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FRTB Special Report

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INTRODUCTION

The Fundamental Review of the Trading Book (FRTB) has gone through numerous incarnations, consultations, industry reviews and re-evaluations in its seven-year history. But throughout its evolution one element has remained constant: the transformative change that the new rules will bring to the way firms gather, process and store their trade data.

From its beginnings in 2012, FRTB was a hard-hitting prospect – revolutionising the way firms manage market risk by imposing aggressive capital requirements and reporting responsibilities both on individual trading desks and at an enterprise level. Although subsequent iterations have toned down some of the more onerous obligations, there is no doubt that firms affected by the new regulation have much to do; at the heart of the requirement is the need to adapt their data management policies to the new climate. Those who succeed could achieve competitive advantage as well as improved operational efficiency, while those who have not yet established FRTB programmes could find themselves left behind. Although it's been said before, time is running out – and implementation is arriving sooner than you might think.

Despite some previous doubt over final deadlines, the Basel Committee on Bank Supervision (BCBS) clarified the situation in January 2019 with the release of a new and revised Standard for Minimum Capital Requirements – a final version that incorporates some of the changes proposed from the last industry consultation period in March 2018, and enforces a conclusive implementation date of January 1, 2022.

FRTB's final version does relieve some of the original burden on banks, and could reduce compliance costs – currently estimated at around $5 billion. Once implemented, the revised framework is expected to result in a weighted average increase of about 22% in total market risk capital requirements relative to the Basel 2.5 framework. By contrast, the previous framework issued in 2016 would have resulted in a weighted average increase of about 40%.

The revised standards include a number of key changes to the original plan, such as

- The introduction of a simplified standardised approach for banks with small or non-complex trading portfolios;
- A clarification of the scope of exposures that are subject to market risk capital requirements;
- Revised treatment of foreign exchange risk, index instruments and options;
- An updated P&L attribution test; and
- A relaxation of the requirements for identifying risk factors for internal modelling and non-modellable risk factors.

However, this does not mean that affected institutions should rest on their laurels. Both the Basel Committee and the EU authorities have highlighted the importance of effective execution, and banks not ready by the 2022 deadline could find themselves facing severe penal measures.

"The revisions to the market risk standard fix the outstanding design and calibration issues in a way that facilitates timely implementation," stressed Stefan Ingves, Chairman of the Basel Committee and Governor of Sveriges Riksbank. "The revisions [will] allow banks and supervisors to implement the framework in a timely manner," added Mario Draghi, President of the European Central Bank.

This Special Report from A-Team Group provides a comprehensive roadmap to the specific data requirements imposed by the new FRTB rules. It offers institutions insight into the key challenges of implementation, the competitive and commercial opportunities stemming from effective enterprise-wide application, and the potential threats from late execution or non-compliance.

Explore the challenges of data sourcing, data lineage, data management, capital calculations and reporting requirements. Understand the timeline of the regulation, and learn what is needed to help your business effectively comply within the limited timeframe available.

In partnership with Refinitiv, a leading provider of FRTB compliance solutions including Tick History data, extensive reference data and the powerful new Connected Risk platform, A-Team Group is delighted to present our inaugural FRTB Special Report.

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FOREWORD

BY KAYLASH PATEL, HEAD OF ENTERPRISE ANALYTICS, REFINITIV

The Fundamental Review of the Trading Book (FRTB) is at heart an update to the market risk regulations outlined by the Basel Committee on Banking Supervising (BCBS). To fully appreciate the new framework we need not only to understand how and why banks calculate capital, but to recognise why those regulations needed updating in the first place.

At its heart

In regulatory terms, banks have two choices to calculate their capital. One is known as the standard model, which is prescribed by the regulator. The second is what is known as an internal model. Under that internal model approach, banks tend to use what's known as a value-at-risk (VAR) model: a statistical model that uses historical market data to help interpret what will happen in the future to a trading portfolio.

What both Refinitiv and the regulators have recognised over the years is that there are a number of gaping holes in both the standard and internal models that need urgent plumbing. Due to these holes the risks being captured and analysed, and the capital being reported against them, do not always accurately reflect day-to-day trading activities.

While the BCBS put in some quick countermeasures post-2008 in the form of Basel 2.5, ultimately the goal was always to completely reform the entire set of trading rules – and this is what we now see in FRTB.

But things are never quite that simple, and as has already been pointed out, there have been numerous iterations of the guidelines: with edit after edit attempting to reach a stage where the framework will be accepted by the industry while still meeting the rigorous requirements insisted upon by the BCBS.

Moving forward

That has created its own headaches – but with a final draft published (on 14 January 2019) it looks like we are at last moving towards a consensus. And with a firm implementation date of January 2022, it is becoming increasingly urgent for banks to adhere to these standards if they want to be involved in trading activity.

The advantages, if you get it right, are significant. You will be able to access a greater pool of consumers and customers on the trading book activity, and you will have a broader reach of asset classes that you can be involved in. However, getting it wrong means you have to set aside far more capital, and you become much less efficient. As a result, we are already seeing banks review their desk structure and review their asset classes to avoid punitive measures and ensure they can continue to offer a profitable return on capital. To do this, it is vital that you have the correct structures and processes in place to properly capture the required risks.

