

Emerging Market Risk Challenges and FRTB

New regulation governs market risk models and increases the capital buffer but only addresses a portion of emerging market risk challenges



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The financial services industry will need to face significant challenges head on – particularly the ability to measure and manage firmwide market risk intraday and on demand. In the age of “Flash Boys,”¹ with analysis and trade execution in milliseconds, it is surprising that enterprise market risk systems for most banks are still based on legacy technology and overnight batch processes. The whole system is designed to optimize real-time leverage and profit – not to manage firmwide and systemic market risk.

Market risk is on the rise

Regulators are carefully watching for systemic challenges, fearing that excessive market risk across interconnected actors might lead to another financial collapse. They have cause for concern. At the start of 2017, US lending was back to 2008 levels of just under \$2 trillion, and ISDA (the International Swaps and Derivatives Association) reported notional CDS (credit default swaps) approaching \$10 trillion – a highly leveraged 5:1 ratio. Secondary market loans with recourse ensure swaps continue to be used to hedge exposures. Meanwhile, insurance companies buy and hold increasingly large CDS positions while borrowing in turn from the banks to meet capital requirements.

When banks capitalize insurers to hedge their highly leveraged loan derivatives, it drives interconnectedness risk – rendering a picture that keeps regulators up at night. The regulators believe mitigating contagion will require banks to achieve an intraday view of market risk in the trading book and analyze their positions within the context of the overall market.

This white paper takes a broad view of current market risk challenges that concern regulators and selected steps they are taking, such as Fundamental Review of the Trading Book (FRTB), along with further actions planned. Management at any bank with a trading portfolio over \$300 million – chief financial officer, chief risk officer, line of business managers, risk managers and analysts, traders and auditors – will want to consider this paper and its sources as they plan compliance and market risk strategies.

The dangers of interconnectedness and contagion

Market risk in the trading book is the result of exposure to price movements, changes in market structure or events – from earnings reports to economic and political risk. Market risk may also be incurred through software and systems technology errors – for example flash crashes that continue to occur despite exchange “circuit breakers.”

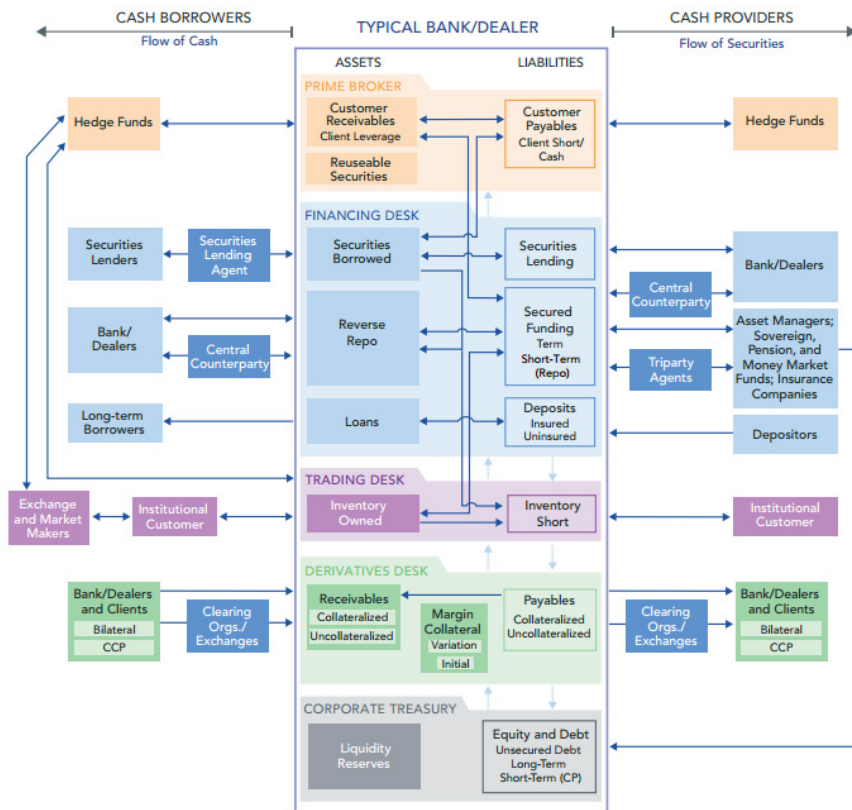
Beyond the impact of recognized losses at a desk level, a drop in the value of underlying collateral results in margin calls with an immediate impact on firmwide liquidity. Evaluating market risk and planning for its potential impact on liquidity is therefore critical. Additionally, a firm’s CDS products may drop in value if the market perceives they are over-leveraged or under stress. The resulting increase in the cost of issuing credit default swaps is closely watched, and investors will drive down the value of its equity.

