Achieving FRTB Compliance

Abstract

The Fundamental Review of the Trading Book (FRTB) released by the Basel Committee for Banking Supervision (BCBS) on January 14, 2016, brings the regulatory capital calculation much closer to the front office realm than previously. Banks will need to re-architect their straight-through processing (STP) chain and add a new analytics platform to handle the regulatory capital calculation. FRTB also imposes a review of boundaries between the banking and trading book. FRTB compliance will pose cross-functional challenges across the streams of data, business process, and IT infrastructure. This paper suggests an approach to overcome these challenges and ensure timely compliance.

Understanding FRTB Impact

Banks that plan to apply for the Internal Model Approach (IMA) approval for some of their trading desks will need to re-assess their book structures. Solving a multi-dimensional transformational equation is required, making any FRTB program a cross-functional challenge involving data, business process, and IT infrastructure. A full-blown FRTB program will therefore involve preliminary and subsequent phases across these three main streams (see Figure 1).

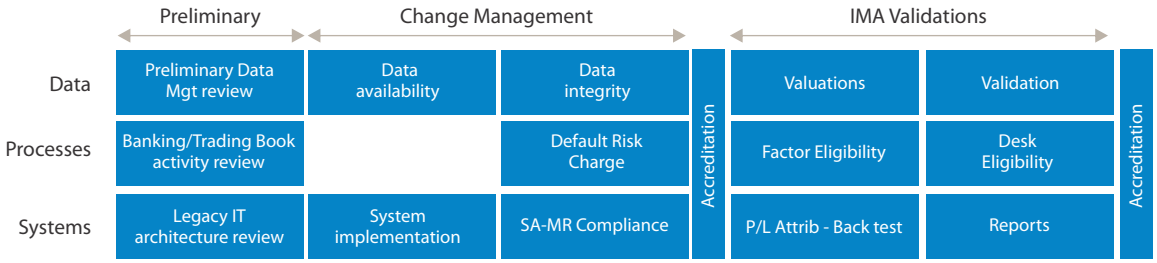

Figure 1. FRTB Program Phases

Stream 1: Data Governance and Integration

FRTB compliance is extremely data-intensive. The sourcing of critical data elements from the authorized data sources is the first requirement. The data can be classified into four different categories:

Master data: Largely gathered from various sources including exchanges and market data vendors for data such as securities master.

Reference data: Created as per requirement and maintained internally by the bank, for e.g., risk bucket definitions for standardised approach.

Transaction and position data: This is arguably the most critical data and reflects the bank's trading book, which is used to quantify various risk measures such as expected shortfall.

Market or time series data: This data is critical in modelling the risk measures such as Value at Risk (VaR) and Expected Shortfall (ES).

Let's look at the data needs for the key FRTB areas of IMA, P&L attribution, backtesting, and the Standardised Approach (SA).

The Internal Model Approach (IMA)

The ES must be calculated for two different sets of risk factors – a reduced set and a full set. Reduced set of risk factors is modelled for current as well as stressed periods, whereas the full set restricts itself to the current period. ES calculation for the stressed period requires much longer time series data and poses challenges for the market data system of banks. The risk factors also need to be categorized as modellable and non-modellable based on the regulatory criteria of having at least 24 real price observations per year, with at least one observation for every calendar month.

The default risk charge (DRC) calculation mandates the computation of the jump-to-default risk from issuer risk perspective. DRC computation requires calibration of default correlation among obligors, probability of default, and loss in case of default, for each obligor. This will require large amounts of market data.

Trading desks must pass the dual test of P&L attribution and backtesting to qualify for IMA. P&L attribution requires the calculation of hypothetical and risk-theoretical P&L. As passing P&L attribution is mandatory, high-quality risk and finance aligned data is necessary to obtain and retain IMA approval. Also, to obtain approval to use the IMA, backtesting needs to be passed, based on VaR measured at 99% and 97.5% confidence levels,[1] which requires a lot of reference data.

The Standardised Approach (SA)

SA is also demanding in terms of data. It consists of sensitivities-based approach (SBA), default risk charge (SA-DRC), and residual risk add-on (RRAO). SBA requires breaking the positions into various risk factors, classified under seven risk asset classes based on five categories – interest rates, FX, equity, commodity, and credit. The sensitivities must be combined with the correlations and bucketed under different categories for each risk asset class.

