

FRTB

Special report 2019

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The light at the end of the tunnel

Light is beginning to emerge at the end of the tunnel for the Basel Committee on Banking Supervision's Fundamental Review of the Trading Book (FRTB).

The first iteration of the revised framework was published in January 2016, with an implementation date of January 2019. However, that go-live date was pushed back to the start of 2022 on completion of the Basel III reforms.

With industry concerns brewing, the Basel Committee issued a consultation with proposed improvements to the framework, before publishing a final version on January 14.¹

The changes will likely bring consequences, say market participants. The updated framework reinforces the divide between trading and banking books, shakes up the approval process for the internal models approach (IMA) and provides a more risk-sensitive standardised approach (SA).

Banks say the revisions make the IMA relatively more attractive than the SA – a reversal from the original version of the rules, which were tougher on in-house approaches.

For example, the 2019 revisions also create paths to reduce the number of costly non-modellable risk factors for banks using the IMA. The changes have made IMAs more popular on foreign exchange desks, where banks in Singapore are eyeing internal methods to reduce the capital impact.

Forex risk under the 2016 FRTB-SA rules was projected to be 120% greater than the IMA. Under the 2019 rules, this has increased to 220% – perhaps part of the reason banks are increasingly considering the IMA.

Despite this, the costs associated with implementing the IMA are high and it is a complex process. For banks wishing to use their own models to calculate capital requirements, the framework will be complex and expensive to implement, which could ultimately threaten the viability of certain business lines.

Concerns centre around such businesses as correlation trading, which may need to rethink hedging methods or close down the business altogether. Some fund-linked trades are also at risk, with some banks having stopped offering products that expire after 2023, when the new Basel Committee rules on market risk are expected to come into force in the European Union, while some are charging more for them.

It has been said restoration of risk weights for equity risk factors, with an increase of 30–60%, impacts not only cash equity trading, but all structured products linked to investment funds.

Implementation is now up to local regulators, with all eyes on the US Federal Reserve, the UK's Prudential Regulation Authority, the European Banking Authority and Japan's Financial Services Agency.

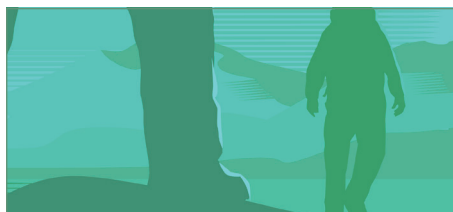
Much time and effort was originally focused on meeting the 2019 deadline that never came to pass for the 2016 version of FRTB, so banks are waiting for their respective local regulators to weigh in before taking the plunge again.

European lawmakers decided in December to put the reporting requirements into effect before the capital requirements, with reporting under the SA to begin in December 2020. UK progress very much depends on the outcome of Brexit, while in the US, Fed officials have said they would like to get rules bottomed out this year.

Strategic decisions over the best way to implement the new revisions will still be required in advance of 2022, and the industry will watch attentively as banks go about making adjustments to their original implementations.

Even with a two-and-a-half-year window, a year is likely needed for model approval, and up to another before that for parallel runs, making 2019 the year for banks to decide how they will implement FRTB.

¹ Bank for International Settlements, Basel Committee on Banking Supervision, Explanatory note on the minimum capital requirements for market risk, January 2019, <https://bit.ly/2Yds6Qk>



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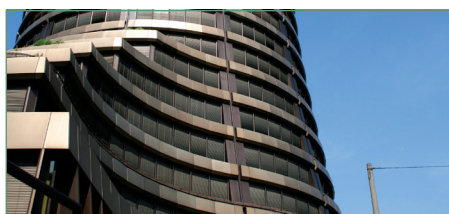
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2022 – A market risk odyssey

Though January's final version of FRTB offered no great surprises to those who have followed the regulation since its inception, banks now have a greater idea of what is required of them. **Bloomberg** explores the importance for banks to have FRTB infrastructure in place and models approved by supervisors in time for the deadline

A great way to stake a claim on the future is to lead with a date: think *1984* or *2001: A Space Odyssey*. The January 2019 edition of the Basel Committee on Banking Supervision's Document 457, *Minimum capital requirements for market risk*,¹ leads with a date in the very first sentence: "This document sets out the amended minimum capital requirements for market risk that will serve as the Pillar 1 minimum capital requirement as of 1 January 2022, replacing the current minimum capital requirements for market risk as set out in Basel II and its subsequent amendments."

What follows is the final version of FRTB, and while the Basel Committee is less famous as a futurologist than George Orwell, Arthur C Clarke and Stanley Kubrick, emphasising the go-live date after years of delays reinforces regulators' commitment to timely adoption of the new standard.

For those who followed the rule through the initial draft (2016²), two sets of frequently asked questions (2017³/2018⁴) and a consultation document (2018⁵), January's final version offered no major surprises. A mild shake-up in the standardised approach (SA) is a lighter look-through requirement for index exposures. For indexes and their derivatives, the initial draft mandated looking through to constituents for both the sensitivities-based method (SBM) and the default risk charge (DRC). The final rule lets banks calculate the SBM for common well-diversified indexes without looking through to constituents, using new equity and credit index buckets. However, the rule states that it is possible to look through to constituents and still requires look-through for the DRC to enable bucketing by credit rating.

Consequently, banks still need constituent data and ratings for index exposures even if they skip calculating constituent-level sensitivities.

Name	Wgt	Pos	Local Yield	Local Yield to Mat	Local Mod	OAD
(LF98TRUU) Bloomberg Barclays US Corporate High Yiel..	100.00		6.04	6.47	3.45	3.27
BBB	0.05		4.07	4.07	4.89	4.93
COSCN 4 3/4 04/01/22	0.02	182,359.00	3.44	3.44	2.58	2.58
COSCN 6 04/01/42	0.01	151,977.00	5.77	5.77	12.33	12.49
COSCN 7.9 09/01/21	0.02	219,825.00	3.48	3.48	1.97	1.97
BBB-	0.55		4.24	4.31	4.91	5.03
BACR 4 3/4 09/11/24	0.10	1,250,000.00	4.02	4.02	4.59	4.59
BACR 4.836 05/09/28	0.16	2,000,000.00	4.72	4.74	6.47	6.84
BACR 5.2 05/12/26	0.17	2,050,000.00	4.56	4.56	5.75	5.75
GPS 5.95 04/12/21	0.11	1,250,000.00	3.20	3.56	1.48	1.49
BB	46.74		4.47	4.91	3.69	3.56
BB+	11.09		4.45	4.71	4.38	4.28
AA 6 3/4 09/30/24	0.06	750,000.00	5.12	5.67	2.89	1.38
AA 6 3/4 05/15/28	0.04	500,000.00	5.58	5.68	5.57	5.19
AA 7 09/30/26	0.04	500,000.00	5.26	5.84	2.07	3.06
AEL 5 06/15/27	0.04	500,000.00	4.70	4.71	6.37	6.47
AES 4 03/15/21	0.04	500,000.00	3.36	3.36	1.65	1.65
AES 4 3/4 03/15/23	0.04	500,000.00	3.63	3.85	2.53	1.71

Index constituents bucketed by rating

Beyond look-through and some changes to SA risk weights, the final rule largely confirms the changes proposed in the 2018 consultation document, while revising the internal models approach (IMA) based on industry concerns. Those changes fall into two categories: modellability and profit-and-loss attribution.

Modellability

Responding to concerns around seasonality and new issues, the final rule makes it easier to show enough 'real' price observations – trades and/or committed quotes – to pass the risk factor eligibility test (RFET) for modellability. Factors with month-long gaps between observations can be modellable if they have at least four price observations per quarter and 24 total observations in the past year. In addition, factors become modellable after 100 observations, even before accumulating a year of history.

Bloomberg analysed the impact of the changes, concluding that:

- The '4 in 90' rule – a minimum of four observations in any 90 day period – increases the number of bonds and factors that pass the RFET noticeably
- Admitting factors with at least 100 observations helps only marginally
- Including committed quotes makes a big difference for many risk factors.

Profit-and-loss attribution

Banks liked the traffic-light approach in the 2018 consultation, but feared the amber and red zones would be triggered too frequently. The final rule has wider green and amber zones, especially for the Kolmogorov-Smirnov test.⁶ It also maintains a capital surcharge – effectively interpolating between SA and IMA capital – for desks in the amber zone.

Along with the amber-zone capital surcharge, the IMA and SA are also related through the capital floor. The original rule established that a fractional multiple of SA capital should act as a floor for total capital. While floors are not mentioned explicitly in the final rule, the concept remains, limiting the capital relief coming from IMA. Banks will therefore need to weigh potential capital relief coming from IMA against implementation costs.

This brings us back to 2022, but also to 2019. Regardless of whether 2022 is a deadline for reporting only or full capital implementation, banks must have FRTB infrastructure in place and models approved by supervisors by then. With a year likely needed for model approval, and up to another before that for parallel runs, 2019 is the year for banks to decide how they will implement FRTB. ■

Learn more

Visit www.bloomberg.com/FRTB

¹ Bank for International Settlements (BIS), Basel Committee on Banking Supervision (BCBS), Minimum capital requirements for market risk, January 2019, <https://bit.ly/2UJ3DeV>

² BIS, BCBS, Minimum capital requirements for market risk, January 2016, <https://bit.ly/2XuSSkR>

³ BIS, BCBS, Frequently asked questions on market risk capital requirements, January 2017, <https://bit.ly/2XvOp1x>

⁴ BIS, BCBS, Frequently asked questions on market risk capital requirements, March 2018, <https://bit.ly/2CLN8H6>

⁵ BIS, BCBS, Revisions to the minimum capital requirements for market risk, March 2018, <https://bit.ly/2xaOeSD>

⁶ SPSS Tutorials, SPSS Kolmogorov-Smirnov test for normality, <https://bit.ly/2xl2XT7>

Singapore's banks eye internal models for forex desks

New market risk regime dangles capital savings for own-models approach. By Aileen Chuang

Singapore's largest lenders are looking at using their own models to calculate capital for foreign exchange trading desks, after recent changes to market risk rules alleviated concerns among Asia's banks over the uncertain capital impact of the new regime. However, adoption of the internal models approach (IMA) will not be straightforward, banks warn.

"We are going for IMA," says Chew Chee Keong, UOB's managing director for market risk. "We can save capital if we go with IMA for our forex trading desks."

UOB estimates that shifting to internal models could reduce the bank's market risk capital requirements by up to one-third compared with staying on the regulator-set standardised approach (SA).

When the original FRTB was released in 2016, Asian dealers said the framework would hike capital requirements for less liquid markets such as theirs, largely because the data threshold for internally modelling risk factors was too high. Banks in other regional markets, such as South Africa, echoed these fears.

Even large US lenders had initial reservations about the IMA, with Wells Fargo committing to using the SA.

Global standard-setters tweaked the framework in January to soften the rules around the observability of hard-to-model risk factors, which is a particular problem for less liquid markets in Asia-Pacific. The revised FRTB offers banks fresh incentives to push for internal models on certain product lines, and may prompt some Singapore banks to extend their use to interest rate derivatives.



"For the markets side, we are exploring and assessing IMA for forex and linear interest rates desks," says OCBC's head of global treasury business management, Frederick Shen.

Singapore's largest lender, DBS, is more equivocal. Brian Lo, group head of market and liquidity risk at DBS, says the bank is "not ruling out" pursuing the IMA on a desk-by-desk basis.

Forex trading accounts for the largest portion of the derivatives book among Singapore's banks. The city-state is the largest forex centre in Asia-Pacific, with average daily market turnover of \$517 billion, third behind the UK and the US, according to the Bank for International Settlements' Triennial Survey in 2016 (see figure 1).¹

Singapore's banks are planning to use the IMA for their structural forex hedging. This type of exposure arises from forex fluctuations between a bank's reporting currency and its holdings in subsidiaries operating in different jurisdictions. The risk sits in dealers' banking books, as opposed to their trading books – but under FRTB, instruments that carry forex risk are subject to market risk capital requirements regardless of whether they are held in the trading book or banking book.

