CLOUDERA

Readying for the Fundamental Review of the Trading Book

An efficient approach to the new regulations

Compared with the Basel 2.5 framework, the amended framework is estimated to result in a median increase of 16%, and a weighted average increase of 22% in market risk capital requirements.[2]

The Fundamental Review of the Trading Book (FRTB), introduced by the Basel Committee on Banking Supervision (BCBS), will transform how banks measure risk as part of their key requirements, shifting from value at risk (VaR) to primarily an expected shortfall (ES) metric. BCBS has reported that the updated framework is estimated to increase market risk capital requirements by 22%, on average.[1]

Affecting major banks globally with trading activities (whether their own or on behalf of their customer), these new market risk capital requirements took place in January 2023.

Value at risk was identified to have fundamental weaknesses that did not address the risk associated with the trading book, despite the introduction of the Basel 2.5 framework. FRTB is designed to address such risks and determine capital requirements aligned with market risk factors (interest rates, stock prices, etc.) that can be modelled, risk factors that cannot be modelled and potential default risk of the trading book.

Overall, FRTB increases scrutiny on the trading desk at a granular level that will require increased quantities of historical data and increased analysis and computations against this data.

Proven Data Leadership in Financial Services
Leading firms globally run on Cloudera to support their data and analytics strategies including

- **82 of the top 100** Global Banks
- **27 of the 30** Global Systemically Important Banks (G-SIB)
- **4 Largest** Credit Card Networks
- **8 of the 10** Largest Wealth Management firms

Model Impacts
FRTB places increased scrutiny on the model for measuring capital requirements and adds rigor to the measurements in either model chosen.

Standardized Approach	Internal Model
The standardized approach uses a fixed formula. It is utilized when a bank does not have its own capital model, for example, in emerging markets. It has a higher capital charge, which may push a bank to develop an internal model to avoid such requirements.	An internal model refers to a bank's own capital model, tailored to its own business. It is usually created to drive savings in capital charges.

Though not the intention of FRTB, capital requirements are expected to increase.[3] To minimize such charges, banks need to justify why the internal model is more accurate and how it is different from the standardized approach. The choice of an Internal Model vs. a Standardized Approach comes down to the decision on which method gives a more appropriate level of capital for the risk that a firm is taking. Most banks should perform quantitative impact studies to compare the two methods for their trading business.

An institution will need to conduct this comparison for each individual trading desk portfolio; requiring an increase in calculations. The European Central Bank Banking Supervision conducted a questionnaire to assess the impact of the new rules on the internal models. The responses, collected in 2019, indicated that "approximately 40% of the banks using the internal model approach (IMA) intend to seek IMA approval under the new rules."

With the new guidelines, continuous monitoring is required, in addition to back-testing to ensure standard and internal approach accuracy.
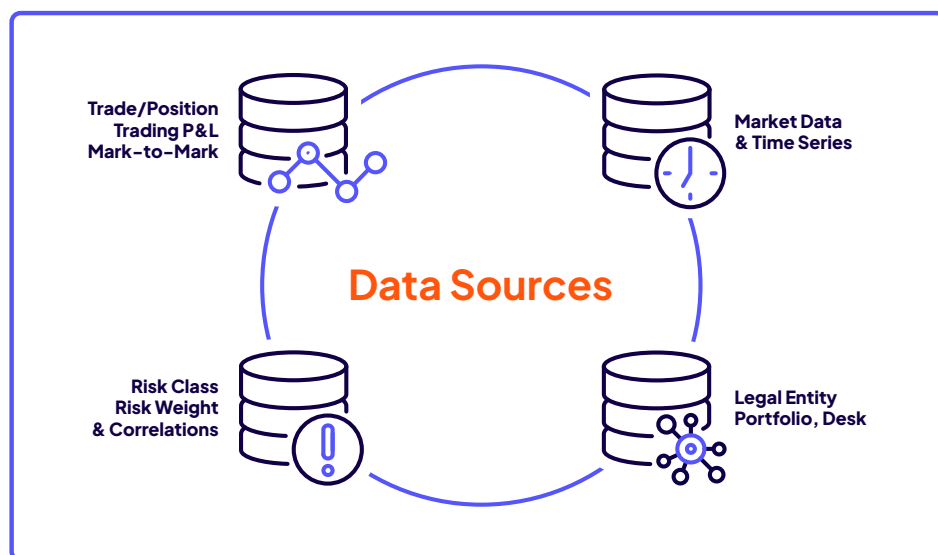
To effectively address these requirements, banks will require exponentially more historical data storage and compute power. Cloudera estimates that approximately 24x increase in historical data storage is needed and 30x increase in computational requirements. Banks will need expanded capabilities for a centralized and secure single view of risk data and a complete audit trail(s) for data, models and risk calculations. Additionally, FRTB will require a machine learning ops framework that supports regular back testing and P&L attribution testing as required by the risk model framework.