While the standard model is arguably more calculation-intensive, we have found that the real focus from banks is on the internal model – and it is here that things can get tricky. The new P&L attribution test with updated back-testing requirements, the risk factor eligibility tests: these new elements mean that banks are now finding it significantly harder to get approval to use internal models, and even if they do, the implementation costs have become significantly more expensive.

Our clients originally warned that there could be at least a 50% increase in capital for banks using the internal model. Even following the latest modifications of January 2019, quantitative impact studies suggest a potential rise of between 20-30%, meaning that there could be a huge increase in banks who no longer see the benefits from using internal models.

Damage limitation

So what is the best way to handle this challenge?

What we are hearing from our clients and the regulators is that ultimately, banks are no longer able to manage this process by using their own internal data. If you only see what you trade, you have a lack of visibility that will limit

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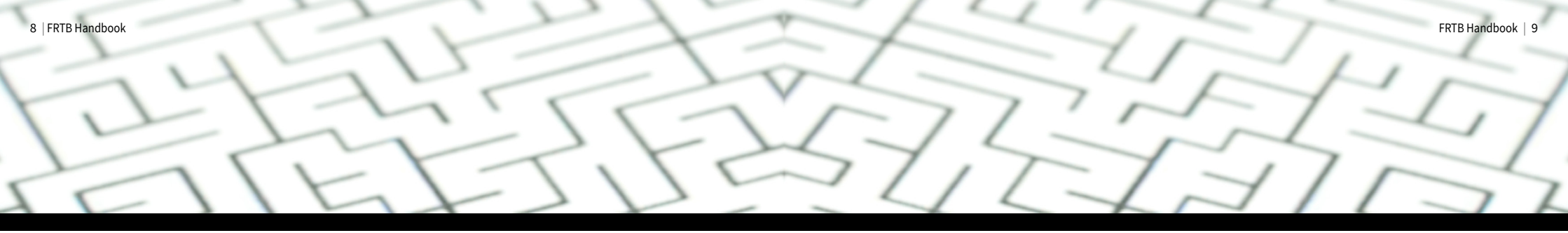

your ability to accurately calculate market risk. Therefore, banks will from now on have to collect a lot more data to run their processes. And that poses a new potential issue. Banks don't want to be data aggregators. They want to focus on what they are good at; and concentrate on the businesses that will provide an effective return on their capital.

The obvious solution is to collect data together from a variety of external sources as needed. But that opens a whole new can of worms around privacy issues. Do banks really want to pool data, with all the inevitable problems around proprietary information and sensitive trading activity that this would bring? That is a very difficult hurdle to cross.

The challenge that lies at the heart of FRTB is therefore, inevitably, data. Banks need access to much more market data - standardized, normalized, tick-by-tick data going back at least a decade - and they need it in a form they can use, understand, manipulate and report.

That is a huge task, and time is running out. Even though the deadline is three years away, we have already arrived at the last feasible point that banks can start to achievably assemble the market data, reference data and trade observation data that they will need to run these essential processes.

Help is at hand

So where are we now? What we are hearing from banks is, reassuringly, that their FRTB programs are already in full swing. Banks are looking at the impact of the new rules and assessing which desks will stay and which will go; running parallel processes; looking to find the data they need; and building up those services that will help them to understand how their capital will be affected.

And Refinitiv is helping them to do so. We have been building market risk-relevant solutions since pre-2008 and over the years since the new framework was announced we have rolled out an entire suite of products to assist banks with FRTB compliance.

For example, our Tick History data platform offers an archive of real-time pricing data, covering OTC and exchange-traded instruments, drawn from more than 500 trading venues and third-party contributors, over a universe of more than 70 million active and retired securities, and with coverage extending as far back as 1996.

Our Connected Risk platform provides workflow solutions that clients can leverage on top of the calculation process to make sure that all calculations are vetted and audited before they get out to the national supervisors.

And we are constantly looking at new solutions. This year we are rolling out a brand new trade observation repository, working with market participants and infrastructure providers for trade processing to collect and consolidate a data platform where clients can extract the real observations they need from a trusted, independent third-party source.

Banks have a long way to go, and a lot of work to do, before they are able to meet the robust new requirements imposed by one of the most sweeping reforms of the financial regulatory landscape of the past two decades. Refinitiv is your trusted partner, accompanying you at every stage of the journey to provide the tools you need to accurately meet the enormous data demands of this mammoth change.

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OVERVIEW

At its heart, the Fundamental Review of the Trading Book (FRTB) sets out to address the management of risk within financial firms' trading books. To achieve this, FRTB aims to address weaknesses in the current regulatory capital framework, imposing more rigorous qualification and constitutional requirements for both the trading and banking/investment books.

As such, FRTB will require firms to change their approach to trading book operations. The requirements may involve significant infrastructure investments, forcing some practitioners to reconsider their continued involvement is certain market activities.