DBS reported a total of S\$18.2 billion (US\$13.5 billion) in structural currency exposures in the year to December 2017, while OCBC had S\$20.7 billion and UOB's stood at S\$12.9 billion, according to their 2017 annual reports, the most recently available.^{2,3} The unhedged positions stood at S\$5.8 billion for DBS, S\$14.7 billion for OCBC and S\$9.6 billion for UOB. The lenders are yet to release their 2018 annual reports.

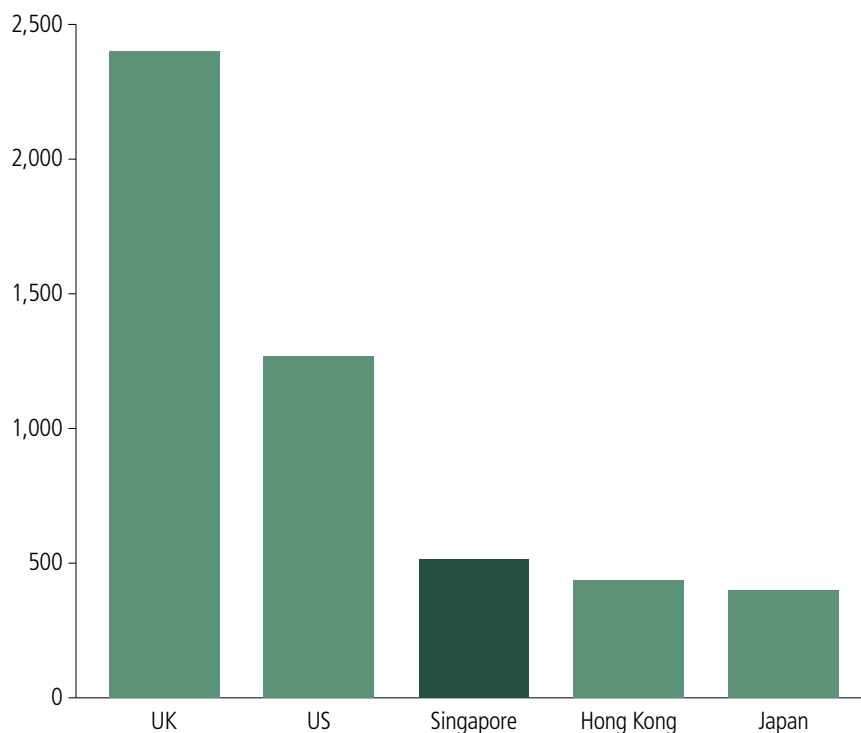
Typically, banks use forex derivatives to hedge this structural forex risk. The hedging activity benefits from exemptions from market risk capital requirements – but banks must first seek their host regulator's approval and meet certain conditions.

More broadly, any Singapore bank intending to use the IMA will need to gain approval from the Monetary Authority of Singapore (MAS) and, for the first few years at least, benchmark its IMA results against the standardised model. Banks are expecting to learn details from the MAS on the city-state's plans for FRTB and guidelines to define their trading desk structure.

The most capital-efficient structure for large banks, believes KokWah Lok, head of market risk client services for Asia-Pacific at tech vendor Murex, is to seek the IMA across all forex trading desks.

"It may not make sense to split forex cash positions from the vanilla and exotic options desks," he says. "Banks trade complex structures and then hedge them with spot and vanilla products. So if you split them into one desk governed under IMA and the other under the SA, you don't get the hedging

1. Forex turnover by country (billions of US dollars)



NB Data shows average daily turnover of over-the-counter forex instruments
Source: BIS Triennial Survey 2016

benefits any more, because you will set aside capital at different levels and without offsets."

The price is right

The January revisions to FRTB are intended to help banks meet modelling thresholds in less liquid markets. The criteria for risk factors to qualify as modellable have been relaxed to permit four price observations in 90 days, or 100 observations in the previous 12 months. The 2016 version of FRTB permitted a maximum 30-day gap between observations for a risk factor to be deemed modellable. For products that trade on a seasonal basis, such as agricultural commodities, the new rules will aid banks hoping for IMA approval.

Singapore's banks have an improved chance of meeting the IMA threshold for their forex desks because they have the historical data on prices and quotes, dealers say.

The January framework has also expanded the number of currency pairs that enjoy lower risk weights. Banks may now calculate forex risk in a currency pair by nominating a base currency, instead of the reporting currency. The revised approach enables banks to apply a lower risk weight to currency pairs that are triangulated from other, liquid currency pairs.

For example, a Singapore bank trading a liquid

currency pair involving the US dollar and an emerging market currency should not then have to calculate the risk of the emerging market currency against their reporting currency – the Singapore dollar – because the dollar/Singapore dollar rate is highly liquid.

However, banks warn that hurdles remain. Liquidity in some Asia-Pacific markets is variable, which leaves trading desks susceptible to falling in and out of IMA approval as markets wane in liquidity.

"People need to assess how volatile IMA qualification would stay for a particular desk, especially when they are confronted by a significant number of risk factors that might get trapped in the non-modellable category, on and off," says DBS's Lo.

Banks are looking at ways to overcome these problems, including by pooling data.

"IMA has certainly got limitations," UOB's Chew says. He highlights the modellability of complex or exotic products as a particular challenge.

"Overall, though, there is still an incentive for us to move to IMA for capital purposes and better risk management, and we can reflect the impact through pricing to clients too," Chew adds. ■

Previously published on Risk.net

¹ Bank for International Settlements, Triennial central bank survey of foreign exchange and OTC derivatives markets in 2016, December 2016, <https://bit.ly/2bFmg0>

² DBS, Digital Bank of Singapore, 2017, <https://bit.ly/2VypjFz>

³ UOB, UOB annual report 2017, <https://bit.ly/30fjgpl>



Turning the IMA into a competitive advantage

Following the clarification of the FRTB rules in January 2019, financial institutions are now working towards a 2022 implementation deadline, finalising how their trading books will operate under this demanding regulation. Eoin Ó Ceallacháin, head of product marketing at Murex, examines how some banks are starting to assess differentiating profit-generating opportunities now that the regulatory fog is lifting

The Basel Committee on Banking Supervision's finalisation of the FRTB rules last January brought welcome clarity to banks, which face the challenging task of revising business plans to cope with FRTB. With the January 2022 deadline looming, strategic decisions are needed soon. The expanded red, amber and green zones have been broadly welcomed by the industry and regulators alike – as have the relaxation and simplification of the risk factor eligibility test. Until recently, the perceived wisdom appeared to suggest that the internal models approach (IMA) was simply a non-starter for all but the largest global banks. But this story has evolved since January in two significant ways.

First, capital charge increases were confirmed under the standardised approach (SA) – also known as the sensitivities-based approach – which affect several important business lines. For example, foreign exchange risk under the 2016 FRTB-SA rules was projected to be 120% greater than the IMA. Under the 2019 rules, this has increased to 220% (see *Standardised approaches lose out in FRTB update*, page 22).

A further punishing example is the restoration of risk weights for equity risk factors, with an increase of 30–60%, which impacts not only cash equity trading, but all structured products linked to investment funds.¹

Second, the attractiveness of the IMA at desk level may be increasing for some players. Some



banks – especially those in emerging markets with extensive trading operations in non-dollar currencies – are understood to be considering the IMA for their forex cash desks. For credit markets, the final version of the SA text prevents banks from offsetting the widely used credit default swap indexes – such as CDX or iTraxx – against their single-name constituents for correlation trading portfolios (see *Final FRTB tweak 'will kill correlation trading'*, page 24).

More generally, an increasing number of banks seem keen not to close the door on new profit-making opportunities to which FRTB structural disruption may give rise. With the regulatory picture now clearer – though not completely, due to the required jurisdictional adoption of global FRTB rules – cost-benefit analyses with higher predictability are now possible. Learning from the

first adopters supports the view that revamping the enterprise market risk framework goes a long way towards being FRTB-IMA ready.

The transformation journey involves the three Ps: people, processes and supporting technology platforms – with the last often being the most straightforward. The remaining effort required for IMA approval revolves largely around risk factor classification and modellability, which drive the required global expected shortfall and stressed expected shortfall capital add-on. Feasible within only a few additional project months, this incremental investment equips senior management with valuable 'what-if' analysis capabilities to quickly exploit new desk-level business opportunities as they emerge.

All told, the competitive manoeuvrings around the IMA will make for interesting watching. ■

¹ Samuel Wilkes, Risk.net February 2019, *Banks rocked by U-turn on FRTB equity risk weights*, risk.net/6355131



FRTB 2.0 – still too complex

Need to know

- Rulemakers have finalised their long-awaited overhaul of the market risk capital regime due for adoption in 2022.
- For banks wishing to use their own models to calculate capital requirements, the framework will be complex and expensive to implement.
- Concerns centre on the key test for modelling profit and loss: "There is still a lot of engineering work that needs to be done," says Nomura's head of risk methodology.
- Banks fear the costs could threaten the viability of certain business lines.
- Sugaring the pill is the promise of lower capital compared with the previous 2016 version of the rules.

Revisions to market risk rules fail to ease complexities of internal models approach. By Samuel Wilkes

When global standard-setters first revealed their planned revamp of trading book capital rules, bankers responded with furrowed brows. The new regime was dizzyingly complex, costly to implement and, worse, packed a huge capital hit.

Several consultation periods later, the Basel Committee on Banking Supervision has released its latest – and supposedly final – version of FRTB. The good news for banks? The capital impact is lower. The bad news? The rules are as complex and costly to implement as ever.

"I don't think the FRTB framework has been made any easier. There is still the burden of

running all of the machinery for internal models, which is disproportionate compared to what we are used to," says a senior risk manager at a large European bank.

The promise of softened capital treatment is clouded by uncertainty over exactly how large the reprieve will be. The Basel Committee estimates that capital will increase on average by 22% – a big difference from the mooted 60% hike in the 2016 version of the rules. But the effect on individual banks could vary wildly, with some firms expected to see their capital shrink by around 19% and others swell by as much as 58% (see figure 1).

Bankers also complain that the rules target certain asset classes more than others. Market risk accounts for a small proportion – around 5% on average – of banks' overall risk-weighted assets, so any uplift in capital is only a blip for the institution as a whole. However, banks often consider the profitability of trading desks on an individual basis, leaving firms in a quandary over whether to shutter business lines that are too much of a drain on capital.

"A 20% uplift would be under 1% effect on total capital for banks in Europe so not difficult to absorb," says a capital manager at a second European bank. "However, this is not how banks work. In general, banks apply the use test to businesses and actively consider the consumption [of capital] at lower business levels. The extra 20% is a very significant uplift to accommodate."

Banks have a choice of two methods for calculating capital under FRTB: a regulator-set sensitivities-based approach (SBA) or, if trading desks pass certain tests, an internal models approach (IMA). One of the internal tests measures how accurately a trading desk is able to model its profit and loss (P&L). This P&L attribution test has gone through significant revisions between its first design in 2016 and the final version of the rules published on January 14 this year.

The changes have made it easier for banks to pass the test, without reducing the burden or costs of implementing the infrastructure needed to run it, bankers warn.

"The rules have been modified to be a little bit more sensible but we will still have to spend roughly the same amount in implementing this as we would have done in 2016," says a modelling expert at a third European bank. "I wouldn't underestimate the operational effort to get these things up and running."

"The P&L attribution test will still be the most difficult piece of FRTB to implement," agrees Eduardo Epperlein, global head of risk methodology at Nomura. "There is still a lot of engineering work that needs to be done."

Under the previous version of the rules, a desk that fails the test tumbles from the IMA to SBA. The industry complained this would cause a cliff effect on capital, so the Basel Committee proposed an amber zone to act as an intermediate phase. Banks pointed out the green and amber zones were too narrow to be effective, so rulemakers widened these zones in their latest version of the regime. However, banks are still not confident of passing the new test as it has only been tried with hypothetical portfolios.

"We don't yet know how much the figures show an improvement because we haven't tested it on



"I would be very suspicious of any reliable number on NMRF capital charges because there has been a lot of changes"

Eduardo Epperlein, Nomura

real portfolios," says the modelling expert at the third European bank. "It is a good starting point but it might be something that needs to change [in local legislation]."

Desks that slide into the red zone also face a struggle to haul themselves back to internal modelling. Similar to traffic lights in continental Europe, desks can transition from green, to amber, to red. But there is no amber stage in the opposite direction. Once a desk is stuck in red, the only way of advancing is to jump straight to green.