¹ *Flash Boys*, the 2014 New York Times best-seller by Michael Lewis, focuses on the rise of high-frequency trading in the US equity market.

These examples highlight the fact that assessing market risk independently within a single firm will only reveal part of the total picture that regulators find so worrisome. Market participants continuously transform short-term funding assets and collateral as they flow through the financial system. Therefore, tracking these interconnected transformations is the key to enhanced understanding and mitigation of systemic risk.

In their July 2016 Office of Financial Research (OFR) Brief, Looking Deeper and Seeing More: A Multilayer Map of the Financial System, Richard Bookstaber and Dror Kenett describe systemic market risk implications for assets that change and amplify risks as they flow across market layers. They explain how network analysis reveals these multiple layers of interconnectedness and potential for contagion “where banks, CCPs, hedge funds, pension funds, insurance companies, exchanges and institutional customers are visualized as nodes.” They propose an approach that allows modeling of risks both on the market participant level and the activities, or markets, themselves. This enables a modeling framework that can capture risks both on the individual level and on the market or systemic level.

The authors visualize the overall market in a multidimensional capital markets diagram that highlights the relationships among banks/dealers and related entities, including funders and borrowers plus collateral and assets. The fact that this study was published through OFR offers additional proof that regulators are looking carefully at these issues – from layered risk to potential contagion.



Note: Key market participants and bank/dealer desks involved in funding are displayed in dark colors; others are shaded lightly.
Source: Authors' analysis

Figure 1: This diagram of key capital market participants exposes interconnected relationships across the capital markets that can lead to contagion. Source: OFR

Much of what regulators are worried about and plan to address regarding market risk contagion is reflected in their publications. The US Committee on Capital Markets Regulation published a study for the Treasury Department in 2012 on interconnectedness risk and contagion,² and this study continues to drive market risk regulatory strategy in 2017.

While the Trump administration has been sending conflicting messages – advocating both for the rollback of Dodd-Frank and the reinstatement of Glass-Steagall – what remains clear is that inadequately monitoring and managing market risk could lead us into another systemic crisis. Secretary Steven Mnuchin’s Treasury Department understands this perfectly well and is pushing toward tighter controls to mitigate market risk and head off the potential collapse of our highly interconnected global financial system.³

FRTB: A first step to address market risk

The strategy to address market risk is tightly coordinated by US Treasury through the OCC (Office of the Comptroller of the Currency), which in turn has been working closely with the Bank of England and European Banking Authority. To date, these organizations have steadily advanced the agenda to address systemic risk and will ultimately require banks to measure and manage market risk and its impact on the intraday trading book as well as the overall market.

Beyond on-demand analysis and reporting, they will harden and extend the separation of the banking and trading book. Banks will be required to ringfence their lines of business (financially separating portions of a company’s assets or profits without necessarily being operated as a separate entity). This approach creates firewalls against the spread of market risk.

In the near term, market risk challenges are partially addressed within the Minimum Capital Requirements for Market Risk, also known as the FRTB, announced by the Basel Committee on Banking Supervision (BCBS) in January 2016.

All banks with trading positions will be required to meet the FRTB regulation, which will directly affect a bank’s balance sheet, capital, business model, market data and analytics software technology. The timeline for implementation may vary, but full compliance is required by Jan. 1, 2019.

More conservative risk modeling. More conservative guidelines for modeling risk are addressed through a prescriptive “Standard Approach” and an “Internal Model Approach” including expected shortfall (ES) to estimate the impact of extreme events. A liquidity horizon matrix adds additional capital requirements for illiquid instruments that were treated on an ad hoc basis by the Basel regulatory framework.

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Regulators are moving to require (A) more conservative market risk modeling that realistically assesses a firm’s risk in the context of the overall market, and (B) separation of activities from both a capital and business structure point of view.

² *Interconnectedness and Contagion*, prepared by Hal S. Scott with assistance from the staff of the Committee on Capital Markets Regulation, Nov. 20, 2012

³ From a March 2017 interview by the author with Gabriel David of Burnt Oak Capital, advisor to Bank of England.