With the 2022 implementation date now supposedly set in stone, those planning to carry on need to work out how best to organise themselves and establish internal processes to achieve compliance.

Data and data management sit at the core of the challenge: FRTB presents market participants with a number of organisational, computational and granularity challenges with respect to the data they need to support their compliance objectives. These objectives necessarily involve the reorganisation of trading book operations, upgrades to technology platforms and improved procedures around data governance, all to ensure the correct split between trading and banking books and the production of timely market and reference information to support the decisions around the use of models, as outlined by regulators.

Failure to address the way they use their internal models, and streamline processes to measure, attribute and capitalise traded risk, will lead to product offerings becoming unprofitable and the risk of regulatory censure. As such, firms need to look now at how to source and manage the data – both internal and external – needed to comply. Specifically, they need to review their processes surrounding data sourcing, governance and timelines, as well as data infrastructure, risk data aggregation and risk reporting.

TIMELINES

Basel 1 introduced, including the capital requirements for market risk and introducing a standardised and internal models approach.	**1996**	
	2004	Basel II introduced, including updates to the trading book regime.
Basel 2.5 introduced, including attempts to update trading book regime weaknesses as revealed by the financial crisis of 2008-09, and incorporating further updates to the market risk framework.	**2009**	
	2011	Basel 2.5 implemented on December 31st.
Initial consultation paper on the Fundamental Review of the Trading Book (FRTB) initiated by the Basel Committee on Banking Supervision (BCBS) under the Bank of International Settlements (BIS).	**MAY 2012**	
	OCTOBER 2013	Second consultation paper published by BCBS, setting out a draft text for a revised market risk framework.
Annex to second consultation paper published by BCBS.	**MARCH 2014**	
	APRIL 2014	First Quantitative Impact Study (QIS) on FRTB.
Second QIS.	**JULY 2014**	
Third QIS.	**DECEMBER 2014**	Third consultation paper published by BCBS, outlining a limited set of new revisions to the proposed market risk framework including treatment of internal risk transfers; a revised standardised approach; and a simplified method for incorporating the treatment of liquidity horizons into the internal models approach (IMA).
	NOVEMBER 2015	Fourth QIS.
Publication by BCBS of revised standards for minimum capital requirements for market risk (FRTB), scheduled to be implemented as final rules under domestic legislation on 1 January 2019, with regulatory reporting under the framework becoming a requirement from December 31st 2019.	**JANUARY 2016**	
	NOVEMBER 2016	Publication of the EU's Revised Capital Requirements Regulation (CRR II), including FRTB.
Release of consultative document by BCBS on a 'simplified alternative to the standardised approach' for market risk.	**JUNE 2017**	
	DECEMBER 2017	Final regulatory standards for Basel III published by BCBS. Announcement of a revised implementation date for FRTB standards, pushing deadline back to 2022.
Release of new consultative document from BCBS on 'revisions to the minimum capital requirements for market risk', primarily aimed at addressing industry concerns arising from the January 2016 published framework and including modifications to IMA P&L attribution test, updates to IMA process for non-modellable risk factors, revisons and clarifications on banking book boundary, revision of trading desk definition and proposal for a simplified standardised approach to benefit smaller banks (response deadline: June 2018).	**MARCH 2018**	
	SEPTEMBER 2018	Publication by European Central Bank (ECB) of three risk-type-specific chapters of its guide to internal models for consultation (covering credit risk, market risk and. Counterparty credit risk), intended to ensure a common and consistent approach to IMA regulation for banks under ECB supervision (consultation ended November 7th 2018).
Announcement from BCBS revising the Minimum Capital Requirements for Market Risk Standard to address issues raised in the March 2018 consultative document, with a new deadline of January 2022.	**JANUARY 2019**	
	JANUARY 2022	Current expected EU FRTB go-live date (as part of CRR II implementation). Banks must also conduct the new P&L attribution (PLA) test from 1 January 2022.
Pillar 1 capital requirement consequences of assignment to the PLA test amber zone or PLA test red zone will apply beginning 1 January 2023.	**JANUARY 2023**	
	2027	End of five-year phase-in period for Basel IV "output floor" (a floor for capital requirements calculated under internal models, starting at 50% of standardised capital requirements in 2022 and increasing by 5% each year until 2026, going up to a final 72.5% in 2027).

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PRINCIPLES AND KEY REQUIREMENTS

By tightening the rules around what qualifies as trading book vs. banking investment book holdings – which each attract different capital adequacy reserve calculations - FRTB aims to restrict firms' ability to move assets between the two in order to optimise their capital availability.

At the same time, FRTB will impose measures designed to construct a more realistic view of risk, including greater trading book risk diversification and a more stringent approach to liquidity horizons.

All told, these requirements aim to establish that firms' capital adequacy calculations are grounded in reality, ensuring they make appropriate provisions for potentially damaging market events.