"There is an asymmetry between going from green to amber to red and not being able to go from red to amber the other way," says a market risk expert at a European bank. "That has to evolve and be further calibrated because you could be waiting a long time before you're back on internal models."

The P&L attribution test requires desks to compare the "hypothetical P&L" generated by front-office pricing models with a "risk theoretical P&L" based on inputs for the risk management model. If the results of these two models are too dissimilar,

the desk fails the test. Hence, banks will have to begin to align their back-office risk models with pricing models used on the trading desk.

Azar Khurshid, a director in global risk management at Mizuho International, says: "Throughout the years, banks' trading desks and back-office risk management have developed independently. Even if they are using the same models to price risk they could be using different data. If you are using the same data and models you might be validating them differently. There are so many variables that will need to be aligned."

The Basel Committee has made concessions in allowing banks to match up data inputs between pricing and risk model P&Ls subject to supervisory approval. The trading desks of large, multinational banks are often not in the same time zone as back-office risk management. Predicting future values of an instrument based on observed prices from different time series can cause breaks between the pricing and risk P&L.

Epperlein of Nomura says: "If we had four time zones for a trading desk, the moment you reach close of day it causes disconnections between the risk engine and front office. We can now align those inputs to avoid disconnections."

And relax...

Away from the demands of internal models, firms using the SBA can expect lower capital under the latest framework compared with the 2016 version. Bankers have welcomed a relaxation of risk weights for interest rate risk, down 30%, and foreign exchange risk, down 50%. Covered bond risk weights have also been reduced from 4% in the 2016 FRTB to 2.5% and 1.5% for bonds rated AA– or higher. This change will particularly help European banks that sell mortgages to investors in covered bonds rather than securitisations.

European banks also gain a capital reprieve in the form of extra flexibility in calculating capital for forex risk. In particular, the change helps banks affected by movements in exchange rates between forex swaps relative to the currencies that banks use to report their capital ratios.

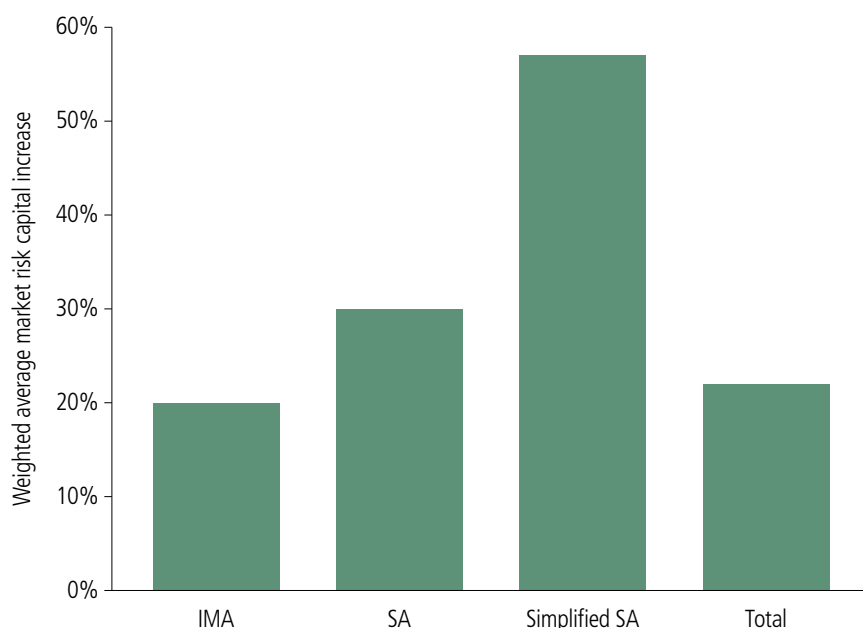
In the 2016 version of FRTB, banks had to capitalise forex exposures arising from movements in exchange rates between their reporting currency and swap currencies. This forced many non-US banks to perform the calculation twice

1. Size, leverage and liquidity risk of US financial institutions

Number of banks	25th percentile	Median	75th percentile	Weighted average
40	-19.3%	16.4%	58.1%	21.7%

Source: BCBS

2. Estimated changes to market risk capital framework under amended FRTB compared with Basel 2.5



as they often trade currency pairs (especially involving US dollars) where both currencies are different from their reporting currency – for example, eurozone banks reporting in euros. US banks on the other hand primarily trade and report their capital in US dollars.

Now, banks can nominate a base currency and calculate the exposure relative to that currency, subject to approval. They would then convert the capital charge in the nominated currency into their reporting currency by using the spot exchange rate. The Basel Committee has not included the effect of this relief in its estimates for the capital impact of the latest FRTB.

“For some banks, a big problem with the former forex curvature formula was the double-counting of capital on cross-currency pair options not involving the domestic currency, and the resulting non-level playing field with banks trading options mainly

against their domestic currency,” says a consultant. “It is a good development that the regulators have been more flexible and recognise banks were facing different situations and client needs.”

The latest rules also alter the calculation used to capture the risk of changes in correlation between instruments in a portfolio during bouts of market stress. Banks have to calculate capital under three correlation scenarios: low, medium and high, where the medium scenario is the current assumed correlation of the portfolio. The scenario producing the highest capital number has to be used as the minimum capital requirement.

Under the 2016 FRTB, the low-correlation scenario imposed a 25 percentage point reduction in correlation compared with the portfolio assumptions – so for a portfolio that is currently 99% correlated, the bank would have to calculate its behaviour if this correlation dropped to 74%.

Hjalmar Schröder, head of market risk at Swiss regional bank, Zürcher Kantonalbank, says this would send capital charges “through the roof” for highly correlated but low-risk portfolios.

Banks are now able to reduce correlations by a sliding scalar in exact proportion to the gap between the existing correlation level and 100% correlation. Hence if a portfolio is 99% correlated, then the low scenario means reducing this to 98%. The maximum possible reduction in correlation is 25 percentage points, for portfolios with a current correlation of 75% or lower. This leads to lower capital outputs for hedged trades using instruments that are relatively stable and highly correlated, such as interest rate swaps.

“We were happy to see the change to the low-correlation scenario confirmed, as this assures an appropriate recognition of hedges, especially for interest rate derivatives,” Schröder says. “For example, the new formula doesn’t penalise interest rate risks that you have against swaps with three-month Libor versus a six-month Libor hedge, which is a low-risk strategy and shouldn’t have had the capital charges the low-correlation scenario used to produce.”

Internal affairs

The promise of lower-than-expected capital on the regulator-set standardised approach (SA) will not necessarily result in banks flocking to use this method. Using internal models is still preferable for banks that are able to: Basel estimates that these banks will see a 20% average increase in capital versus a 30% increase for the SA (see figure 2).

A key part of the IMA is a test of whether trading desks have enough observations to prove risk factors are modellable. Non-modellable risk factors (NMRFs) must be separately capitalised with a stress capital surcharge. In the most recent iteration of FRTB, the test and capital calculation for NMRFs has been significantly relaxed.

“The NMRF charge used to be many multiples of the expected shortfall number,” says Epperlein. “It could have been as many as five times bigger, which is just too high of a penalty for liquidity. Unless it is a fraction of the expected shortfall generated on internal models, it is not a credible number.”

Epperlein sees 30% as a credible add-on number for NMRFs but it is not yet clear whether the changes by the Basel Committee will match that number.

For banks to model a risk factor they need to have either 24 real price observations of a risk factor within 12 months and no gap between three observations spanning longer than 90 days, or have 100 real price observations.

The changes will increase the number of risk

CORRELATION TRADING PORTFOLIOS AND FRTB

The sensitivities-based approach is the only option for calculating capital for correlation trading portfolios – bank-issued portfolios containing securitisations and credit default swaps referencing baskets of underlying single-name credit default swaps – meaning banks are barred from using internal models.

A modelling expert at a large European bank points out correlation trading portfolios could be

unduly hit by FRTB as the risk charge does not allow banks to recognise all single-name hedges made on exotic securitisations.

“The way the charges are described in the text contradicts the risk management practices of the correlation trading business,” says the modelling expert. “You can be hedged from your mark-to-market perspective but not hedged on capital. That is not a good outcome of any regulation.”

“We don’t yet know how much the figures show an improvement because we haven’t tested it on real portfolios”

Modelling expert at a European bank

factors banks are able to model by widening the maximum possible gap between observations as well as allowing banks to use proxy data to infer risk factors and their own quotes as observations.

Allowing banks to use proxy data could be beneficial for instruments that can’t meet the criteria for modellability. In order to be able to use proxy data, banks must demonstrate the proxies don’t have significant idiosyncratic risk compared with the real price for observation.

Khurshid of Mizuho says this means they should be able to use indexes to prove observability of, for example, Japanese municipal bonds, which are mostly traded in primary markets.

“It means we can now pass the modellability test for local markets that trade mostly on primary issuances,” he says.

It is not clear how far the changes to NMRFs will

lower the capital impact to desks using internal models. The Basel Committee has assumed the changes will result in a 60% drop in capital from the previous FRTB.

“I would be very suspicious of any reliable number on NMRF capital charges because there have been many changes and there was also the problem that until recently many firms hadn’t calculated a reliable NMRF because they made a lot of simplifying assumptions,” says Epperlein. “It was only right at the end that many firms did the more realistic NMRF calculation which then led to many changes to the framework.”

An end to the vendor?

The relaxation of the observability test could decrease the need for vendor solutions and presents a way for banks to cut costs of implementation.

Vendors had planned to either offer banks their own real price data or pool price submissions from banks and sell the aggregated data back to banks.

“We will have less reliance on data pooling services, especially for markets where we are the market-maker now,” Khurshid says. “There was a significant amount of work to even participate in these services.”

Desks where banks aren’t market-makers and so have fewer observations are also less likely to be using the IMA, meaning they wouldn’t face the NMRF charge anyway.

The Basel Committee has clarified that banks can use their own and other banks’ quotes if they are validated by a third-party vendor. But some banks are deterred by the governance processes they would need to adopt to ensure quotes are genuine. Firms leave themselves open to operational risk if their own or other bank traders are accused of offering quotes purely for creating observations to use in FRTB or using quotes that aren’t for trading purposes.

Any regulatory penalties imposed for governance failures are an added worry for banks that are watching nervously as the costs of FRTB mount up. ■

Previously published on Risk.net

WEIGHTING GAME: EQUITY TRADING UNDER FRTB

For equity desks that are unable or unwilling to use internal models, the standardised approach (SA) comes with unwelcome costs. To the surprise of bankers, the Basel Committee reverted back to higher charges for equity risk factors set out in 2016, rather than adopting the lower scalar proposed in the March consultation.

For portfolios of options on single-name equities, the reversed risk weights may cause unpredictable swings in capital requirements.

“For equities the 2016 risk weights were causing somewhat strange fluctuations in capital,” says Hjalmar Schröder at Zürcher Kantonalbank. “If you had a couple of options on financial stocks that were 30% out-of-the-money and had three weeks to expire, you don’t really focus on them in risk management as they represent extreme tail risk, well beyond the kind of shocks that drive the stressed value at risk under Basel 2.5. If you then have to apply a 50% shock under the 2016 FRTB those positions suddenly drive your capital charge on the SA. Then they’d expire and your capital requirements would fall back down again.”

The Basel Committee has, however, introduced two new risk weights intended to lower the capital impact on equity index derivatives. It is unclear whether this will benefit trading desks because banks often use an alternative treatment for indexes that lowers the amount of capital compared with the assigned risk weights.

Under this approach, known as look-through, desks use the risk weights of individual components of an index to determine capital requirements for the instrument. If equities within a single index are sufficiently uncorrelated, banks are able to apply a lower risk weight.

The rule change could reduce the operational costs of using the look-through approach on index derivatives used purely for hedging as banks will not need to monitor the underlying components.

Investments in equity funds could be heavily penalised in the final framework as they will have to use the higher risk weights for equities. A senior risk manager at a

European bank argues banks are far more likely to use the look-through approach for indexes rather than funds because it is easier to acquire information needed to use the approach.

“Investments in funds are penalised because they don’t have their own bucket like there is for indexes,” the risk manager says. “I find this peculiar because if you’re going to be able to look through anything it is indexes but not funds – because asset and fund managers do not disclose much more information than their mandates.”

