MUREX

MARCH 2023

FRTB in APAC
How Ready are Banks?
An industry survey

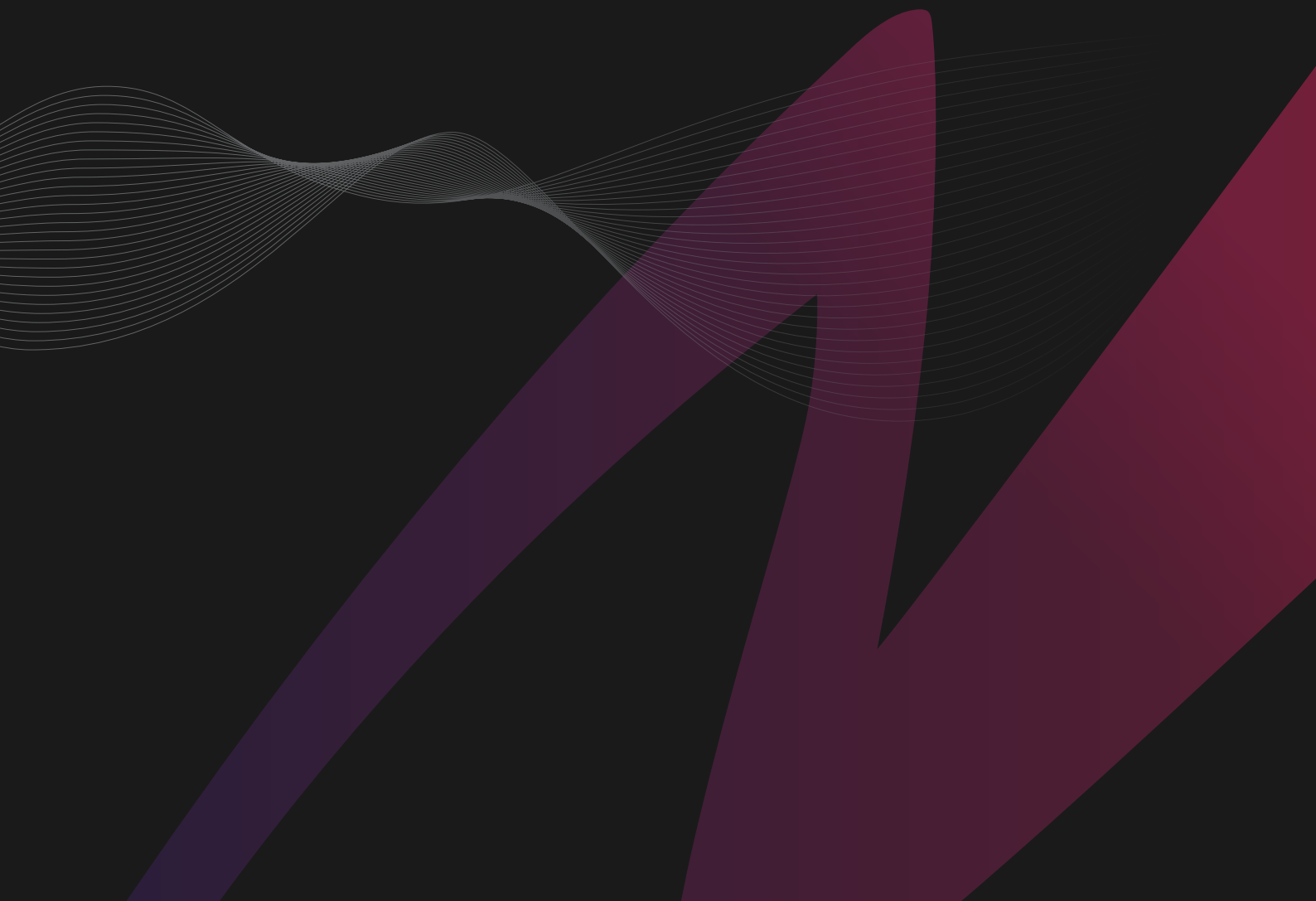


Table of Contents

EXECUTIVE SUMMARY

In Q3 2022, Murex asked 24 financial institutions in the Asia Pacific (APAC) region to share their views on business implications and implementation challenges of the upcoming market risk regulatory framework – the fundamental review of the trading book (FRTB).