As shown in the table below, FRTB's modeling approach will increase the capital required to offset market risk in the trading book. By BCBS estimates, banks will see a 28 percent median increase using the internal model approach and as much as an 80 percent increase using the standardized approach.⁴

$[(\text{Revised capital charge} / \text{Current capital charge}) - 1]$	25th percentile	75th percentile	Median	Sample size
Internal models approach (partial sample)	-20	45	28	12
Internal models approach (full sample)	-35	45	-3	44
Standardised approach	55	135	80	21
Total	-28	100	27	39

Figure 2: Source: Basel Committee on Banking Supervision

Clearer boundaries between banking and trading books. Financial institutions often understate market risk by recording trading positions as "assets held to maturity" on the banking book. Through this "regulatory arbitrage" they avoid the "mark to market" requirements and enjoy lower capital buffers. FRTB introduces a revised boundary between the banking and trading book, with stricter rules for the transfer of trading positions, plus capital surcharges that reduce understatement of market risk through this practice.

Reining in certain hedging strategies. FRTB also addresses understated market risk stemming from selected hedging strategies. Currently, a hedge in the banking book may be associated with positions in the trading book, and hedged positions may benefit from generous assessments. Going forward, hedges in the banking book – for example, for a corporate bond using a credit default swap posted in the trading book – may not be recognized as offsetting by regulators. Better alignment of hedging strategies with more conservative modeling will mitigate exposure to extreme events.

These steps are designed to conservatively measure and manage market risk, separate the banking and trading book and increase the capital buffer.

Where FRTB falls short

FRTB is a start, but there are some perceived shortcomings, and further steps will likely be required:

- Regulators would argue FRTB does not go far enough toward measuring firmwide, intraday market risk.
- FRTB does not sufficiently require firms to analyze risk in the context of the overall market.
- FRTB only takes "accounting steps" to separate the banking and trading book while still permitting capital to flow across and cover intraday shortfalls.

FRTB defines risk modeling approaches that will result in more conservative analysis and management of market risk in the trading book and will lead to increased capital buffers. These buffers thus establish higher minimum capital requirements to offset risk in the trading book.

⁴ Basel Committee on Banking Supervision, Explanatory Note on the Revised Minimum Capital Requirements for Market Risk, January 2016

Therefore, several strategies are being considered beyond FRTB to more fully address the broader market risk challenge and mitigate the potential for runaway contagion.

Five strategies beyond FRTB to address market risk

1. Measure and manage intraday market risk

Most banks are unable to measure intraday market risk across the firm. In many ways, this is a cultural and historical issue rather than a technology challenge. Banks appear to be satisfied with batch processes that produce regulatory reports purely for compliance.

However, as financial firms gain access to market risk data on demand, they tend to use this data to improve their business. With stress testing, CEOs of major banks speak of the benefits, from immunizing the balance sheet to optimizing capital. Steps by regulators to change when market risk is measured and how it is managed will be a catalyst for change, but banks that move proactively will likely see positive ROI and competitive benefits.

2. Analyze risk in context

Risk reporting will need to include contextual data from the overall market and its related dynamics. Part of the challenge is that internal and external data is dispersed or intermittent. Exchange-traded derivatives and data standards will increase transparency over time, but the banking industry must act now.

Regardless of the challenges and imperfections, systemic market risk must be measured and addressed. This requires assessing the status of counterparty, settlement, political and economic risk factors. Banks will be asked, "If your counterparty failed a stress test, why should you pass?" An understanding of the firm's positions in the context of the global market cannot be avoided.

3. Prepare for spot checks

Another test regulators will drive to ensure sufficient monitoring of intraday market risk is spot checks. These spot checks will intensify, and banks will be required to assess their firmwide market risk within minutes, effectively inserting probes into the trading book. This process will force realignment of operations and workflow, providing an aggregated view of transactions across the front, middle and back office on demand.

4. Prepare for ringfencing

Regulators plan to directly address market and interconnectedness risk through ringfencing. This approach will crystallize the boundary between the banking and trading book as well as between lines of business.

Currently, financial institutions may cover intraday shortfalls in the trading book with capital, loans and collateral from the banking book. Ringfencing is intended to prevent this practice, forcing each line of business to stand on its own and establishing firewalls to prevent contagion.

However, market risk and its potential impact on intraday liquidity would have to be very well managed. Banks will also need to plan for potential reduced credit ratings of any lines of business cut off from the parent company by ringfencing.