In this manner, FRTB puts a spotlight on the data sources utilized, and the management and governance of the data used in these complex models.

- **Data Variety**: Banks may seek additional data sources both internally and sourced from third parties (ex. Bloomberg) to complement the trade data they already have and to support the validation of market pricing information. This information may be available in real-time or batch end of day feeds.

- **Data Volumes**: The ES metrics require a longer history, thus driving an increase in the data storage requirements. This includes data such as risk classification, quotes, risk weights, etc.

- **Data Lineage and Security**: The data must be managed consistently with proper security and governance, with data lineage and traceability maintained across environments and models.

Data Sources

Trade/Position Trading P&L Mark-to-Mark

Market Data & Time Series

Risk Class Risk Weight & Correlations

Legal Entity Portfolio, Desk

Cloudera

Cloudera offers financial institutions a unified data and analytics platform to manage and model risk exposures to drive improved risk management and enable risk digital transformation. It supports big data, machine learning and predictive analytics to enable improved risk modeling and compliance support for FRTB and across the enterprise to support CCAR/EBA Stress Testing, BCBS-239, MiFID II, IFRS-9, IFRS-17, etc. Cloudera enables financial services entities to:

1. **Ingest, process, analyze and drive risk analysis in real-time** from high volumes of streaming data including market data, transaction data, alternative data and traditional enterprise data sources such as core banking, treasury and trading platforms, etc.

2. Deliver **timely, consistent risk analytics** across lines of business. **Build, test, iterate, deploy, and monitor** machine learning models to enable advanced risk analysis.

3. Execute **multiple analytical options** (from SQL Analytics and tooling for BI engines to supporting the latest machine learning and AI algorithms) in order to drive intelligence and action from data at the edge, on premises, or in any public, private, or hybrid cloud.

4. Maintain strict enterprise **data security, governance**, compliance and data lineage across environments.

Risk related data sources are expanding not only in volume and velocity but also in the variety of data types–structured, semi-structured and unstructured. Cloudera manages streaming data such as interest rates and stock market activity. It supports massive volumes of data ingests to serve the real-time data needs of an enterprise and to support the FRTB modelling requirements including this volatile data.

Why Cloudera
Cloudera enables financial services providers to effectively execute their data and analytics strategy to address current and evolving customer expectations.