These 24 institutions are headquartered in Australia, Hong Kong, India, Indonesia, Japan, Mainland China, Malaysia, Singapore, South Korea, Taiwan and Thailand. They represent different profiles, from local firms to domestic systemically important banks (D-SIB) and global systemically important banks (G-SIB).

The vast majority (92 percent) currently use the Basel 2.5 standardized approach (SA) to determine their market risk capital. The rest have implemented the VAR-based internal model approach (IMA).

The survey is composed of a questionnaire that covers five aspects—regulatory context, preparation, technology and system design, expertise and synergies. The questionnaire is accompanied by follow-up interviews. The survey results reflect only the participants' status or stated opinions on FRTB implementation as of the surveyed date.

The first finding of this survey is that **half of the respondents remained unclear about regulatory timelines in their local jurisdictions.** This reflects the wait-and-see approach by regulators in most regions. According to some survey participants, this could also be explained by local regulators being fully mobilized on credit risk and new interest rate risk in the banking book (IRRBB) guidelines, and are therefore delaying FRTB adoption.

However, it does not mean that regulators are disengaged: **62 percent of respondents confirmed they had or were planning to conduct a quantitative impact study (QIS)** as requested by the local authority. These institutions had deeply analyzed FRTB impacts on their overall organization. Respondents not yet required to complete a QIS by the time of the survey are principally in Thailand and Malaysia.

The second finding of this survey is that **half of the respondents plan to apply for IMA under FRTB, even though most of them have never implemented IMA under the Basel 2.5 framework.** Besides potential capital benefits, the approach is encouraged by some local regulators to improve risk management practices.

Nevertheless, all participants agree that the new rules, both under IMA and SA, are more punitive and will **increase their capital requirements on market risk by a factor of 1.5 to 3.**

The next part of the survey focuses on implementation costs and challenges around both FRTB approaches. While most respondents believe that **implementing SA under FRTB would take around 20 months** from system selection to approval, **data management appears to be the most challenging and costly aspect**.

Overall, half of the participants expect to leverage on-premises infrastructure to run the new regulatory rules and 30 percent consider a hybrid approach with cloud deployment. **SaaS service does not seem to be a viable option for most of them due to data security or regulatory constraints.**

Finally, the **lack of local resources or expertise is seen as the main impediment** to an efficient and secure implementation. In terms of synergies, half of the respondents consider it **critical to align the inputs and valuations between FRTB and front office risk, between FRTB and finance, and across regulatory computations.**

Looking forward, banks are rationalizing system landscapes and working hand in hand with vendor partners to tackle challenges around implementation and expertise scarcity for a smooth and timely FRTB adoption.

INTRODUCTION AND FRTB OVERVIEW

The fundamental review of the trading book (FRTB) is a comprehensive set of rules specifying the minimum capital requirements for market risk on banks' wholesale trading activities. It is developed by the Basel Committee on Banking Supervision (BCBS) as part of Basel III.

In the immediate aftermath of the global financial crisis, BCBS issued revisions to the Basel II market risk framework, also known as "Basel 2.5," to address the most urgent issues exposed by the crisis. However, these revisions did not solve the structural deficiencies of the framework. In response, BCBS initiated a fundamental review of the trading book in 2012 and published final standards in January 2019.

Uncertain regulatory timelines
Though BCBS set January 1, 2023, as the FRTB implementation deadline, the pace of adoption by local regulators has been patchy, particularly in the APAC region. Many banks are still unclear on timeframes, details and impacts of FRTB. In some jurisdictions in the region, implementations are quite advanced, and the regulators are highly engaged with banks. In other jurisdictions, regulatory consultations have not started and timeframes are still unknown.