If the fund only tracks an index then the bank can treat it as an index and use the lower risk weights. However, if the fund doesn’t track an index it must either be capitalised using the highest risk weight of the sector described within the fund’s mandate or the highest risk weight assigned for a single equity class.

Lack of clarity surrounding the treatment of funds in the calculation for estimating the value of a fund after a default could also pack a further capital hit.

Single-name equities have to be treated as if they have no value once the issuer defaults, which produces higher capital charges.

The final FRTB doesn’t specify how to estimate the value of investment in funds once a default occurs. As the rest of the framework requires funds to be treated as the single highest risk weight, the senior risk manager worries they might also be required to treat it as a single name for the default risk charge, meaning all the holdings of the fund would suddenly be assigned a value of zero if just one company held by the fund were to go into default.

“A fund seems to be treated in the text similarly to single equity,” says the senior risk manager. “It is not stated how it should be treated in the default calculation but implicitly if you’re treating it as a single name elsewhere you’d also treat it as a single name here. That would mean it would have a value of zero but a fund is a portfolio of potentially several thousand equities and not all issuers are going to default together. Attributing a zero value seems harsh.”

A helping hand

Addressing industry concerns

The Basel Committee on Banking Supervision's final revisions to the FRTB guidelines aim to address industry concerns around complexity and capital implications. A forum of industry leaders discusses whether the changes have been effective and how banks are coping with potential variations in regional implementation, as well as the technological, operational and financial challenges of the post-Libor transition



Bruno Castor
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To what extent have the Basel Committee on Banking Supervision's final revisions to the FRTB guidelines addressed banks' previous concerns? Which areas still need clarification?

Bruno Castor, Murex: The amendments to FRTB released in January are a large step in the right direction. The complete revamp of the profit and loss attribution (PLA) test – including the introduction of more robust metrics and new green, amber and red zones – has made the internal models approach (IMA) a realistic option for banks that were previously constrained in adopting the standardised approach (SA) because of temporary breaches.

Additionally, the simplification of the risk factor eligibility test (RFET) – in terms of both detail and breadth – has been received positively. The diversification benefit correlation introduced in the stressed capital add-on charge should also have a positive impact.

While progress has been made, certain aspects of this regulation remain unclear at a jurisdictional level, and further regional guidelines are expected in the coming weeks.

Eugene Stern, Bloomberg: Two key areas saw changes welcomed by the industry:

- **The PLA test:** the Basel Committee provided the industry with a number of revisions, including the metrics that will now apply (Spearman correlation and Kolmogorov-Smirnov tests) and how frequently the test is applied (quarterly instead of monthly). The Basel Committee also introduced the new amber zone as part of the traffic-light approach to mitigate potential cliff-edge effects of failing the test.
- **The RFET:** the Basel Committee made changes to the test for classification of risk factors between modellable and non-modellable to alleviate the effects of seasonality which the industry previously identified. While the Basel Committee chose to retain the minimum number of 24 real price observations, it replaced the maximum one-month gap threshold with a relaxed requirement of evidencing a minimum of four observations in any 90-day period. For risk factors that fail this test, the revised rules include an alternative criteria enabling banks to satisfy the RFET by evidencing a minimum of 100 observations without meeting any gap or interval requirements.

The committee also confirmed that only one observation should be counted a day, and then separately clarified the use of committed quotes.

Despite the changes incorporated in the finalised framework, many in the industry argue that the changes do not go far enough in addressing seasonality, and while those risk factors are relatively liquid, they may still be at risk of failing the test as currently specified.

The Basel Committee incorporated seven qualitative criteria for the modellability of risk factors that pass the RFET. These much-discussed principles will form an integral part of the data governance required for FRTB. For risk factors that fail the test – non-modellable risk factors (NMRFs) – the Basel Committee accommodated a shortening of the maximum liquidity horizon to be taken into account when computing stressed capital add-on.

Despite the finalisation, there remain areas where the industry will require further clarification to facilitate a smooth implementation. This includes where a look-through approach is required for determining trading book eligibility and treatment of positions linked to funds, indexes or with multi-underlyings.

Hjalmar Schröder, Zürcher Kantonalbank: The Basel Committee has struck a fair balance between banks' valid concerns and the need to keep the framework coherent, sufficiently conservative and not overly complex. With regard to the SA, the calibration of the low correlation scenario and the ambiguity around the treatment of equity index options have been addressed. However, one of the few remaining shortcomings is the lack of recognition for non-linear hedges against linear risks, which is the price to pay for the segregation between delta and curvature aggregation.

Hany Farag, CIBC: The Basel Committee has addressed many concerns among market participants, and the framework has become quite reasonable. There is always an appetite for reducing capital implications further or simplifying the framework even more. However, the Basel Committee's response to industry concerns has been constructive and quite reasonable. We have a framework that is risk-sensitive and manageable.

Azar Khurshid, Mizuho International: General consensus is that the final revisions are well aligned to the concerns of the industry and of national regulators. For instance, the inclusion of index buckets for equity and credit risk classes, the relaxation of the look-through requirements and changes to the stressed expected shortfall (SES) risk charge calculations have been helpful. So too have the reconfiguration of the RFETs, the introduction of the base currency approach for calculating foreign exchange risk class capital, and the adoption of lower risk weights for general interest rate risk and credit risk classes for the SA.

These improvements mean the new regulatory regime will be closer to expectations than before. It is also helpful that the text now includes frequently asked questions (FAQs) and a fully hyperlinked web version.

Areas that need further clarification include the IMA; SA treatment of equity investment funds and regulated collective investment undertakings; treatment of curvature adjustment and the base currency approach for forex risk share for the SA; and certainty over RFET conditions, which could mean a significant narrowing of the group of eligible risk factors.

Most of these topics could and should be addressed in subsequent clarifications through FAQs and regulatory technical standards at Basel and national regulatory levels.

Suman Datta, Lloyds Bank Commercial Banking: The Basel Committee has addressed a lot of concerns and there has been a healthy dialogue via mechanisms such as quantitative impact studies. The main regulatory agenda is now set so now the question is about implementation. The question of timing is crucial. The Basel Committee has given its view, so it is now up to national regulators to confirm the timelines and give banks clarity over their own planning.

The other challenge is Libor. Regulators will need to understand the added complexity and support the industry in Libor transitioning alongside FRTB.



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What will determine banks' choice between the SA or IMA?

Eugene Stern: Banks considering the IMA are comparing its benefits – such as better risk management tools and capital relief – with its costs. These include both the direct cost of implementation and the uncertainty of being able to pass the tests around price observations (RFET) and ongoing front-middle office alignment (PLAT).

The cost of uncertainty is hard to quantify, but is a significant component of many banks' thinking. Banks don't like being unable to predict what capital additions may suddenly arise from any failed tests.

The direct costs begin with risk infrastructure, as banks will need to align data and analytics across multiple asset classes and risk types on a consistent platform. Banks running the IMA may also need to enhance throughput on their calculation grid, as they might need to run up to 15 or 20 times as many simulations as at present. The RFET – which requires banks to prove that the time series used in their risk models are based on observed prices – pushes banks to upgrade the infrastructure they use to track their own trades and connect it with the risk workflow, source data from outside, or more likely both.

There is also a cost around knowledge and/or staffing, and many smaller banks in particular don't think they have the expertise to assess and address the issues implied by IMA.

On the other hand, banks also have several incentives to seek IMA approval beyond just capital relief. Some see IMA status as a competitive signal to the marketplace, connoting sophisticated risk management in line with best practices. Others feel less competitive pressure around IMA, but expect regulatory pressure to implement it – at least for core businesses or the most material risks. One issue here is that the books for which IMA might be most needed are also the books where implementation may be the most challenging.



Hany Farag: There is significant benefit to be derived from the IMA.

The regulators are serious in their calibration of a healthy ratio of SA to IMA – believed to be around 1.5x. It is possible that some banks might be bound by the global output floor but, for the most part, banks should be able to benefit from the IMA. In the long term, however, it is not clear how to run a sophisticated industry with trillions of dollars in trading without the IMA. There may be inertia for some banks to opt for the SA to begin with, to avoid the operational burden. In the long term, however, the curve will be less steep and I predict the percentage of banks using the IMA will likely be comparable to what it is today.

Bruno Castor: For financial institutions that need to comply with FRTB, cost will have the most significant influence on the decision-making process. Following the release of the final FRTB guidelines in January, many banks that previously considered the IMA out of reach are reassessing their situations.

Comparing the 2016 guidelines with those published this year, there has been a significant increase in the SA capital charge. The capital requirements for foreign exchange risk outlined in the most recent iteration of FRTB have, in some cases, almost doubled (see *Standardised approaches lose out in FRTB update*, page 22). With regard to equity trading, there has been a rise in the risk charges for equity risk factors, particularly for large emerging market economy class 2 stocks.¹ Moreover, correlation trading desks will face higher capital charges as they will be prevented from offsetting credit default swap indexes against single-named constituents (see *Final FRTB tweak 'will kill correlation trading'*, page 24).

On top of these changes from the regulator, banks are now benefiting from the knowledge gained by first-movers in the market. Looking at banks that are advanced on their FRTB journey, it is interesting to note that the incremental cost of being IMA-ready is less than market participants predicted, particularly when included as part of an overall review of the enterprise market risk framework.

The leading enterprise risk management systems on the market today already include the main components required to calculate FRTB-IMA. To gain

¹ Samuel Wilkes, Risk.net February 2019, Banks rocked by U-turn on FRTB equity risk weights, risk.net/6355131



IMA approval, the next step is risk factor classification and modellability. If the prerequisites are – or are soon to be – in place, pre-packaged FRTB-IMA business solutions can be implemented within a matter of months to provide global expected shortfall and SES. This enables banks to perform what-if analyses and to have the business option of switching to the IMA for an individual desk, for example, should an attractive business opportunity emerge.

Finally, for some financial institutions, the market risk capital charge seems less significant compared with the credit or liquidity capital charges – and is therefore arguably less important for this group.

Suman Datta: FRTB is trying to connect risk-taking activity with capital consumption, so it's a business decision based on risk versus return cost dynamics as to which desks should run on the SA or IMA. Each bank will have its own strategy based on its range of trading desks, asset classes and individual competitive advantages.

The IMA is more complex and has extra operational overhead costs, but it makes sense to have it for risk management purposes and peace of mind.

There's also a perception that it's all or nothing in terms of applications for model approval. The SA is the baseline requirement, but not every desk has to run the IMA from day one. You can operate a staggered introduction based on risk profile, materiality and strategic business priorities.

Hjalmar Schröder: The first step is an assessment of whether the risk profile of a bank's trading operations can be adequately captured by the methodology of the SA. If that is not the case, there isn't really a choice.

Where the SA is a viable option – as Zürcher Kantonalbank concluded for itself – it should be approached as a sober business case consideration, where the advantages of superior risk insight and efficient allocation of capital need to be weighed against the investment and operational costs of an internal model.

Azar Khurshid: This will be based on each bank's own view, the make-up of its portfolios, current regulatory approval, quality of models, infrastructure and national regulators. This is likely to evolve over time, depending on any transition arrangements at national level.

While current regulatory approval for the internal model is not a guide, we would expect most current IMA waiver banks to seriously consider adding FRTB IMA application to significant parts of their portfolio.



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What are the main challenges around implementation and what will be the impact of post-Libor transition?

Hany Farag: The NMRF framework has been dramatically improved. I do not believe the post-Libor transition will be a major challenge. The challenge is a technological build, operational sophistication and certainly a financial investment. For a multi-trillion dollar industry, this seems a reasonable investment for the next decades. It is challenging but achievable.

Suman Datta: Libor represents a major structural change in the market, and the proposed deadlines are close to those for FRTB. There has been a lot of talk of NMRFs and the potential for higher capital charges, but there's also a logistical challenge: how do you embed such a structural change in transitioning from present state to future state under FRTB? At some point you will need to make decisions such as how you transition the value-at-risk (VAR) model. If you're running FRTB and Libor as two different streams, you need to work out when they need to converge.

Eugene Stern: The convergence of timelines for the Libor/risk-free rate (RFR) transition and implementation of FRTB around 2022 compound the challenges faced by banks in planning for these changes.