Among the key provisions with the most profound impact on how firms source and manage data are:

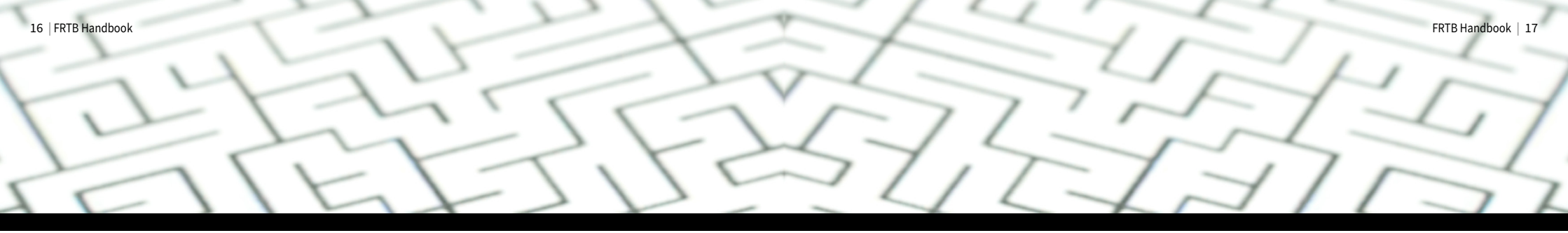
Trading book boundary changes

Current rules encourage firms to in effect arbitrage between their trading and investment books. Firms buying an asset for trading purposes are encouraged to transfer that asset to their banking books in order to take advantage of lower capital cover requirements.

By pushing non-performing trading assets to the investment book, firms reduce the amount of capital cover they need to provide to 1.6% from 8%. This represents an incentive for firms to shift non-performing trading assets to the banking book, reducing the cover they have in place by 80% with the obvious increase in exposure for may be the most risky assets they hold.

FRTB addresses this issue by recasting the rules governing which assets qualify for inclusion in the trading and banking books. FRTB will require firms to seek regulatory approval to change the designation of assets from trading book to banking book. In particular, this is expected to impact the practice of securitisation of poorly performing assets into a more credit-worthy derivative before transferring the security to the banking book.

In this way, FRTB firms up the boundary between banking and trading



books, while imposing strict requirements for governing the migration of positions, thereby restricting the inappropriate release of regulatory capital.

New emphasis on standard risk models

FRTB introduces greater emphasis on the use of standard risk models to govern market participants capital adequacy calculations. Under current rules, firms are able to apply proprietary models to measure their risk levels, as long as these are approved by supervisory bodies.

For specific, potentially higher-risk activities, firms may be required to use standardised models to ensure they are adequately provisioned to cope with a loss. The proprietary models – preferred by larger, more complex financial institutions – are more attractive because they invite lower capital reserve provisions, freeing up bank funds for more profitable endeavours.

FRTB will encourage the use of a standardised approach that would see banks adopting pre-approved models for their capital adequacy calculations. This aims to address inconsistencies across different market practitioners in the way they viewed risk, making it difficult for supervisory bodies to assess overall risk exposures and impose the appropriate level of capital to cope with times of stress – considered by regulators to be a contributory factor in the Credit Crisis of 2008.

FRTB will require approval of firms' proprietary models on a trading book basis rather than by institution. This presents a significant challenge since even mid-tier firms may operate hundreds of trading books (Tier 1 banks may operate more than a thousand), introducing a significant data and infrastructural challenge to achieve compliance: FRTB requires firms to adequate internal controls for each trading book, requiring them to put in place a management structure to oversee the activities of each.

To reduce the reliance on internal models, FRTB introduces a standardised Sensitivity-Based Approach (SBA) that provides a conservative floor for trading desks that are taking a proprietary Internal Models Approach (IMA).

SBA also provides a credible alternative to IMA for those desks that are unlikely to obtain regulatory approval.

The expectation is that firms will demur from efforts to use proprietary models in the face of too much work and cost to secure the necessary approvals, placing greater emphasis on the standardised approach.

Those taking the IMA route will need to get approval for individual trading books, with each desk needing to demonstrate it can control the data that drives its internal model as well as understand how the output can be used for risk management.

To enforce this, FRTB outlines a series of model performance tests to ensure that there is sufficient granularity in the outputs from the trading analytics that are fed into the capital model. These include the granularity of sensitivities to the risk factors that drive the valuation of instruments and within the Expected Shortfall (ES) simulation, allowing daily P&L prediction.

The P&L eligibility tests will be monitored continuously; failure to pass the tests will lead to the rescinding of approval, with the desk falling back onto SBA. Faced with this prospect – and the cost of attempting to avoid it – is pushing many particularly smaller to abandon internal model approval and focus on adapting their current Value-at- Risk (VaR) model to calculate SBA.