From Basel 2.5 to FRTB: what is new?
FRTB improved the Basel 2.5 framework by introducing a clearly defined boundary between the trading and banking books, new standardized approach (FRTB-SA) and internal model approach (FRTB-IMA), as well as new supervisory tests for IMA approval at the trading desk level.

Table 1 summarizes the key changes brought by the Basel III minimum capital requirements for market risk (FRTB).

	BASEL 2.5	FRTB
Boundary between the banking book and trading book	Reliance on the bank's intent	Clearly defined boundary
Risk measurement under the standardized approach (SA)	Single Standardized Measurement Method (SMM)	Sensitivity-Based Method (SBM) Default Risk Charge (DRC) Residual Risk Add-on (RRAO)
Risk measurement under the internal model approach (IMA)	Value at Risk (VAR) Stressed Value at Risk (sVAR) Incremental Risk Charge (IRC)	Expected Shortfall (ES) Default Risk Charge (DRC) Stressed Expected Shortfall (SES)
Model approval/removal	At the bank-wise level Backtesting	At the trading desk level Backtesting P&L Attribution (PLA) test Risk Factor Eligibility Test (RFET)

Table 1: Key changes to the market risk framework under FRTB

All banks are subject to FRTB-SA. Firms may additionally opt for the FRTB-IMA, which is nevertheless floored by a certain percentage (defined by the regulator for the different phases) of FRTB-SA calculation and is subject to an output floor of 70 percent on risk-weighted assets (RWA). Trading desks failing the IMA model validation tests must revert to the standardized approach.

The current Basel 2.5 standardized approach will be retained as a simplified alternative to the revised standardized approach for banks that have relatively small or non-complex trading portfolios.

FRTB adoption: significant system, data and process changes

Under FRTB-SA, delta, vega and curvature sensitivities across all desks and asset classes are computed daily according to regulatory defined risk factors and calculation methodology. New reference data is needed to properly identify positions in scope and to map sensitivities to the adequate regulatory buckets.

FRTB-IMA introduces new processes and requires significant amounts of historical market data for both the RFET and SES computation. The classification of positions into liquidity horizon buckets within the expected shortfall calculation dramatically increases the number of computations compared to current VAR models.

The PLA test, which compare the P&L generated by front-office pricing models and the P&L generated by bank's own risk models, demands a high accuracy on the pricing models used in risk systems as well as alignment between market data sets and processed market data, such as pricing curves and volatility surfaces.

Around the globe, institutions applying for FRTB-IMA have pointed out that the new methodology could require significant investments in hardware capacity. This has also prompted some to consider cloud computing options.

On top of these new FRTB requirements, many large banks have multiple trading systems. Juggling with data feeds from several trading systems adds further complexity to producing consistent risk sensitivities, as each system will have its own market data feeds, valuation models and pricing curves, as well as trade and desk representations and end-of-day closing procedures.

Institutions that must report exposures across multiple jurisdictions will need flexibility in processes and systems design to cater to different market data sets, reporting currencies and cut-off times, as well as local interpretation or adaption of FRTB rules.

This survey focuses on the business implications of FRTB as well as implementation challenges from a modeling and IT perspective. At the time of the survey, most banks had completed quantitative impact study (QIS) exercises and had done considerable analysis of the impact of the FRTB on their organizations, in terms of enhancements to modeling, systems uplift and organizational changes. Project work has commenced in minority of banks surveyed where the FRTB framework has been adopted locally and the implementation deadlines are confirmed.

SURVEY RESULTS

Survey composition

Murex interviewed 24 banks in APAC between July and September 2022. Below charts show the survey composition by territory, bank profile and bank's current approach for market risk capital calculation under Basel 2.5.