For a trading desk planning to seek approval for the IMA, FRTB challenges include:

- Where to obtain sufficient time-series data for the RFR risk factors and method for backfilling based on proxies where necessary
- The remaining trading book risks exposed to legacy Libor-based risk factors the desk may be exposed to, and the risk of not being able to source sufficient real price observations to avoid NMRF consequences.

Beyond Libor replacement and RFET/NMRF, the RFET poses both systemic and organisational challenges. We've heard from a number of banks considering the IMA that the organisational challenges should not be underestimated.

For the SA, a challenge for banks that may have all the analytics in place is the required risk bucketing. Bloomberg has received a number of questions around this – even from some larger banks.

Hjalmar Schröder: From a project perspective, one of the key challenges has been working with a fluid set of requirements that changed as soon as the answers and revisions to the FAQs were published. Adopting an agile approach during development has proven very helpful in this environment.

As far as content is concerned, key challenges have been the alignment between profit and loss (P&L) and risk systems as well as managing the data needed for correctly mapping our positions to the risk factors of the SA.

While the transition away from Libor simplifies the risk factor landscapes by consolidating the different reference tenors, banks must deal with the lack of historical time series for the new benchmark rates.

Bruno Castor: To meet the FRTB implementation deadline, the first step is investing in the right technology. Murex is seeing more and more financial institutions take a holistic approach to compliance, partnering with technology vendors that offer a single platform to address regulatory demands and risk management requirements. The key challenges facing banks include a gap in knowledge and experience, the decommissioning of legacy systems and an evolving capital markets landscape.

Murex has set up a global team of FRTB experts to share the learnings from client projects that are already live, as well as those coming down the road. The more FRTB projects we undertake, the more we discover issues of mutual interest across our client base – whether it be interpretation of the detailed rules, data mapping and classification approaches, or the day-to-day operational process setup.

Often, FRTB compliance requires investing in new technology while also decommissioning legacy risk systems that cannot meet new and evolving regulatory demands. Banks need to balance these two projects, injecting new technology and functionality as soon as possible while untangling a web of existing systems. To overcome this challenge, it is important to partner with a technology provider that includes this additional element in the FRTB project structure from the very beginning.

Many capital markets participants are working on addressing Libor reform at the same time as FRTB. They are currently deeply involved in the impact analysis, and interplay with the FRTB implementation timeline is clear. Having a common interest rate curve framework across trading and risk for all asset classes, along with harmonised pricing, is a good place to start.



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Are the timelines realistic? What schedule should banks be working to?

Hjalmar Schröder: Having opted for an early project start, the Basel Committee's timelines appear realistic for Zürcher Kantonalbank. When setting their road maps, banks should allow sufficient time to familiarise themselves with the behaviour of the new methodology in a real-world environment and to allow the business processes around the new standards settle in.

Hany Farag: Overall, the timelines of 2022 are reasonable, and the fact there is a subsequent year for PLA to become fully binding adds a fair cushion as well. The target should be 2022. Sophisticated programmes of this type cannot afford to aim lower than expected.

Azar Khurshid: While most global systemically important banks seem to have fairly well advanced FRTB programmes, the scale of the challenge is not just in producing the calculation results. There are implied changes to the operating model that will also need to be agreed and bedded down, including increased monitoring of the trading book/banking book boundary, establishing workflows for calibration of NMRFs, SES, and so on, as well as aligning the front office with the risk models and data.

National regulators will also need to be prepared to process a significant number of applications. We are hoping to make a single application for all IMA desks at the same time to reduce the burden and turnaround time.

Bruno Castor: For many financial institutions, the road to FRTB compliance began several years ago. Due to regulatory uncertainty, this path has not been smooth, with some pausing projects while waiting for clarification and guidance. Others decided to move forward steadily, using FRTB as an initial driver for more large-scale IT transformation projects. Following the publication of the final guidelines, the market is heading towards the 2022 deadline with increased urgency and, although there are still challenges ahead, I believe the timeline is realistic for most.

At this stage, banks should be aiming to not just tick the boxes of the minimum compliance threshold. Rather, they should be thinking long term. With the right technology partner, FRTB is not only manageable, it can bring a lot of value to your business.

Suman Datta: The timeline is, again, connected with business decisions. If you want to be an IMA bank from day one, it's a case of deciding where you want to be and working back – ensuring you have the necessary infrastructure and governance in place in good time to have your model application validated by regulators. If you're at the back of the application queue, it's unlikely you'll be a day-one IMA bank, but the dates should be achievable – particularly if you are phasing the introduction of IMA.

What steps are banks taking to adapt existing systems and processes?

Azar Khurshid: We split this into separate workstreams where possible. Each stream then determines which systems or infrastructure needs to adapt to be compliant. This can be achieved through regular updates – such as for the policy workstream – in-flight projects or FRTB-specific projects. FRTB impacts several traditional functions and departments, so these are multidiscipline workstreams.

Hany Farag: A redesign of existing systems and processes is advisable, and close realignment of front office, risk and finance needs to be implemented. FRTB is quite binary; either you do it well and reap the rewards, or you will wish you had just opted for the fallback SA approach for the time being.

Eugene Stern: Moving to FRTB is a huge project for many banks, and in many cases it starts with assessing budget and putting dedicated teams in place. Once in place, the team has a lot of decisions to make early on: whether to go for IMA approval, and for which desks? Will the bank need to change some of its business structures? Banks will also need to decide how much of their current risk current risk infrastructure will be fit for purpose going forward. They'll also need to determine what can be adapted versus what needs to be scrapped and replaced altogether. Lastly, banks will have to evaluate whether they can build the necessary solutions internally or must seek out vendors.

The fact that some banks that use the IMA today may move to the SA under FRTB because of the complexity of FRTB-IMA has some interesting consequences for the maintenance and adaptation of risk systems. Banks using the IMA today typically also use VAR/expected shortfall for internal risk management and reporting, and they don't expect to give up VAR models internally even if they move to FRTB-SA for regulatory capital. This category, which may include many regional banks, will have to decide how much to align their regulatory and internal risk models and platforms going forward. In particular, some banks are now deciding to stick to the SA for regulatory capital but are simultaneously taking the opportunity to upgrade their VAR systems for internal risk management. They have the budget to upgrade their risk infrastructure because of FRTB, and are taking the opportunity to kill two birds with one stone.



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Suman Datta: First, you need to take a step back. FRTB has an impact on systems, analytics, models, methodologies and operating models. Once you have identified the main areas that need attention, you need to get the key people involved to come together. Lloyds decided a couple of years ago to have front-office pricing model-based calculation for our capital under FRTB, and we built a team around it with pricing and risk model experience. Likewise, when you look at the technology stack, you need a blend of skill sets that covers the necessary areas. And when it comes to the operating model, closer alignment between the front office, finance and risk makes it easier to resolve any issues, such as comparing numbers for the PLA test.

My portfolio quantitative research team is a good example of the added value this can bring. There are many other portfolio models in use within the bank – such as those in initial margin, PLA, prudential valuation, independent price verification and stress-testing. Having the same team working across these models to test risk scenarios and calculate P&L for the various portfolios means we can develop a unified platform and consistent analytics and metrics.

Hjalmar Schröder: The investment need that accompanies FRTB has been a catalyst for consolidating the system landscape and pooling consistently defined data across systems.

Another focus is the alignment between risk and P&L – not only on the systems side but also along the axes of organisational structure and business processes.

What problems will banks face in optimising pricing models?

Hany Farag: Some products and pricing models will represent real challenges because of the large number of simulations used for pricing and the number of scenarios generated by risk.

Additionally, some historical shocks – when combined and applied to the current state of the market – can produce scenarios that are difficult or impossible for front-office pricers to consume directly.

Suman Datta: Pricing models are typically built with a certain set of parameters and typically operate within a certain range of these inputs. But they may become stretched under new scenarios in FRTB to a point where they fail to calibrate, or lead to a state of being arbitrageable. Empirical testing is needed upfront to understand the dynamics and model behaviour and address the problem.

The other problem comes with the scenarios you're generating. Depending on the available data – such as historical time series – scenarios might lead to arbitrageable states or inconsistent and spurious market data states. So how do you generate a realistic scenario? This is again a major piece of work, and you need to do it well in advance, allowing enough time for model owners to work on generating realistic scenarios and potentially address issues in historical time-series data.

Finally, the number of calculations needed means the computational challenge is much higher. You may need to give advance notice to technology partners to ensure capacity is available. This planning needs to happen now.



Azar Khurshid
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Azar Khurshid: In the FRTB sense, the optimisation means aligning the risk-theoretical P&L with the hypothetical and actual P&L. This is only possible with a very good understanding of both the pricing models, as well as the PLA. Unfortunately, the more complex products tend to have high number of inputs, some of which may be non-modellable or may become so under stressed periods. Alignment of the front-office models and data with risk also presents its own challenges. For example, the front-office team may not update data or model outputs for no-risk positions, which can lead to gaps in historical data for simulation and calibration purposes.

Hjalmar Schröder: Pricing models can be divided into three categories serving distinct purposes: quoting, marking-to-market and risk management. Banks are in a constant race to optimise their quoting models to win the right transactions at the right price. Mark-to-market pricing models have followed the increase in sophistication to avoid significant differences in transaction pricing. In risk management, however, the primary drivers are consistent dynamics and modellable inputs. Thus, these pricing models have remained more standard. The FRTB requirements for PLA will limit how far models used for mark-to-market can deviate from those used in risk management. Therefore, optimisation of pricing models used in the P&L process will have to be matched to the models used in the risk engine. Where this is not possible, trading desks might have to get used to more P&L noise between quoting and revaluation.

How will banks cope with potential variations in regional implementation?

Hjalmar Schröder: While a globally homogenous implementation of standards would be highly desirable, the degree of regional variation that will be introduced by national regulators is hard to predict. Banks should therefore make the adaptability of their processes a key criteria when choosing a vendor product or building an in-house solution.

Azar Khurshid: One of the key motivations for the Basel Committee's FRTB proposals is to create a level playing field and ensure no regulatory arbitrage. One could therefore argue that regional variation is likely to be minimal. Parameter and treatment interpretation will need to be closely watched by banks that face off with multiple regulators. While variation in interpretation and parameters may be less likely, one would expect differences in the implementation schedule. This is potentially tricky to manage, with banks having to maintain multiple systems and calculations for different regulators at the same time.

Hany Farag: My belief is that the regulators are trying to converge rather than diverge and are not likely to allow for too much variation. It is, however, too soon to judge as regional implementations are not yet fully announced. ■

>> The panellists' responses are in a personal capacity, and the views expressed herein do not necessarily reflect or represent the views of their employing institutions

FRTB is here – Now it's up to local regulators

Each jurisdiction must produce its own version of FRTB; until then, banks are hanging back. By Samuel Wilkes

The Basel Committee on Banking Supervision has finished with FRTB, and local regulators must now give it their own national slants.

So banks are watching and waiting. And they say they have reasons to be gun-shy.

"The Basel Committee has put out this text, but it is really now for domestic regulators to start to make noise about implementation, because we have been here before," says one market risk manager at an Australian bank, referring to the expensive commotion that followed the 2016 version of FRTB, only for a 2019 deadline to be junked the following year.

"Regulators at the domestic level need to come out with a message to say: 'This is the final version of the FRTB and the timelines are set for 2022.'"

It has been only a month since the committee issued its final amendments to FRTB, and its effective date is not until January 2022, giving national regulators some time. But having been burned in the past, banks seem to be waiting for their local authorities rather than taking up the new standard with both hands.

The first iteration of FRTB appeared in January 2016, and was met by vociferous opposition, prompting the committee in December 2017 to say it would amend the rules. In the interim, banks trimmed back FRTB projects to their bare essentials.

Need to know

- FRTB is at various embryonic stages at the four big regulators – the Federal Reserve, the UK's Prudential Regulation Authority, the European Banking Authority and Japan's Financial Services Agency.
- European lawmakers decided in December to put the reporting requirements into effect before the capital requirements. Sources expect reporting under the standardised approach to begin in December 2020.
- In the UK, FRTB's progress will depend on Brexit. Fed officials have previously said they hoped to nail down rules "2019-ish".

"It is very early days, but the uncertainty around the local regulators will remain at least for another year"

Azar Khurshid, Mizuho

But even with the final version in hand, banks are cautious. Besides regulators, some also wonder whether local legislators might try to further amend the standard or set aside the committee's timeline.