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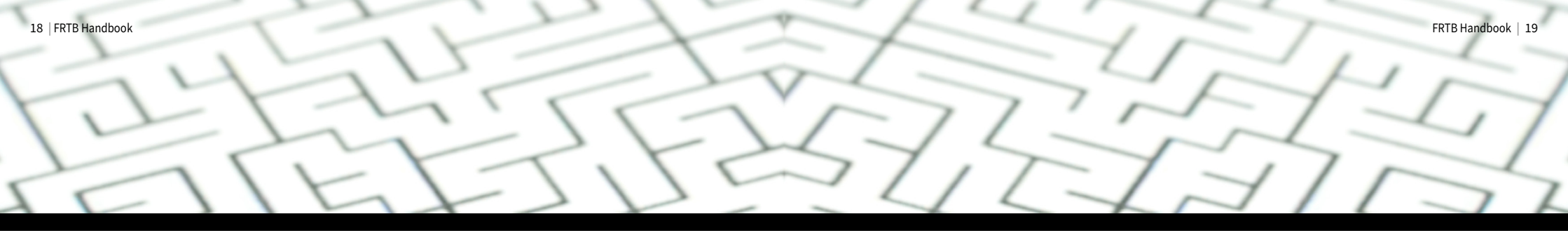

New liquidity risk horizon schedule

FRTB introduces the requirement to set specific liquidity targets for each risk position. Current rules provide for a standard 10-day window for the mark-off of all positions in the trading book, and firms typically use a 10-day VaR calculation to meet the risk measurement obligation. The new requirement recognises that this 10-day window is unrealistic, and will require liquidity windows to be set on a per-asset basis with windows expected to stretch to 20 or 30 days and beyond.

In terms of requirement, this change introduces an additional level of complexity, with firms forced to assign each holding its own liquidity horizon. This makes measurement of how any position impacts the overall risk of the trading book more onerous. To address the requirement, firms are expected to shift from VaR to the Expected Shortfall calculation as their approach to assessing trading book risk, resulting in an overall higher level of capital requirement.

Portfolio risk diversification

During the Credit Crisis, instruments behaved in a more correlated way than in usual market conditions. This indicated that existing measures of risk were insufficiently granular to differentiate between different components of the portfolio.

Under current rules, all component assets in a portfolio are treated the same way from a risk perspective. There is no provision for diversification of risk within the portfolio. As a result, firms are able to use hedging techniques between different assets within the portfolio to demonstrate lower overall risk and qualify for lower capital coverage. While this may be effective under normal circumstances, it was found wanting by the conditions experienced during the Credit Crunch.

Based on the assumption that diversification is positive for any portfolio from a risk perspective, FRTB will introduce a diversification calculation that assigns a level of risk to any hedged position. Moreover, any change to a hedged position will result in changes to the level of diversification within the trading book, which in turn will impact the required capital coverage.

As a result, firms will need to understand better their holdings and their classifications, and what impact any transaction will have on the overall diversification of the trading book.

Implications for data and data management

Getting and retaining model approval will be an organizational and data challenge for those taking the IMA route. Each desk will need to deal with definitional and categorization issues with respect to product class, region and legal entity of issuer and counterparty.

FRTB will require firms to improve the quality of the historical data that drives their capital calculation and introduces tests that firms have to pass in order to declare risk factors as 'modellable'. For non-modellable risk factors (NMRFs), firms will need to calculate an additional capital charge with zero diversification benefits. As a result, NMRFs, expand the number risk factors that were previously highlighted as outside of the VaR calculation (risk not in VaR or RNIV), extending the need for data capture and analysis.

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FRTB: THE DATA ISSUES

For most financial institutions, FTBR will make trading book operations more complex. Industry consultations have indicated concerns around key aspects affecting trading book operations, and many of these have implications relating to data collection and quality. This points to the need for data in specific areas to underpin the new environment:

Real price observation data

Firms seeking to use internal models under the new IMA regime will need access to accurate observation data consisting of real price information for transactions in securities and derivatives held in their trading book.

Under FRTB, firms must produce at least 24 observations of executed prices (or committed quotes) per year at the risk factor level. This poses particular challenges for OTC securities and derivatives, which often trade less frequently than listed securities and derivatives.

The fragmented nature of liquidity across OTC markets and geographical centres means that external data can often be fragmented. This poses challenges for banks, requiring them to aggregate multiple sources of external information into a consistent data model, often augmenting external sources with internal ones. To address this, firms may need to secure multiple sources of data in order to secure the number and quality of observations required.

Once the observable prices have been sourced, firms need to demonstrate whether the risk factors involved were modellable. Following the identification and resolution of instances of duplication of real prices across two or more sources the derived (bank internal) risk factors will need to be linked to external (market-based) instrument identifiers.

Individual banks' approach to this will vary depending on size and sophistication of the institution. Firms may or may not be able support a flexible approach to risk factor definition, where risk factors are based on curve/surface definitions that can be recognised by the bank's market data system. Larger firms tend to be more sensitive to risk definitions and have

more expertise in handling large quantities of data, making it more likely that they will handle this function themselves. In this case, they may seek to link external price feeds to their internally defined lists of risk factors impacting internal positions.

Instrument classifications

Firms will need reference data to identify and classify the instruments they hold in order to understand the nature of the instrument in question. To get this allocation right first time, they will need access to instrument identification and terms and conditions data covering the issues in question. Although firms may have access to much of this data through their usual business operations, their data sets are likely to be incomplete and validation processes inadequate to meet the demands of the new rules.