This approach necessitates much richer references for the various asset classes, with both master and market data to be provisioned. For example, finding equity delta risk weights requires knowing the sector of the issuer, economy to which the issuer belongs, and the issuer's market capitalization.

Streams 2 and 3: Re-engineering Business Processes and Re-architecting the IT Infrastructure

One of the operational changes deals with the boundary between the trading and banking book. The new definition of the trading book hinges on trade intents rather than on the nature of the traded instruments. Some of the challenges relate to the notion of internal risk transfers (IRT). These are banned from a regulatory capital point of view, unless the hedge occurs with an 'eligible hedging third party' (in practice, a CCP) and exactly matches the IRT.

FRTB applies stricter controls to trading activities as evidenced by the definition of the trading desk, its documented business strategy, and risk reporting mechanism. At a minimum, P&L, sensitivity, limit utilization, and compliance reporting will be required. These requirements translate into the need for full pricing transparency.

The front office will face challenges around merging multiple data sets, and integrating diverse curve and pricing methodologies into a well-controlled business and risk strategy. Moreover, since the regulator requires the risk management function to remain fully independent from trading activities, the existing risk structures will need to provide views on a desk-by-desk basis. Let's examine some of the key implications of calculating Market Risk (MR) using SA and IMA methods.

Changes Driven by SA-MR

The decomposition of exposure by risk factor and vertices, as required in SBA, carried out at trading desk level is one of the most disruptive changes proposed in FRTB. In terms of the IT architecture, it amounts to:

- Firms that have achieved STP vertically, i.e. using stand-alone applications dedicated to specific asset classes, will either need to create an additional platform to collect and process data at various levels of the processing chain, or evolve toward a cross-asset structure capable of computing multi-asset sensitivity.
- Firms having multiple front-and back-office applications based on the legal characteristics of the traded instruments (such as cash, derivatives, OTC, and ETD) will find it challenging to achieve the risk decomposition and data matching without a complete system overhaul.

- Firms already having horizontal integration, i.e. with a cross-asset front-office and a single back-office platform interfaced together, will be in a much better position.

The exercise of calculating SA-MR will highlight the sensitivity concentrations to the regulatory risk factors. This lends itself to an initial assessment of relevant risk factors for IMA-MR.

Changes Driven by IMA

IMA approval needs to be applied for and maintained at the trading desk level. Each trading desk will then be placed under the supervision of an independent risk manager, tasked with ex-post comparisons of risk measures with the actual P&L numbers, risk methodology audits, and data integrity. The risk manager will also need to verify that the regulatory capital models are the same as those used in the actual risk models.

Moving Toward Compliance

Figure 2 shows the steps required for FRTB compliance from both SA and IMA perspectives and highlights the steps that will have a strong impact on data or process.