"If we get a bit more certainty from the Federal Reserve and the EU on the timelines," says a modelling expert at a European bank, it will help people "start to implement this for real".

FRTB is in various embryonic phases at the four big regulators.

The US Federal Reserve declined to comment on the issue.

In the UK, Brexit will determine what happens with FRTB. If former prime minister Theresa May's deal is agreed, the UK will be tied to the European Union's single market and its laws until at least December 2020, keeping it on the EU's schedule for FRTB. If not, the UK's Prudential Regulation Authority will be free to draft the rules as it wishes.

A PRA spokesperson commented, "Our current assumption is that we will proceed with implementation according to the Basel timeline."

In Japan, two sources say the country's Financial Services Agency has indicated it plans to enforce FRTB in March 2022. The agency, however, sidestepped the issue, saying that, keeping in mind the Basel timetable, it aimed for a "smooth introduction of the regulation after a sufficient consultation with relevant parties".

Europe may be the furthest ahead in the process.

Europe moves ahead on reporting

Of the largest regulators, the Europeans have a small bit of momentum. On February 15, the Council of the European Union published a draft of the final version of updates to the EU's capital requirements regulation (CRR II). The document reiterated that the EU will first put FRTB into effect as a reporting

requirement, leaving the capital rules for later – a decision taken in December 2018.

Reporting is likely to begin under the regulator-set sensitivities-based, or standardised approach (SA) by December 2020. First, the European Commission must pass secondary legislation putting the Basel Committee's latest changes on the standardised approach into effect by December 31 this year; reporting would start a year later.

Less certain is when banks will be allowed to report under the internal models approach (IMA). The draft text states internal modelling could begin three years after the European Commission (EC) passes the four secondary pieces of legislation drafted by the European Banking Authority (EBA). Those pieces of secondary legislation will also transpose the recent changes made by the committee on internal modelling into EU law.

The EBA says it has begun discussions with the industry and will begin collecting data on non-modellable risk factors (NMRFs) soon.

"We are likely to initiate a limited-scope data collection exercise at some point, assessing banks' NMFR shortly after the publication of CRR II," a spokesperson says. "We are, however, still at a development stage, but given the complexity of the topic, have started informal discussions with the industry."

The EBA must draft that legislation on internal modelling by March 27, 2020. However, it is unknown whether the EBA will make changes to the legislation or how long the EU's legislative process will delay the pieces of secondary legislation.

On that timeline, the EBA would need to complete its work by January 2020. But there is no timeframe on how long the EC and EU legislators will take to adopt the EBA's standards.



“Regulators at the domestic level need to come out with a message to say: ‘This is the final version of the FRTB and the timelines are set for 2022’”

Market risk manager at an Australian bank

The EBA may also have to make clarifications or changes to the standards published by the Basel Committee before implementing them as a reporting requirement.

“If what you have already implemented in the [Basel] rules changes, then it will, of course, have an implementation cost,” says a market risk expert at a second European bank.

A senior risk manager at a third European bank believes FRTB may go through another series of amendments in Europe once reporting begins and regulators get a clearer idea of how the capital requirements will work in the market.

They point to the calibration of parameters for a key test in using internal models – the profit and loss attribution (PLA) test, which compares the alignment between trading desks’ risk and pricing models – potentially changing once reporting on the IMA begins.

The committee relaxed the thresholds for trading desks to pass the PLA test by introducing an amber zone between the thresholds for passing and failing the test, though not as far as

bankers wanted. As the test has not been tried on real portfolios, banks remain concerned that the redrawing of the parameters did not go far enough. If the reporting period confirms the banks’ position, they feel regulators might give them the slack they want.

“I don’t think it is the final word,” says the senior risk manager. “We have maybe a bit less concern compared to somebody that has the final rules on the points between the three thresholds in the PLA test.”

And according to the draft final version of CRR II, FRTB will be converted into a capital standard within the next package of reforms to the EU banking laws – a process that could take until 2025.

In the US, the Fed’s initial diffidence toward FRTB has given way to acceptance, despite early Trumpian rhetoric on foreign standards bodies.

The Fed has not unequivocally committed to the Basel Committee’s timeline, but it has given indications it might. Norah Barger, a senior policy adviser at the Fed, said at an International Swaps and Derivatives Association (Isda) conference held

last June that the US might use the EU’s timeline on FRTB to avoid pricing distortions between EU and US markets.

David Lynch, a deputy associate director at the Fed, estimated at another Isda conference last April that US FRTB rules would be nailed down “2019-ish” to give banks time to align with the standard for 2022.

And now we wait

Azar Khurshid, a director in global risk management at Mizuho in London, believes the general uncertainty around local regulators in implementing FRTB could drag on for another year as they come to grips with how the new FRTB will play out on their local markets.

“It is very early days, but the uncertainty around the local regulators will remain at least for another year,” says Khurshid. “The local regulators are now expected to conduct a QIS [quantitative impact study] and consult with the industry to figure out the impact on their markets.”

The EBA is preparing to collect data on NMRFs that will be subject to a capital surcharge under FRTB, sources say. The data-gathering would begin shortly after CRR II becomes law, according to sources.

Without firm timelines, it’s tough to get the budget for FRTB projects, the market risk manager at the Australian bank says.

“Until banks start to hear anything from their regulator, getting projects signed off is difficult when competing for resources with other implementation projects we are undertaking,” says the market risk manager.

Due to the cloudiness around the rules, banks have been selectively adopting parts of FRTB that are either beneficial to the bank or unlikely to change significantly.

Some smaller institutions have gone ahead and implemented the standardised approach because they didn’t expect the Basel Committee to alter the methodology, and instead anticipated only minor changes to the risk weights, which would raise costs slightly.

“We decided we wanted to be very early in implementing the FRTB SBA,” says Hjalmar Schröder, head of market risk at Swiss regional bank, Zürcher Kantonalbank.

“Starting with the first version and going through the subsequent changes was probably not the optimal decision when you look at cost alone,” he says, “but in terms of learning what was important and being confident we can deliver FRTB in time – without needing to search for everybody with expertise at the same time as other banks do – it was overall a very good decision.” ■

Previously published on Risk.net

Banks hope final FRTB rules will ease NMRF burden

The internal models approach is buoyed by more liberal rules on price observations and risk factor aggregation. By Steve Marlin

Banks have found reasons to be cheerful about the latest iteration of the Basel Committee on Banking Supervision's revised market risk capital rules, which allow many more risk factors to be included in internal models without the need for costly add-ons. There's one obvious reason for that: taken together, the new rules could nearly halve the spike in capital requirements contemplated in the previous review.

The January 2019 revisions to FRTB addressed many of the issues banks raised during a consultation in March last year – among them, the frequency of price observations required for risk factors to be eligible for modelling, or else be deemed non-modellable (NMRFs). With fewer price points needed, the number of NMRFs should drop, and the internal models approach (IMA) becomes more attractive.

Need to know

- The 2019 revisions to FRTB create paths to reduce the number of costly non-modellable risk factors for banks using the internal models approach.
- Risk factors now need less frequent price observations to qualify as modellable. The manner in which they are aggregated, and in which capital requirements ratchet up as a consequence, has also been softened.
- In addition, a common stress period can now be used for risk factors belonging to a single risk class, rather than the worst period for each individual factor. The liquidity horizon for stress-testing NMRFs has also been shortened.
- Banks say the revisions make the internal models approach relatively more attractive than the standardised approach, a reversal from the original version of the rules, which were tougher on in-house approaches.
- The effects of all the revisions in the latest FRTB could nearly halve the leap in capital requirements to 22%, from 40% in the 2016 review. Banks will be doing their own assessment on the rules' effects over the coming months.

Including NMRFs, the totality of the changes envisioned would bring the average expected increase in capital requirement under the rules down to 22% – far less than the 40% foreseen under the original 2016 version of FRTB.

"There are many changes to NMRFs that will reduce the capital impact dramatically," says Eduardo Epperlein, global head of risk methodology at Nomura in London. "The NMRF framework hopefully will generate a much more credible number in terms of size of capital for illiquid positions."

There were other elements that gladdened banks: the manner in which risk factors are aggregated, and in which capital requirements ratchet up as a consequence, has been softened. In addition, a common stress period can now be used for risk factors belonging to a single risk class, rather than the worst period for each individual factor. Lastly, the liquidity horizon for stress-testing NMRFs has been shortened to a minimum of 20 days, while a maximum time limit has been prescribed by the Basel Committee for each risk class.

Banks caution they need more time to digest the changes, and gauge their impact on their business mix in the coming months. And, while FRTB is scheduled to go live on January 1, 2022, no-one is quite certain whether there will be more iterations of it between now and then.

Some warn, however, that the reduction in capital increase figure is based on old data, and new numbers could change it.

"As firms grapple with what these rules mean, it's important that people assess the true impact versus the 22% Basel has assessed," says an FRTB expert at a global bank. "I feel Basel will listen if the number ends up different than that 22%."

The revisions are the latest in a torturous process begun with the launch of FRTB in 2012, and they might not be the last. After seven years, the framework has become unwieldy and may need revisiting, William Coen, secretary-general of the Basel Committee, said in a podcast earlier this month: "The finalised market risk rules continue to be quite complex ... Time will tell whether or not we delivered on all those three aspects – the risk

sensitivity, the simplicity and the comparability ... We'll continue to evaluate market risk rules as well as other new standards."

Market participants are looking to the semi-annual impact study, based on data banks report to the committee, to clarify what they would still like to see changed in the FRTB before it goes into effect in just under three years.

"We'd like that to be used to see where unintended consequences have arisen," says the FRTB expert. "That might mean tweaks to the finalised frameworks."

More to model, internally

Still, the 2019 revisions have put a new sheen on internal models. In the 2018 consultation, the committee proposed a number of revisions to the standardised approach designed to significantly lower the capital impact of the 2016 version. For example, risk weights for equity trading would have been reduced (although this proposal was not adopted in the 2019 revisions). For internal models, it included changes to the profit and loss attribution (PLA) test, but did not include major alterations to NMRFs. The net effect was to tilt the balance away from internal models and towards standardised.

But with the 2019 revisions, the balance has shifted back.

"They've significantly reduced the capital that results from NMRFs. This has the effect of making it easier for banks to make the case for the IMA," says Daniel Mayer, senior manager at Deloitte in London. "However, the implementation effort is still significant."

Crucially, the latest revisions change the formula for capitalising NMRFs so risk factors for equities, credit and other asset classes can now be aggregated in a non-correlated fashion. Banks will be allowed to assume a zero correlation for equities and credit products, and a 0.6 correlation for all other risk classes.

That new formula is expected to significantly reduce the amount of capital needed to back NMRFs. It calculates stressed expected shortfall – the average potential loss amount for losses that exceed value-at-risk at a 97.5% confidence level –

by summing the squares of the expected shortfalls for all risk factors in equities, credit, rates, foreign exchange and commodities, then taking the square root of the total.

Under the 2016 version of FRTB, there was no diversification benefit for asset classes other than credit. Risk factors had to be aggregated in a purely additive way. In other words, extreme movements in one risk factor had to be added directly to extreme movements in another risk factor. This led to overly conservative assumptions of required capital for NMRFs, the Basel Committee said.

One international bank made a rough estimate that its market risk capital would have risen three to four times under the 2016 standard. By being able to recognise correlations, though, its capital would stay about where it is today, says the bank's programme director for FRTB.

"With the latest text, you can now identify correlation for both equities and credit risk factors. That is a big change," he says. "Without being able to identify those correlations, the capital impact could have been punitive to the point of us avoiding the IMA."

Senior market risk executives say providing a diversification benefit for equities was the most significant change to the NMRF regime.

"They now allow aggregation of idiosyncratic NMRFs in equity risk factors using square root of sum of squares, provided you pass certain statistical tests," says Hany Farag, head of modelling and methodology at CIBC in Toronto. "They've always had it for credit, but having it for equities provides another avenue to reduce capital impact."

The criteria for NMRFs has been relaxed to permit four price observations in 90 days, or 100 observations in the previous 12 months. The 2016 version of FRTB permitted a maximum 30-day gap between observations for a risk factor to be deemed modellable. By expanding timelines, the new criteria make it easier for banks to include in internal models risk factors for products that trade on a seasonal basis, such as agricultural commodities.