Broader data sourcing

To meet the data requirements of the new rules, firms will need to address gaps in their data sets. This may involve sourcing data from external providers that can offer not only comprehensive price histories but more specialist information like corporate credit data to monitor default risk changes, instrument identifiers and credit ratings for issuers.

The risk profiles of each trading book need to be rolled up through each desk hierarchy in order to gain a view of consolidated risk across trading operations. This necessarily entails drawing upon repositories of product and security master data, as well as issuer and risk data.

DATA MANAGEMENT IMPACT

FRTB poses challenges not only about the availability of data but also for ensuring the right data is available to the right applications in the correct format and at the right time. As such, managing the data is as important for regulated entities as the data itself. FRTB poses data management challenges across a number of processes:

Trading book qualification assessment

Regulated firms will need approval for moving their holdings from one book to the other. This places more emphasis on getting their original designation right in the first place. Distributing new business between trading and banking books requires a comprehensive audit trail capability, since all new trading book business will impact the risk profile of the overall business.

To measure that impact, firms need to understand the component risk elements on a historical basis, a requirement that also applies to the new portfolio risk diversification requirement. Any audit trail capability needs to take into account the volume of trades and the number of books involved, so that compliance staff can build risk profiles as needed.

Firms will need to show evidence of strong management structures governing holdings in these respective books. Firms will want to get the transfer right first time, as they will need to evidence that the capital calculation does not drop during transition. Firms will need to retain details of analysis calculations, challenges from independent groups, signoff and ongoing capital measurement.

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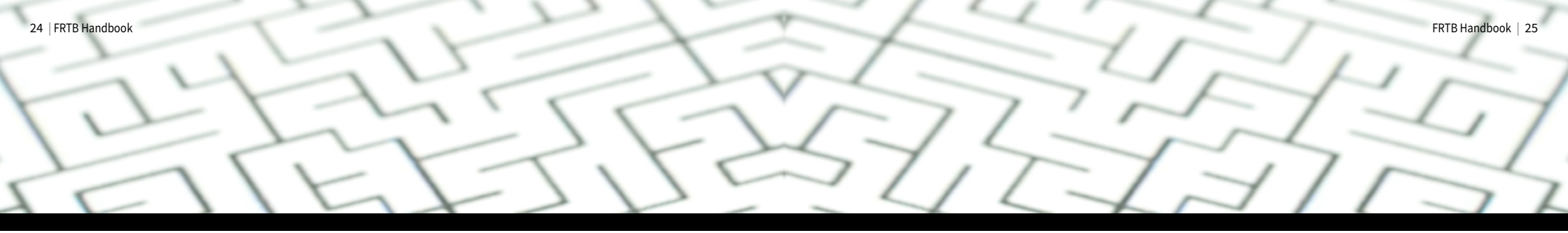

Daily regulatory capital calculations

The adoption by firms of the Expected Shortfall (ES) calculation in place of Value at as the basis of the regulatory capital calculation poses a number of data challenges. For one thing, the computational requirement for making this change is substantial, necessitating as it does stress-testing by asset class, greatly increasing the need for modelling. Further, back-testing in this environment is not well established, and banks may struggle to master it. Finally, these factors will have a major impact on the technology infrastructure needed to ensure the right data is being applied correctly to the right models.

FRTB places additional demands in terms of the quantity and quality of market data required to drive the ES calculation. Firms will need access to 10-plus years of data covering instruments prices and the risk factors that drive pricing of more complex products such as options. Firms will also require a similar span of time-series data to support their default risk charge calculations.

Many banks are finding that their existing stores of data don't go back far enough. To date, firms haven't been required to look back this far, and it's often the case that older data sets aren't as rich as stipulated by regulators. Many historical data stores have gaps or bad data, in terms of zeros, unintelligible numbers and other errors. The quality of the time-series is affected by risk factor information that is updated infrequently as the ES is expected to be a calculation of daily P&L.

Emphasis on standard models

FRTB introduces a more valuations-based assessment of portfolio risk. The residual risk contained within a firm's trading book will rely in part on the valuation of its holdings, which will require a documented pricing model for all assets in the book.

Financial institutions will be required to publish the results of their standard-model calculations for assessment by regulators and others. This will require them to put in place a model-management infrastructure to handle inputs into and outputs from standard models, creating the need for sophisticated tools for modelling market risk. This infrastructure must be cheap and easy to maintain, because the flat capital reduction from standard models means there is no capital upside for banks that use them.

Multiple liquidity risk horizons

Managing portfolios with multiple liquidity risk horizons poses logistical challenges. The multiple calculations required are difficult both computationally and due to the lack of data to input. It's also hard to maintain consistency across these multiple liquidity horizons.

Trading book risk diversification

Practitioners will need to calculate risk levels in a diversified / hedged portfolio, creating the need for a flexible engine for on-demand risk calculation. One complication here is that the calculation won't be a pure risk calculation, but will have to take into account regulatory requirements to meet the legal obligations. Some banks are considering whether this will require the establishment of an independent internal risk control unit that operates outside of the risk and trading functions and uses its own models and risk calculation infrastructure.

