), which is intended to capture default risk within the market risk framework.
- Risk factors that cannot be modeled.
- Back-testing requirements for internal models for the trading desk. Failure to meet these requirements will force a trading desk to use the standardized approach for market risk.

### RELATIONSHIP BETWEEN INTERNAL MODELS AND STANDARDIZED APPROACHES

There is a very large difference in capital calculation when using internal models vs. standardized approaches. The Bank for International Settlements (BIS) is trying to bridge this gap and will bring the models-based calculation closer to the standardized approach calculations:

- Establish the link between capital calculated by the two approaches
- Require mandatory calculation of capital using standardized approach by the banks
- Make standardized capital the base for the capital requirements and introduce a surcharge on the models-based approach

Overall, these changes include:

- More granular and prescriptive standards designed to limit implementation interpretations and promote consistency across jurisdictions
- A revised trading book/banking book boundary with more explicit requirements for inclusions and exclusions of positions and limitations on reclassifications to reduce the scope for arbitrage
- An overhaul of the Internal Models Approach (IMA) to focus on tail risk, varying liquidity horizons, constrained diversification, and risk factor observability standards
- Stringent trading desk-level IMA approval processes, including new profit and loss (P&L) attribution tests to assess the impact of the differences in risk factors used in risk management and bank pricing models
- An overhaul of the Standardized Approach to make it more risk sensitive and explicitly capture default and other residual risks, and serve as a base for IMA charges

These changes are estimated by the committee, resulting in an estimated 40 percent weighted average increase in total market risk capital requirements from current levels. Individual bank results will vary depending on the composition of a bank's trading portfolios.

#### IMPACT OF THE FRTB

Compared to today, the best to worst case scenario for changes due to the new regulation could be five to 20 additional computing runs. If you run 20,000 servers today, you may need 120,000. Most banks estimate needing to increase compute grids by three to eight times to meet FRTB SLAs.

The changes that must be made to a bank's infrastructure to implement the FRTB standards are transformational. The required data and technology changes needed to support analyzing the coverage of risk factors in risk and pricing model architecture, as well as enhance market data observability processes under the internal models approach, are significant. A standardized approach that requires granular risk factor sensitivities will also need an overhaul of current market risk capital calculations and processes. While detailed implementation requirements will be further defined by rule making in each jurisdiction, banks should quickly launch or accelerate their strategic FRTB programs. Doing so will allow banks to thoroughly consider the business strategy and implementation implications and make FRTB program choices early enough to meet the significant demands.

**The Bank for International Settlements (BIS) is seeking to balance accuracy and rigor with safety and security and has chosen a complex and interdependent set of mechanisms to change the market's approach to trading book and market risk.**

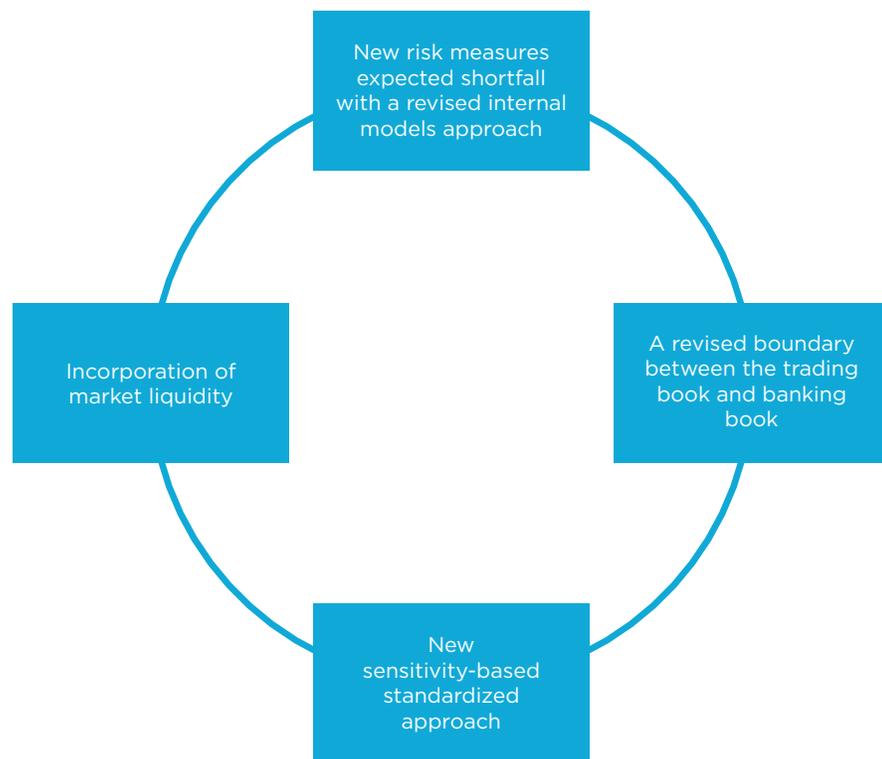


Figure 1: The FRTB engine includes a set of highly interacting component gears with a new revised standardized method.

Source: Chartis Research

FRTB facts:

- Biggest change to market risk capital requirements in over a decade
- Often referred to as BASEL IV
- Moving to historical simulation for value at risk
- More scrutiny of transfers between trading and banking book
- Asset liquidity – management and measurement
- Beyond a standard mandatory approach, more coordinated consistency

Banks have started looking at FRTB requirements and how they will affect their capital. Trading desks will be significantly affected because they will have to certify their models and how well these models capture daily P&L. The desks will also have to reconcile their forecasted vs. actual losses.

### TIBCO DATASYNAPSE GRIDSERVER AND AWS

TIBCO DataSynapse GridServer® can help YOUR financial services organization build a virtual super computer that automatically bursts to cloud resources on demand. You can dynamically scale any application automatically to make the best use of your high-performance computing investment.

Beyond daily calculations, emerging regulations such as FRTB call for exponential capacity to analyze, compute, and report. The TIBCO-AWS alliance offers infinite capacity at the switch of a button to expand your on-premises grid for regular risk needs or unforeseen market events.

The greater volume and complexity of data has spurred an unrelenting demand for additional processing power and speed, stretching your IT resources well beyond their current capabilities. As a risk and compliance manager, you need real-time, accurate results without sacrificing cost, flexibility, or competitiveness.

The powerful DataSynapse GridServer scheduler dynamically allocates resources in the cloud based on urgency of calculation tasks, allowing it to manage grid overload, SLAs, and many other factors. This flexibility allows you to tune your compute resources to match demand, avoiding the need to add on-premises resources. TIBCO has also added support for GPU, accelerating some calculations by two to three orders of magnitude.

The TIBCO-AWS combination enables real-time, high performance computing for:

- Risk analysis
- Trading simulations
- Interactive risk reporting and management
- A wide variety of financial modeling algorithms
- Parallel distributive computing grid



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