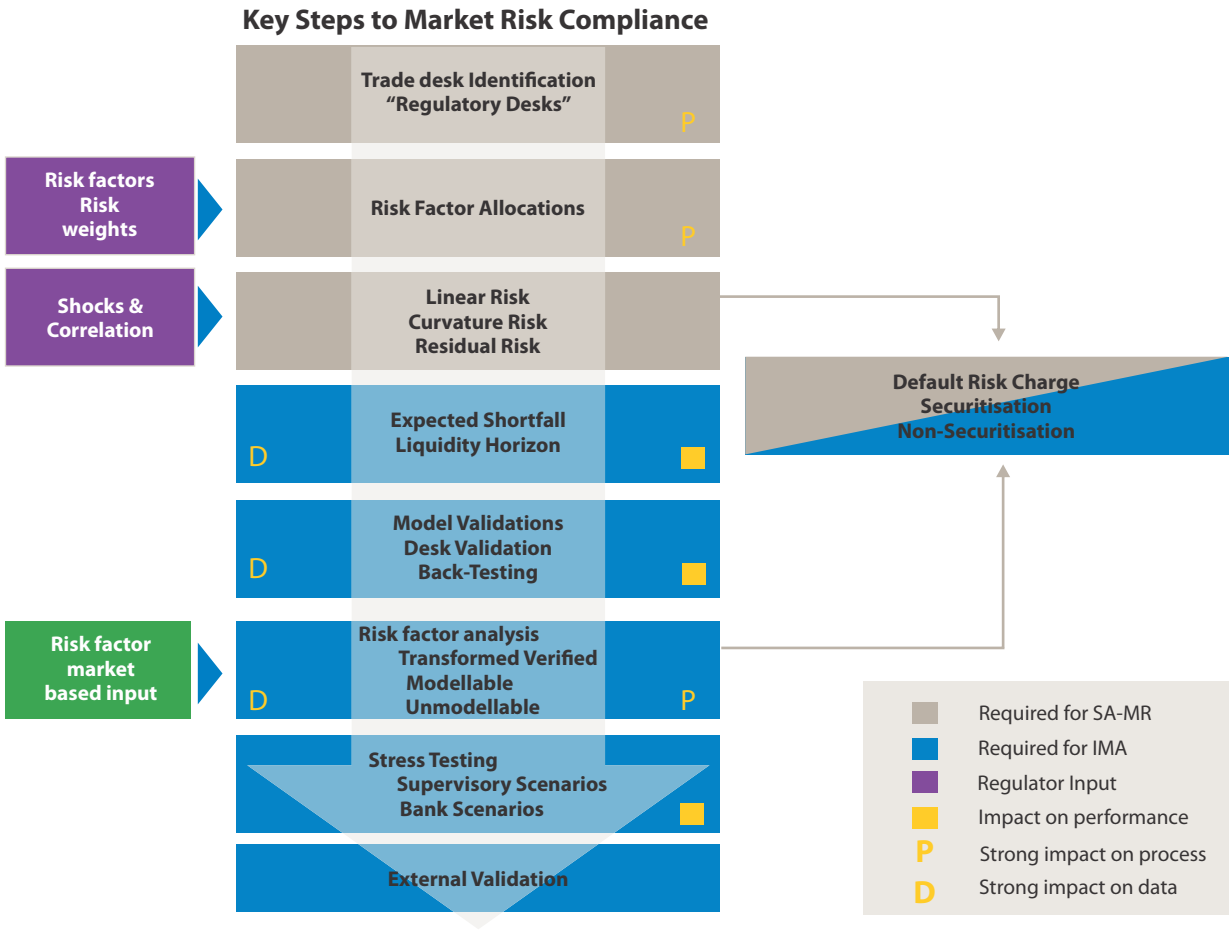

Figure 2. Steps to achieve FRTB compliance under IMA and SA

To create the necessary measures, a full revaluation-based approach is necessary for every combination of liquidity horizon, asset class, and risk factor set. Since compliance will depend on the convergence of those measures, it would be a real challenge trying to achieve it with different data sets or different P&L methodologies.

Based on previous studies of regulatory capital impacts, we recommend approaching the IMA-specific challenges related to models and risk factors in the following way:

- Identify the models used in the front and back offices, and verify and document them.
- Locate the data feed corresponding to each variable.
- Categorise valuation-critical data (internal, external, static, feed, calculated, and provided).
- Identify data sources and contingency data sources.
- Rank the quality and reliability of each data point (acquisition, consistency, reliability).
- Define the initial status (red, amber, or green) and KPI into a compliance data nomenclature (CDN) at the trading desk level.

Dedicated FRTB Platform: The Need of the Hour

A dedicated FRTB platform must feature a robust data model to accommodate the eligible transactions, shocks, relevant curves, and surfaces without the need to import them. The platform should combine modern data processing with the functionalities of a valuation hub, featuring static and streaming data, curves, pricing models, and so on through multiple P&L calculation requirements. The platform must have the potential to directly provide input to back office and accounting. The new platform should not function in a standalone fashion, but rather be an integral part of the STP process itself.

In terms of implementing the new risk and capital calculation system, it is likely that many institutions will opt for a phased approach, starting with SA and then proceeding to implement IMA. Banks with an integrated cross-asset infrastructure will likely find it quicker and easier to meet the FRTB requirements as data is easily available at a central repository.

Banks that have previously used internal models will find the new approach challenging. In our view, the necessary changes in operating models and IT infrastructure could be just as disruptive as the financial implications of higher capital charge. Also, FRTB will drive many banks to introduce a new platform for data management and risk calculation, which will exist between the front- and back-office operations. The platform will warrant the integrity of risk calculations as part of the daily operations, and address the ever-increasing demands on risk analytics for regulatory compliance.

References

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