Edge to AI Analytics
All the functions needed to ingest, transform, query, optimize, and make predictions from data are integrated, eliminating the need for costly point products.
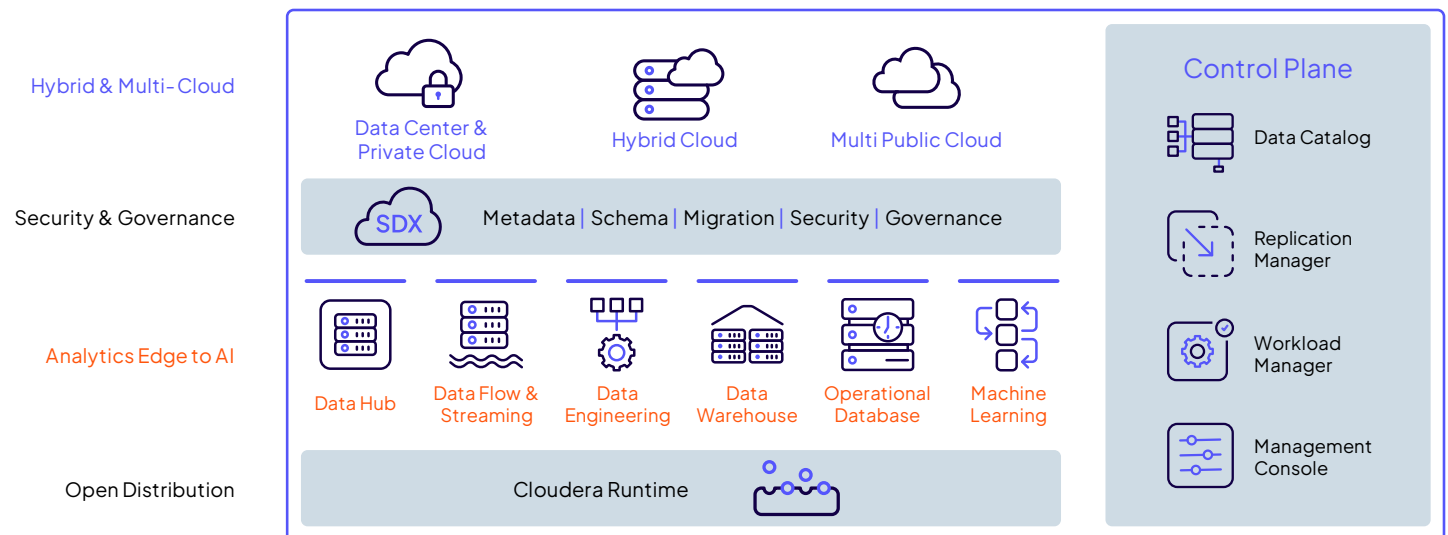
Data Security & Compliance
Maintains strict enterprise data security, governance, and control across all environments.

Hybrid and Multi-Cloud
Delivers the same data management capabilities across data centers, private, and public clouds.

100% Open Source
Open compute and open storage ensures zero vendor lock-in and maximum interoperability.

Agile and Cost Efficient

Cloudera enables an efficient approach to the data and analytics challenge surrounding risk management and modelling across the enterprise. Cloudera operates across the major public cloud providers, private cloud, on premises deployments and is based on 100% open source technology. Cloudera automatically scales resources as demand increases or scales down as workloads wind down. This ensures optimal performance and cost efficiency when activities such as stress tests require more resources.

Shared Data Experience (SDX)

Cloudera's approach to the enterprise wide data security and privacy challenge is SDX—Shared Data Experience. SDX enables a common security, governance and compliance layer that is manageable and provides confidence that the data is protected. SDX enables safe and compliant self-service access to data and analytics. Multi-tenant data access and governance policies are set once, and automatically enforced across the data lifecycle in hybrid as well as multi-clouds. SDX reduces security risk and operational costs by delivering consistent data context across deployments.

Efficiently Manage FRTB

Cloudera offers a comprehensive platform that can model and monitor risk exposures on-demand. Cloudera offers a scalable infrastructure and standardized data structure to absorb expanding data sets and manage increased compute demands. Cloudera enables a data strategy that meets the demands of FRTB and is agile to adjust to new and evolving requirements as they come forward in the future.

Sources:
[1]Basel Committee on Banking Supervision https://www.bis.org/bcbs/publ/d457_inbrief.pdf
[2]BIS, Basel Committee on Banking Supervision https://www.bis.org/bcbs/publ/d457_note.pdf
[3]ICMA Group https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/Secondary-Markets/secondary-markets-regulation/fundamental-review-of-the-trading-book-frtb/

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Cloudera is the only true hybrid platform for data, analytics, and AI. With 100x more data under management than other cloud-only vendors, Cloudera empowers global enterprises to transform data of all types, on any public or private cloud, into valuable, trusted insights. Our open data lakehouse delivers scalable and secure data management with portable cloud-native analytics, enabling customers to bring GenAI models to their data while maintaining privacy and ensuring responsible, reliable AI deployments. The world's largest brands in financial services, insurance, media, manufacturing, and government rely on Cloudera to be able to use their data to solve the impossible—today and in the future.

To learn more, visit Cloudera.com and follow us on LinkedIn and X.