The impact on operating expenses would also need to be evaluated. As the separation of the banking and trading book hardens into ringfencing, regulatory costs as a percentage of operating expenses are likely to double from an average of 4-6 percent today to 8-12 percent. Investments in technology may be needed to mitigate these expenses.

5. Address the technology challenges

Delivering intraday, on-demand analysis of market risk will require moving from existing batch processes to a modern, firmwide model risk management platform that embodies four key attributes:

A solid data foundation. While granular data is available at the desk level, detailed transactional data is typically not available from across the enterprise on demand. Firmwide standards for reference data and data quality, along with data aggregation and mapping to analytic engines, will be required.

Integrated workflow from data to reporting. Once data is ready for analysis, orchestrated and well-controlled workflow processes will be required to direct it into multiple computing environments and then aggregate the results into management summaries and visualization reports.

Governance. The risk management solution must have the capability to control the entire analytical model life cycle, from development and testing to deployment and ongoing management. Understanding relationships among models while ensuring quality testing and deployment is essential to prevent unexpected trading glitches, such as the flash crash at Knight Capital Group, where trading activity triggered by flawed software caused a major disruption in the stock prices of 148 companies.

Scalable performance. FRTB analytics need to be highly scalable, since selected scenarios – for example, those with extended liquidity time horizons – call for up to 15,000 valuations per trade. Typically this will require in-memory, high-performance computing analytics with real-time load balancing to optimize the use of computing resources.

What banks should be doing now

While few banks report FRTB projects underway, it would be a mistake to view this regulation as an isolated event, when the real challenge is to prepare for a sea change. Furthermore, while the focus of FRTB is currently on investment banking, private equity and trading functions, it will expand to address market risk challenges in the asset management and custodial functions of the bank as well.

Ideally, banks will achieve the ability to evaluate risk and measure its potential impact on liquidity, concentration and interconnectedness in time to respond. This capability will require a wholesale review of legacy systems that were not designed to provide on-demand, aggregated data together with analytics, workflow and reporting. It will

As the separation of the banking and trading book hardens into stricter ringfencing of business lines, regulatory costs as a percentage of operating expenses are likely to double from an average of 4-6 percent today to 8-12 percent.

Firms without a streamlined and automated modeling platform will be hard-pressed to manage disparate development, testing and deployment of FRTB models.

Modernizing the firm's model risk management infrastructure, workflow and governance should be an early priority, to identify gaps in the data, reconciliation challenges between risk and finance, mismatched hedging, and implications for the business.

also require a review of each line of business to determine whether realignment or retrenchment is necessary.

The good news is that initiatives to meet the regulatory requirements will fortify the bank's understanding of its true market risk position. We certainly heard that sentiment from bankers at a recent FRTB roundtable:

"Some of the FRTB-related things that we already do are simply not done anywhere near as structurally and consistently as we should be doing them."

"There are genuinely a lot of things FRTB is forcing us to do that are positive and that we should be doing anyway."

A handful of leading international banks and investment managers who have established the ability to measure intraday market risk – such as JPMorgan Chase, Goldman Sachs and Blackrock – cite benefits such as improved risk management, capital optimization and balance sheet immunization.

Rather than follow a wait-and-see, reactive approach to new regulations, financial institutions should evaluate their capabilities against best practices and industry leaders, then move proactively to measure and manage firmwide market risk in context. These early movers will be the first to benefit from improved enterprise risk and capital management, automated workflow with a lower cost structure, as well as new sources of data and market intelligence to drive revenue and achieve business objectives.

Learn more

[Explanatory Note on the Revised Minimum Capital Requirements for Market Risk](#), Basel Committee on Banking Supervision, January 2016.

[The rise and fall of the hottest financial product in the world](#), Chris White, Business Insider, August 16, 2016.

[Assets and Liabilities of Commercial Banks in the United States – H.8](#), data from the Board of Governors of the Federal Reserve System, April 14, 2017.

Office of Financial Research (OFR) brief, [Looking Deeper and Seeing More: A Multilayer Map of the Financial System](#), Richard Bookstaber and Dror Kenett.

About the author

Roger Lang has more than 35 years of financial services experience, including banking and treasury, trading and risk solutions development, consulting and sales. Lang works in product marketing, supporting the SAS Risk and Quantitative Solutions group. Previously he spent 20 years at HP, led working groups for the Financial Services Roundtable, and directed the Wall Street Cornell Theory Center. He holds a BS in international business from New York University.

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