"Under the prior rules, you couldn't have a gap between observations that was greater than one month," says the head of market risk measurement at Scotiabank. "By allowing four observations within any 90-day window, the rules have partially addressed industry concerns around seasonality."

The new rules also include a set of principles that need to be applied beyond the four-in-90-day price observations to determine whether or not a risk factor is modellable. For example, if data can't be derived from real price observations, the bank must prove its data is "reasonably representative" of prices.

The principles, which had been included as an

appendix in the 2018 consultation, were moved into the main body of the 2019 version. Banks have seen this as a signal that the committee understands that more qualitative variables need to be weighed to determine what an NMRF is than a blunt test based solely on real price observations.

The principles would only cover factors that pass the risk factor eligibility test (RFET), which separates the modellable from the non-modellable. To pass the test, a risk factor must have a sufficient number of price observations; otherwise, it must be classified as an NMRF.

Some wanted the committee to go further by making the principles an alternative for determining eligibility, so that a factor that failed the RFET could still be deemed modellable if it satisfied the principles. This would have allowed banks to apply independent price verification techniques, such as using information contained in collateral exchanged with counterparties to derive implied prices.

"We've done a lot of work to improve the independent price verification process for hard-to-value positions. We would like NMRFs to move in the direction of using more data sources," says the FRTB expert at the global bank.

Risk factor aggregation

Banks may group risk factors that can be represented as curves, surfaces or cubes into buckets for the purpose of passing the RFET, which determines whether a risk factor is modellable. This feature enables banks to calculate the stressed expected shortfall for the collection of NMRFs from the curve or surface that lays within each bucket using a single stress scenario.

This leads to the curve or surface being divided into sections. Within each section, the risk factors can be stress-tested together.

There's a caveat, though – the buckets must correspond to those used in the PLA test, which determines whether a bank's models qualify for the internal approach.

Banks can choose to create buckets with very few risk factors, but this would make it more difficult to pass the PLA test.

In a footnote, the committee explains: "The requirement to use the same buckets or segmentation of risk factors for the PLA test and the RFET recognises that there is a trade-off in determining buckets for an expected shortfall model. The use of more granular buckets may facilitate a trading desk's success in meeting the requirements of the PLA test, but additional granularity may challenge a bank's ability to source a sufficient number of real observed prices per bucket to satisfy the RFET."

The footnote adds that banks need to consider this trade-off when designing their expected shortfall models.

An FRTB expert at a global bank says: "When you're trying to figure out what an NMRF is, you have to bucket the various risk factors that you've identified from all the positions you've got. That allows you to group risk factors together in ways that reflect how you see things from a risk management perspective. We are looking at that closely."

In other words, more granularity means more accuracy in a model, which improves the chances of meeting the PLA requirements. But having more granular buckets requires more price observations to pass the RFET.

In calculating capital for NMRFs, the 2019 revision also allows banks to limit liquidity horizons, or the time required to exit a position under stressed conditions without affecting market prices, at a level prescribed by the committee for the different risk factors, with a minimum of 20 days.

This is a relaxation of the 2016 standard, which set the liquidity horizon for each NMRF at the greater of the longest interval between two consecutive price observations in the prior year and the committee-prescribed liquidity horizon. For highly illiquid positions, this could mean liquidity horizons of three months or longer.

"Previously, when we were calibrating for the stressed expected shortfall on NMRFs, you'd have to use the gap of observable liquidity," says the FRTB programme director at the international bank. "So your NMRF could have a gap of six months between real prices, and that is what you'd have to use in the stressed expected shortfall. Now that is capped to the liquidity horizon for the class of risk factor you are looking at."

Significantly, banks are now permitted to use a common stress period for all factors relevant to a particular set of risks. Previously, they had to use the very worst stress period for each risk factor, which could mean using data going back to the financial crisis. For example, banks can bracket interest rates together and use a single stress period. This makes the stressed expected shortfall calculation much easier.

A senior risk modelling expert at a large European bank notes: "We can use common stress periods for risk factors in the same risk factor class. This is particularly good because it reduces the operational burden of calculating the charge." ■

Previously published on Risk.net

Final internal model rules get mixed reviews

Bankers divided on whether changes to two key tests will ease 'penal' capital charges. By Samuel Wilkes and Nazneen Sherif



The BIS, home to the Basel Committee on Banking Supervision

The Basel Committee on Banking Supervision has lowered the hurdles for two key modelling tests in its market risk capital standards. But bankers are divided on how far the final amendments will improve FRTB, with some warning that a failure to fully take onboard industry criticism will still make certain aspects of the tests too difficult to pass.

"We welcome the Basel Committee's revisions of the FRTB standards, particularly on non-modellable risk factors (NMRF) and the profit and loss attribution (PLA) test, which were key areas of focus during the consultation phase," says Panayiotis Dionysopoulos, head of capital at the International Swaps and Derivatives Association (Isda).

"The overall impact needs to be fully assessed, with a specific focus on areas where no changes have been made. But elsewhere, the changes appear to address many of the shortcomings of the current rules, which would have disadvantaged banks' trading book activities," he adds.

On January 14, the Basel Committee published final amendments to the 2016 FRTB standards, after reopening them for consultation in March 2018. Banks must calculate capital by either using their own internal models or a regulator-determined standardised approach (SA), with the latter generating higher capital requirements.

In the final standard, the Basel Committee has relaxed thresholds in the PLA test, which trading desks must pass to use the internal models approach (IMA), as well as the thresholds for a further test to prove whether risk factors are modellable. Banks had lobbied the Basel Committee to ease both tests as they would have resulted in significant increases in capital requirements, but there are divided views on where the final version has landed.

"It is a welcome improvement, but is far from what the industry was hoping for," says a senior modelling expert at a global investment bank.

The PLA test measures the accuracy of risk model estimates of P&L across trading desks. In the 2016 version of FRTB, if a desk failed the test, it was immediately switched from the IMA to the SA. The Basel Committee's consultation paper, published in March last year, introduced an "amber zone" to act as an intermediate phase, with capital for a desk in the amber zone still calculated under the IMA but with a surcharge.

Initial findings from banks suggested the amber zone would be "almost useless" in acting as an intermediate phase, because slight perturbations in good models caused desks to jump straight from the green to the red zone in two of the statistical approaches being considered for the PLA test: the Kolmogorov-Smirnov (KS) method and the Chi X method. The behaviour was also observed in a third method, the Spearman correlation, to a lesser extent.

Industry associations including Isda and the Global Financial Markets Association urged the Basel Committee to reset the thresholds after assessing the new methods using data from real trading desks.

In the end, the Basel Committee has chosen to drop the Chi X method and use only the KS method for determining the distance between the P&L values of the front-office pricing and risk models. The Spearman correlation method will be used to determine whether the P&L values of the front-office pricing and risk models move in the same direction.

Wider parameters

Parameters for the amber zone in both the KS and Spearman correlation methods have been pushed back and widened.

"It is a very good outcome with the calibration of the zones in the PLA test," says Adolfo Montoro, director in the market risk management and risk methodology team at Deutsche Bank. "The thresholds have been loosened. In our paper we put forward a solid analytical business case to increase the zones' thresholds slightly more, but I think they have extended quite materially. They have expanded the size of the green zone and materially expanded the amber zone, increasing the PLA leniency."

The senior modelling expert recognises the new parameters are an improvement, but says they fall short of what the industry had been hoping for, which was for the amber zone to be set roughly where the new red zone starts (see figure 1).

A capital manager at a UK investment bank says the final calibration appears "penal", but notes he is still undertaking assessments of the new parameters. "Though the thresholds have been fixed for PLA, it remains unclear whether the tests will be effective and see desks passing."

"It will be very important to observe [changes to the amber zone parameters] in practice – once banks have built their models – to see if the calibration is accurate," says an industry source. "This is an area where we believe final calibrations can only be made after we have seen the data."

Seasonal changes

A second test in the IMA, used to determine whether banks can sufficiently model risk factors, has also been dialled back. Risk factors deemed NMRF in this test must be capitalised separately with a stressed capital surcharge.

The previous framework required banks to have at least 24 real price observations of a risk factor over a 12-month period, with no longer than a one-month gap between two observations.

Banks have long complained that the seasonal nature of trading meant a high number of risk factors would be classed as NMRFs due to there being gaps of longer than a month in trading activity, which would subsequently increase bank capital under the IMA.

Now banks can select one of two criteria to assess whether a risk factor is modellable. The first requires banks to have at least 24 real observable prices over 12 months, with no 90-day period having fewer than four observations.

1. Parameters of PLA test			
	March 2018 consultation paper	Industry requests	Final January 2019 paper
Spearman correlation method			
Amber zone	0.825	0.75	0.8
Red zone	0.75	0.65	0.7
Kolmogorov-Smirnov method			
Amber zone	0.083	0.11	0.09
Red zone	0.095	0.125	0.12

Source: Basel Committee on Banking Supervision, industry sources

"It is a very good outcome with the calibration of the zones in the PLA test"

Adolfo Montoro, Deutsche Bank

If a risk factor is unable to meet those requirements, banks can still model the risk factor if it has a total of 100 real price observations over 12 months. The response of bankers towards the changes is varied.

"We think the 100 observations, but more particularly the 24 and four-in-90 observations, will make a big difference to modellability, which is positive and helpful," says the capital manager at a UK investment bank.

Four observations over a period of 90 days would allow for a longer window of time between two separate observations. A consultant working at a European bank says: "We believe a lot of risk factors that used to be considered potentially non-modellable will become [modellable] with these new criteria."

But the senior modelling expert at the global investment bank says the changes will not resolve the problem of seasonality. Industry associations and several investment banks have recommended using the approach laid out in the first criteria, but with three observations over the 90-day period.

"We didn't expect it to solve much, but we did expect some flexibility before the standard was published," says the senior modelling expert. "I think this is an attempt to avoid people saying the one-month gap is causing the issues, whilst not dropping the original standard. It will address seasonality for only a few cases."

The senior modelling expert believes the second test will only relieve the seasonality problem for the most liquid risk factors and is therefore too high a bar.

"The 100 observations is a form of addressing seasonality in liquid risk factors, but it is an extreme one. The Basel Committee has basically gone, 'Fine, [if] you think that [risk factor] is liquid, then show it.' But 100 seems dramatic – it should be more than 24, but not [so] much bigger," the expert adds.

Insufficient evidence

The senior modelling expert believes the Basel Committee did not go further in alleviating the seasonality issue because the standard-setter says it didn't receive much evidence to support industry claims.

"It has been really challenging for the industry to pull together compelling evidence on the risk factor eligibility test," says Jacob Rank-Broadley, a director at technology vendor Refinitiv. "The industry was basically being asked to get a huge breath of data, boil it down and then run some relatively simple tests. It is much easier to do that in relatively small quantities. It is also quite difficult when a lack of data is your problem to evidence a lack of data objectively. Apart from saying 'we are struggling to find that'."

The Basel Committee has also inserted a rule within both criteria for passing the modellability test that no two observations should be from the same day. The intention is to avoid banks potentially gaming the test.

"We got some questions from some of our clients saying, 'Can I have 13 observations on one day and then one observation per month and still pass?'" says Rank-Broadley. "Technically, with the old rule, you would have been able to pass. We didn't find the scenarios existed in reality. All of those hypothetical scenarios just didn't come up very often."

Rank-Broadley says eliminating this loophole is a useful step, because banks might otherwise have explored whether they could use it, before finding out there was no benefit in doing so, given that the scenario is so rare. ■

Previously published on Risk.net

Standardised approaches lose out in FRTB update

Ratio of standardised approach to internal models approach capital estimated to increase. By Louie Woodall

Amendments to the Basel Committee on Banking Supervision's revised market risk framework would widen the gap between dealers using the internal models approach (IMA) and the standardised approach (SA), according to the standard-setters' impact analysis.

The Basel Committee published revisions to FRTB on January 14 to address issues raised with the 2016 iteration.¹

Though the Basel Committee's own impact analysis predicts a lower weighted average capital uplift on existing requirements overall under the updated version than the initial proposal, of 22% down from 40%, those firms that use SAs could find themselves at a bigger disadvantage to their IMA peers than before.