Any new system needs to be able to handle the scale and new complexity of the trading book and any associated banking book. It won't be acceptable to split a regulated position between the two books. The system must also be able to assign a risk value to a hedged position, and in the context of the diversification profile of the portfolio.

Finally, FRTB will require a more proactive management of market risk collateral and a regulatory reporting platform robust enough to handle the granularity and demanding timeframes of the new rules.

This aspect of FRTB has specific data challenges, both in terms of underlying data sets required to classify holdings or run risk or capital

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calculations, and new risk factors regulators will now require firms to take account of. In most instances, firms will be required to source these data sets internally and externally, and to implement data management structures to normalise, integrate and choreograph the disparate data sources required for compliance.

Firms will need to be able to calculate risk-derived P&Ls for each book, allowing the risk function to calculate adequate capital coverage using standard models. The finance function, meanwhile, needs complete P&Ls for publication to requisite regulators. While the former has historically been something of an approximation, under FRTB these two calculations need to be closer than before. Hence, firms need to pay close attention to their ability to calculate risk-derived P&L on a book-by-book basis, drawing on credit risk factors, internal and market pricing, and valuations data for illiquid holdings where necessary.

FRTB applies a modellability test on each risk factor based on the amount and frequency of observed trades executed or 'real' quotes. This requires considerable effort in monitoring/storing of trades executed at the instrument level and then using the data to evidence the modellability of the relevant risk factors. To nullify this risk, firms will need to validate their time-series data, filling the gaps in their data sets with proxies where necessary. This can be difficult to achieve 10 years out, where major/key price movements may be the only available proxies for real market data.

Enhanced standardised model

Firms will need to implement the newly enhanced standardised model – SBA – for all trading books. SBA calculations provides a level playing field for regulators to monitor risk activity across the firms under their jurisdiction without being subject to the vagaries of different internal models. SBA will also act as a backstop for desks falling out of IMA and also a floor for those with approval. For desks with an existing VaR-based internal model, much of the sensitivities will be available with a manageable increase in reference data tagging. For smaller banks with a current basic IMA, the effort to comply with the enhanced model will be considerable.

From an IT perspective, this will require bank's risk systems to be integrated with a risk factor modellability tool. From the perspective of compliance and regulatory review, risk managers will require that risk factor modellability calculations are auditable and it is likely they will need dedicated user interfaces to manage this.

Because the IMA status of each desk will be under constant review, banks will also require a reporting capability that allows complete overview of risk factor modellability status and governance. Early warning alerts for modellable risk factors that are close to becoming non-modellable will generate watch lists that give desk heads time to take remedial action that will retain IMA. Optimising risk factor modellability is set to become a competitive differentiator.

Pulling together both internal and external data in order to prove to regulators that trading prices were 'real' is one of the most complex elements of FRTB. Linking real prices from multiple sources to common instrument identifiers is one such challenge. Also the data management capability needs to be able to map closely matching real prices to common instrument identifiers.

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PRACTITIONER APPROACHES

The marketplace is likely to see a parallel operation of both internal and standardised models for risk calculation among many Tier 1 institutions. Infrastructure will play an important role in ensuring compliance with the eventual regulation, whether or not the bank decides it needs to establish an independent risk control unit to meet the new requirements.

To ensure they are optimising their use of capital under the new rules, banks will need to identify all asset classes and trading desks that contribute to the capital charge. All affected portfolios need to be analysed and optimised according to capital parameters. All of these changes will require a consistent underlying data and IT structure to support this ongoing requirement. Banks will need to work with technology and implementation partners that have the required expertise as well as their systems knowhow. And this needs to be achieved at a reasonable cost.

For firms that are reluctant to give up their internal models, FRTB presents a number of data sourcing and data management challenges as firms seek to plug gaps in their data stores with externally supplied pricing, valuations and identifier data. External data can augment basic reference data, particularly instrument data, with high-quality data and ensure its accuracy on an ongoing basis, thus helping firms develop a single data set to support FRTB requirements.

As mentioned above, time-series data is a data challenge of FRTB as data covering risk factors used in risk calculations must be stored for 10 years. Firms will need to collaborate with external data providers to close the gaps in their data and avoid extensive use of proxies.

Real market price data is needed to assess whether risk factors are modellable requires a pragmatic approach as trade data has never previously been collected and used in this way. While sourcing trade data on instruments that are priced using model with risk factors as inputs is a new issue, the traditional challenge of integrating all required data still remains. De-duping and combining data from multiple external and internal sources to create a consistent data framework is a challenge, and one that is often best met by third-party data providers.

The internal data management issues of FRTB are no less taxing, but can be addressed by centralising instrument and counterparty data. Best practice here is to establish a central repository of static instrument data that includes attributes and lineage, and can be used as a base for several FRTB functions.

