



FRTB: Improving the Modellability of Risk Factors
Approaches to reduce capital for non-modellable risk factors

Non-Modellable Risk Factors

A brief summary

Under FRTB IMA, the capital calculation of risk factors is dependent on whether the risk factor is modellable. Insufficient data will result in more non-modellable risk factors (NMRFs), significantly increasing associated capital charges.

Risk factor modellability and NMRFs

- The modellability of risk factors is a new concept which was introduced under FRTB and is based on the liquidity of each risk factor.
- Modellability is measured using the number of 'real prices' which are available for each risk factor.
- Real prices are transaction prices from the institution itself, verifiable prices for transactions between arms-length parties, prices from committed quotes, and prices from third party vendors.
- For a risk factor to be classed as modellable, it must have a minimum of 24 real prices per year, no 90-day period with less than four prices, and a minimum of 100 real prices in the last 12 months (with a maximum of one real price per day).
- The Risk Factor Eligibility Test (RFET), outlined in FRTB, is the process which determines modellability and is performed quarterly.
- The results of the RFET determine, for each risk factor, whether the capital requirements are calculated by expected shortfall or stressed scenarios.

Consequences of NMRFs for banks

- Modellable risk factors are capitalised via expected shortfall calculations which allow for diversification benefits. Conversely, capital for NMRFs is calculated via stressed scenarios which result in larger capital charges. This is due to longer liquidity horizons and more prudent assumptions used for aggregation.
- Although it is expected that a low proportion of risk factors will be classified as non-modellable, research shows that they can account for over 30% of total capital requirements.
- There are multiple techniques a bank can use to reduce the number and impact of NMRFs, including the use of external data, developing proxies, and modifying the parameterisation of risk factor curves and surfaces.
- As well as focusing on reducing the number of NMRFs, banks will also need to develop early warning systems and automated reporting infrastructure to monitor the modellability of risk factors. These tools help to track and predict modellability issues, reducing the likelihood that risk factors will fail the RFET and increase capital requirements.



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Reducing capital requirements

Banks should focus on reducing their NMRFs as they are associated with significantly higher capital charges. There are multiple approaches which can be taken to increase the likelihood that a risk factor passes the RFET and is classed as modellable.

Enhancing internal data

Increasing the amount and quality of internal data is the simplest way to reduce NMRFs, although it can be the most expensive.

The simplest way for banks to reduce NMRFs is by increasing the amount of data available to them. Augmenting internal data with external data increases the number of real prices available for the RFET and reduces the likelihood of NMRFs. Banks can purchase additional data from external data vendors and data pooling services to increase the size and quality of datasets.

It is important for banks to initially investigate their internal data and understand where the gaps are. As data providers vary in which services and information they provide, banks should not only focus on the types and quantity of data available. For example, they should also consider data integrity, user interfaces, governance, and security. Many data providers also offer FRTB-specific metadata, such as flags for RFET liquidity passes or fails.

Finally, once a data provider has been chosen, additional effort will be required to resolve discrepancies between internal and external data and ensure that the external data follows the same internal standards.

Creating risk factor proxies

Proxies are complicated to develop and require significant ongoing maintenance to ensure that they are still valid.

Proxies can be developed to reduce the number or magnitude of NMRFs, however, regulation states that their use must be limited. Proxies are developed using either statistical or rules-based approaches.

Rules-based approaches are simplistic, yet generally less accurate. They find the “closest fit” modellable risk factor using more qualitative methods, e.g. using the closest tenor on the interest rate curve. Alternatively, more accurate approaches model the relationship between the NMRF and modellable risk factors using statistical methods.

Once a proxy is determined, it is classified as modellable and only the basis between it and the NMRF is required to be capitalised using stressed scenarios.

Determining proxies can be time-consuming as it requires exploratory work with uncertain outcomes. Additional ongoing effort will also be required by validation and monitoring units to ensure the relationship holds and the regulator is satisfied.

Developing own bucketing approach

Developing a bucketing approach requires initial investigation and development, but much less ongoing maintenance than proxies.

Instead of using the prescribed bucketing approach, banks can use their own approach to maximise the number of real price observations for each risk factor.

For example, if a risk model requires a volatility surface to price, there are multiple ways this can be parametrised. One method could be to split the surface into a 5x5 grid, creating 25 buckets that would each require sufficient real price observations to be classified as modellable. Conversely, the bank could instead split the surface into a 2x2 grid, resulting in only four buckets. The same number of real price observations would then need to be allocated between significantly less buckets, decreasing the chances of a risk factor being a NMRF.

It should be noted that the choice of bucketing approach affects other aspects of FRTB. Profit and Loss Attribution (PLA) uses the same buckets of risk factors as chosen for the RFET. Increasing the number of buckets may increase the chances of passing PLA, however, also increases the likelihood of risk factors failing the RFET and being classed as NMRFs.



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