Banks using the SA could see a 30% hike on current capital requirements on a weighted average basis, and those electing for the simplified SA a 57% jump, compared with a 20% increase for IMA banks.

Furthermore, the estimated capital charges under the amended SA relative to those projected under the amended IMA appear to have increased on the 2016 proposal.²

The median capital requirement for interest rate risk under the 2016 FRTB was projected to be 30% greater under the SA than the IMA. Under the 2019 FRTB, this gap has increased to 50%. For equity risk, the excess has grown to 80% from 20%; commodity risk to 60% from 50%, and foreign exchange risk to 220% from 120%. The credit risk excess was projected to fall to 10% from 20%.

The Basel Committee said the impact analysis for the forex risk class is predicted to be lower in practice than the estimate suggests, as this does not incorporate all amendments included in the update. The number of banks included in the 2019 impact analysis sample is also larger than that for the 2016 exercise.

What is it?

FRTB represents an overhaul of a market risk capital framework first developed in 1996. The Basel Committee is seeking to plug the holes in the regime that became apparent during the financial crisis. The updated framework reinforces the divide between trading and banking books, shakes up the approval process for internal models and provides a more risk-sensitive SA.

The first iteration of the revised framework was published in January 2016 with an implementation date of January 2019. In December 2017, with the publication of the complete Basel III set of reforms, the go-live date was pushed back to January 2022.

In March 2018, the committee issued a consultation with proposed improvements to the framework in response to industry concerns.

The January 14 publication includes the tweaks to FRTB the committee has endorsed following this consultation.



Why it matters

Although the Basel Committee branded this latest FRTB package as simply including “refinements and clarifications”, almost every aspect of the framework has been altered one way or another.

The SA has been revised with new risk weights for interest rate, forex and certain credit spread exposures. A new simplified SA, first floated in 2017, has also been formally adopted.

For IMA firms, changes include an overhaul of the process for approving the use of an internal model to capture the risks of individual trading desks – known as the profit and loss attribution (PLA) test – and a new approach to defining and capitalising for non-modellable risk factors (NMRF).

Both were particular industry bugbears. A 2016 study estimated NMRFs could account for up to 30% of an IMA firm’s total market risk capital requirement. The complexity of the PLA test, meanwhile, threatened to push individual trading desks off the IMA approach and onto the SA, producing unwanted volatility in capital requirements.

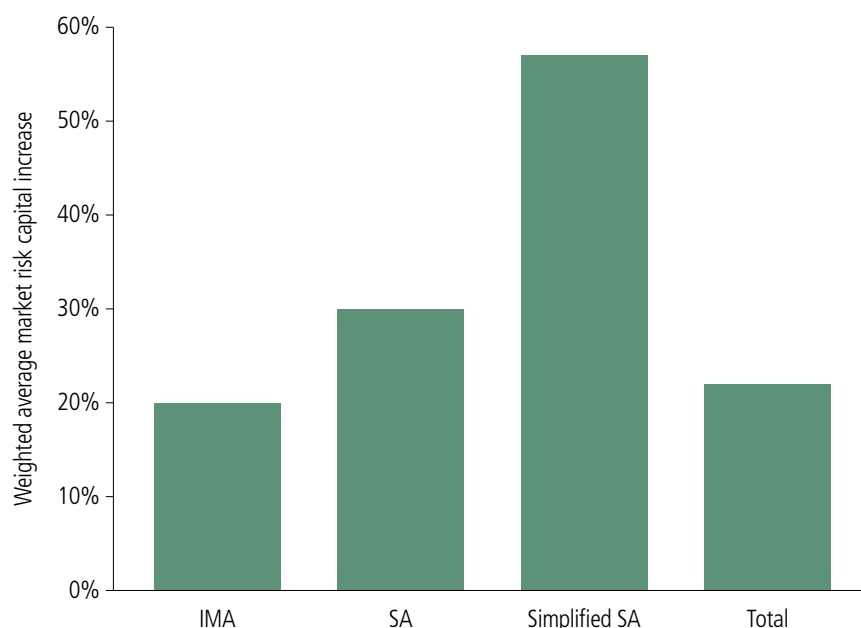
In fact, the problems with the initial IMA were such that some of the banks it was allegedly designed for favoured the SA route instead.

Whether the changes encourage banks that had spurned the IMA to give it another look, and take the lower capital increases in the bargain, is a big question. However, if the ratio of SA to IMA capital charges have increased under the amended framework, as suggested in the latest impact analysis, it may make getting to an answer that bit easier. ■

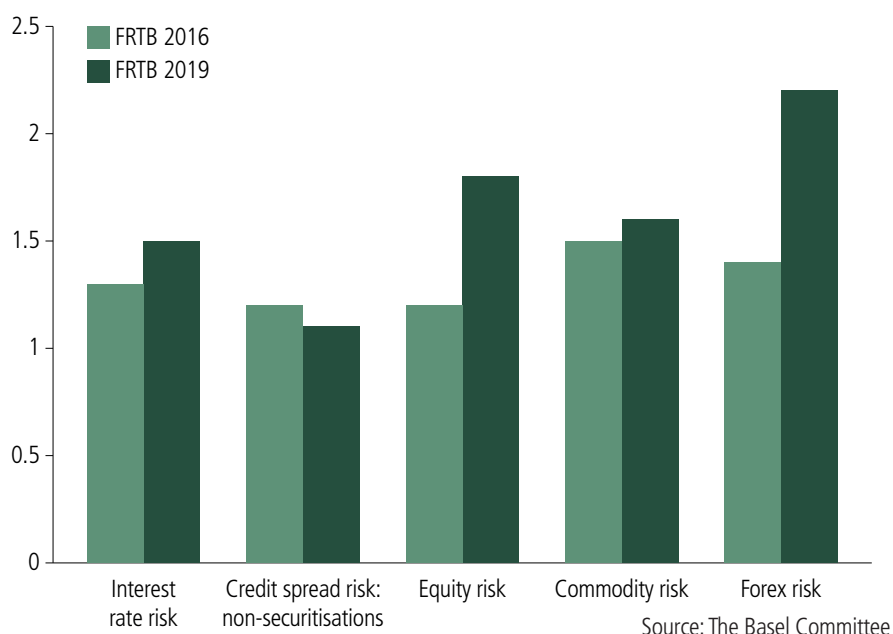
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1. Estimated changes to market risk capital framework under amended FRTB compared with Basel 2.5



2. Ratio of market risk capital requirements under the SA relative to capital requirements under the IMA



¹ Basel Committee on Banking Supervision (BCBS), Bank for International Settlements (BIS), Explanatory note on the minimum capital requirements for market risk, January 2019, <https://bit.ly/2Ydx6Qk>

² BCBS, BIS, Explanatory note on the minimum capital requirements for market risk, January 2016, <https://bit.ly/2LDB5n2>

Get in touch

Has FRTB been redeemed through the latest update, or do its flaws persist? Give us your take by emailing louie.woodall@infopro-digital.com, tweeting @LouieWoodall, or via LinkedIn. Keep up with the Quantum team by following @RiskQuantum.

Final FRTB tweak ‘will kill correlation trading’

Some European banks plan to lobby the European Central Bank for relief when rules are transposed to local law. By Nazneen Sherif

Changes to market risk rules are threatening to drive up capital charges for correlation trading desks, and may force dealers to rethink hedging methods or close down the business altogether.

The latest version of FRTB, finalised in January, prevents banks from offsetting credit default swap (CDS) indexes against their single-name constituents. Credit correlation trades depend on arbitraging these two components.

European banks are now hoping to persuade local lawmakers to provide a carve-out from the restrictions when FRTB is transposed into national law.

“We will have discussions with the European Central Bank on European transpositions,” says a senior trader at a European bank. “If we can’t get [relief] then we have to assess the cost of different hedging [strategies].”

The trader explains that the bank will explore capital optimisation to reduce costs in an attempt to make the activity sustainable. “If we cannot get good results, we need to think about deleveraging the business and potentially closing it,” the trader adds.

The European bank has asked the International Swaps and Derivatives Association (Isda) to pressure the Basel Committee to release a statement clarifying the capital treatment of correlation trading portfolios, the trader says. The bank is also in discussions with the European Banking Federation over developing a solution with the region’s lawmakers.

Isda declined to comment for this article.

Sense and sensitivity

Credit correlation traders sell CDS indexes, such as CDX or iTraxx, and buy offsetting single-name swaps, or vice versa, if they believe the spreads are out of line. Since an index is strongly correlated to its constituents, when this relationship weakens, investors can put on a trade to make money in anticipation of the correlation correcting itself.

The FRTB’s standardised approach (SA) measures the sensitivity of trades to specific risk factors. Trading activity is split across seven broad classes of risk, for example rates, credit and equity. Within each class, trades are placed a range of buckets that share common characteristics.

In the credit risk class, single-name CDS trades go into a bucket based on the credit risk of the underlying – for example, high yield or investment

grade. Indexes have their own separate bucket. The risk sensitivities are aggregated within these buckets, and then across different buckets to arrive at the capital requirement for each class of risk.

In some cases, risk sensitivities across buckets are allowed to net, and in some cases they aren’t. Before the final version of FRTB was published, sensitivities of trades on indexes were allowed to net with those of single names under certain conditions. Dealers assumed this so-called look-through approach applied to correlation trading, and earlier drafts did not explicitly exclude these portfolios from netting.

However, the latest rules specifically bar the netting of indexes versus single names for correlation trading portfolios.

A risk manager at a second large bank says: “There was a change in the final rule which went from bad to worse in terms of the decomposition of index positions. You are not allowed to do that in the same way for correlation trading as you are for other products.”

The earliest versions of FRTB were also tough on correlation trading, as the framework does not allow banks to use their own models for this portfolio, which could result in lower capital charges. Instead, they are relegated to the regulator-set SA. But market participants say the latest revisions have made FRTB even more punitive.

“It just continues the theme of regulators being ultra-conservative when it comes to this particular portfolio,” the risk manager says.

Some market participants worry that the final text will ultimately kill off the correlation trading business.

“The impact is really huge. If you interpret word by word, as the text is explaining, and take the most punitive approach, it’s an activity killer,” says Ichak Koutchoukali, director at consultancy Axis Alternatives in Paris. “That’s a shame, because the way it is written it is the complete opposite of how the business works and how traders hedge their portfolios.”

A workaround

The latest rules do, however, throw up a potential inconsistency. Unlike positions on indexes, positions on baskets of single names can be netted against single-name hedges. This may prompt some dealers to attempt to get around the rules by trading a basket of names that is almost identical to the index. In this

way, the bank takes a position very close to the index without having to face the netting restrictions.

“If you do trade on an index and you modify the index by just one name, say it becomes bespoke, its treatment is much better,” says the senior trader at the first European bank. “Something easy we can do is to negotiate with the client about the possibility to amend one name in the basket or to reduce to only part of an index, or merge two indexes together.”

Another way of circumventing the rules is to control the maturity of transactions so that index trades with unfavourable treatment do not extend beyond FRTB’s implementation date. The rules are currently slated to go live on January 1, 2022, but this deadline may slip and the Basel Committee has not ruled out making further tweaks to the framework.

“If we manage to do transactions which are shorter term we will reduce the risk of a strong capital increase,” the trader says.

Whether or not the Basel Committee revisits the framework, dealers are hopeful national supervisors will be persuaded to amend the rules on correlation trading when FRTB is transposed to local legislation.

“We still would like it to be changed but I’m not particularly optimistic about it,” says the risk manager at the second large bank.

Although the number of participants in the market has dropped significantly since the financial crisis a decade ago, some argue correlation trading provides solid revenues for those banks that are still left standing.

“Even if there are not many players, I think it’s about 10 or 12 of them that have correlation trading, there is still quite large activity that’s providing investors with returns tailored to their risk appetite and contributing to the liquidity of the CDS markets,” says Koutchoukali.

The trader at the first European bank says the business provides attractive spreads and relatively lower credit risk, without forcing clients to post margin.

“The product allows clients to take positions with decent protection of their capital because they can buy mezzanine trades, so they don’t incur any loss in the first default,” the trader says. “I find it a little frustrating to be obliged to close something that has a real place in the product range we can offer, especially on the distribution side.” ■

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