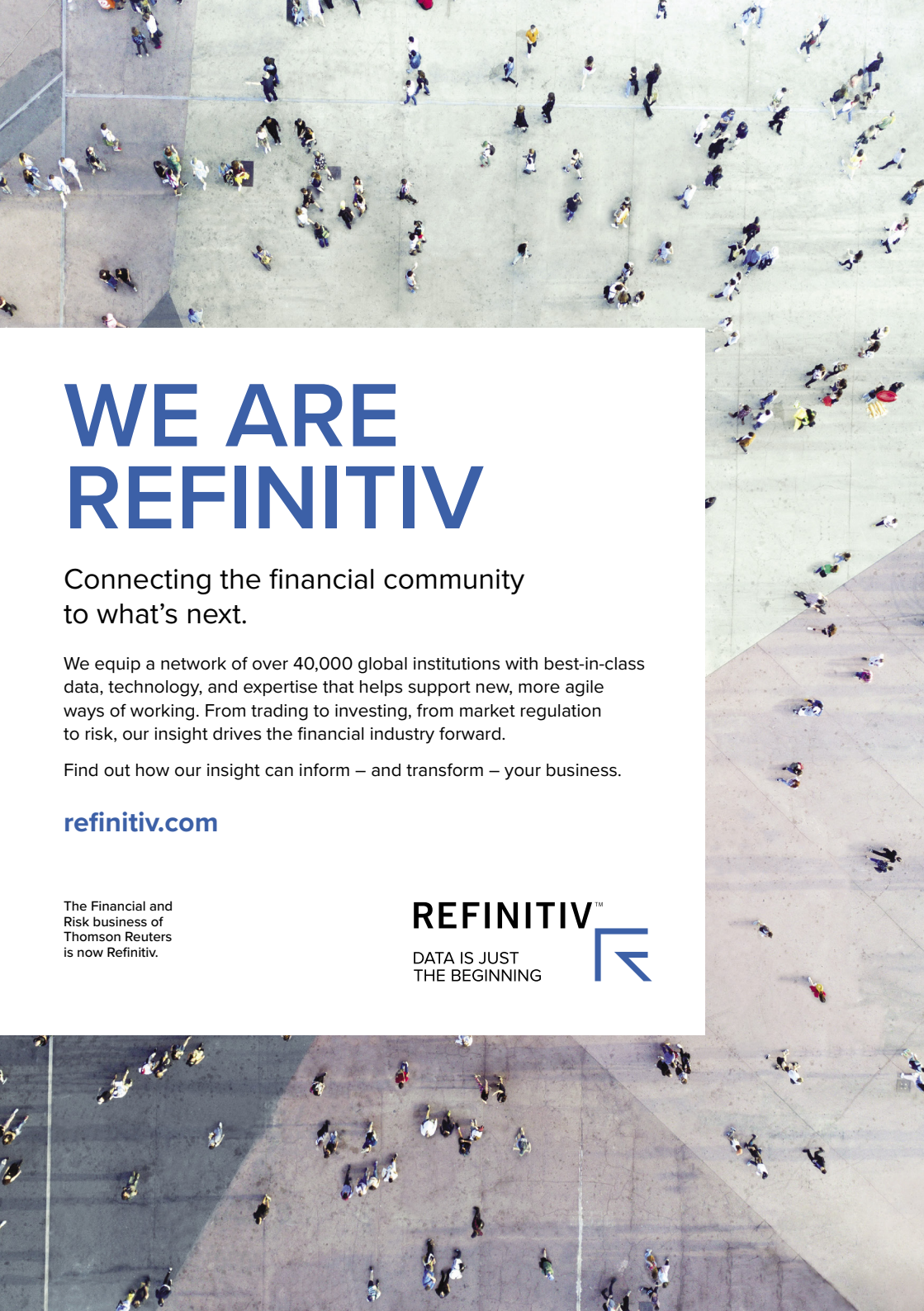
Full lineage risk factor data used in the ES calculation together with their linkage to instrument trade data and quote observations is essential to gaining regulatory approval for an internal model approach to the calculation of portfolio risk.

Firms can follow similar principles to create a static database of issuer data that includes identifiers and access to ratings data. While the challenge isn't as great as for instrument data, getting issuer static data right is critical as it fulfils the need to address FRTB's default risk calculation requirements.

Finally, firms are taking a mix of approaches with respect to time-series data cleansing, a significant challenge of FRTB given the historical data requirement. Some banks are addressing this by taking a generic proxying approach using a risk factor with similar characteristics and high therefore high correlation with the target security. Meanwhile, others are taking a segment-based approach, which may involve backfilling missing data with entire data sets (for example, an entire year of time series) rather than on an idiosyncratic risk factor basis.

So far, according to statements by regulators, banks have succeeded in addressing the data challenges in certain areas, like the Expected Shortfall calculation and Standard models, but continue to struggle in other areas like non-modellable factors.

Regulators will be reviewing the situation as they assess firms' documented approaches to these and other FRTB data challenges. In each this and across the key element is ensuring proper governance and documenting it appropriately. Regulators will be looking for process, methodology and evidence of governance, which is aimed at minimising flaws in the data.



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