Note that the country groups used are:

North Asia: Japan, South Korea
Greater China: Mainland China, Hong Kong, Taiwan
South Asia: India, Indonesia, Malaysia, Singapore, Thailand
Oceania: Australia

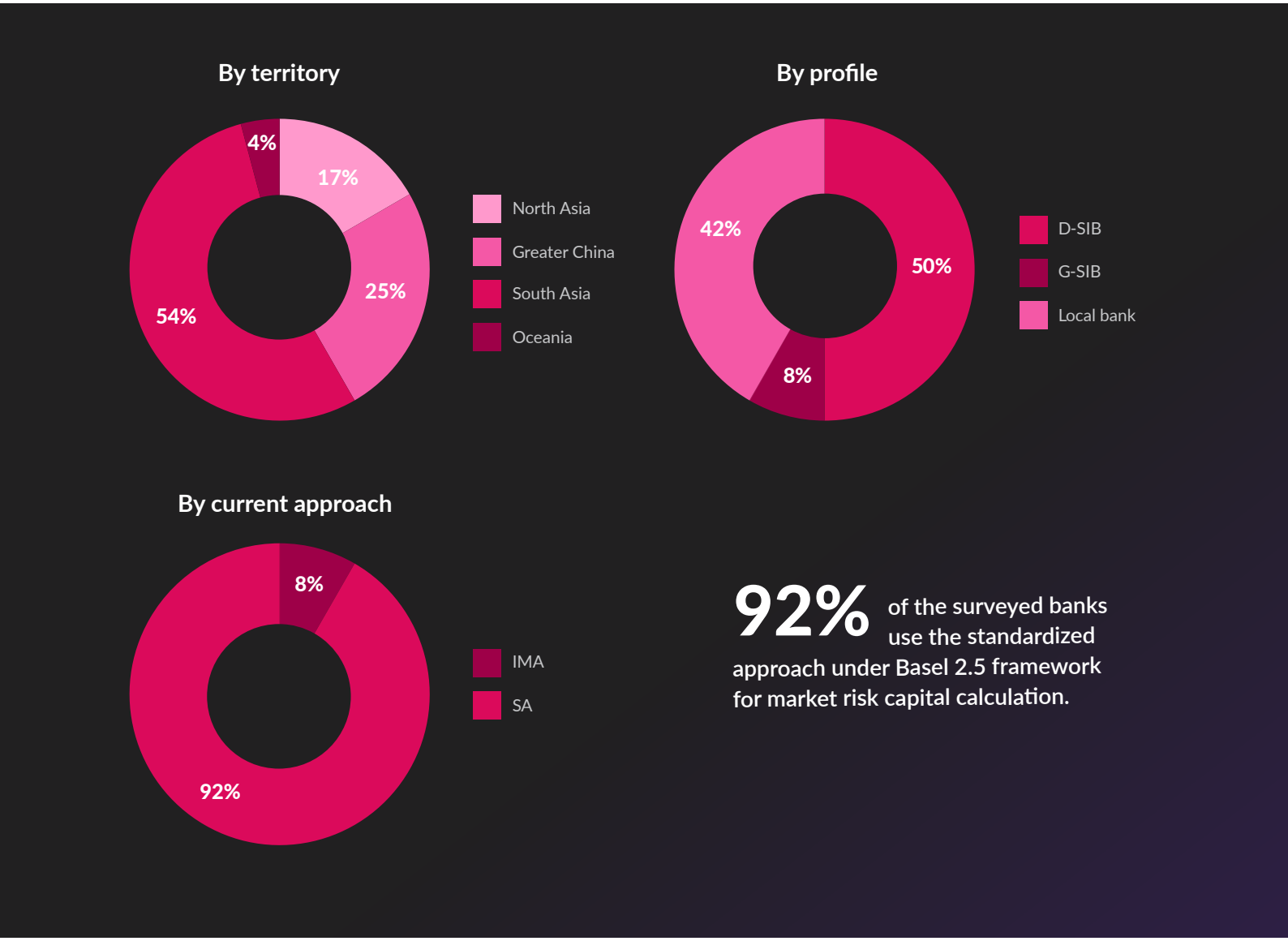


Figure 1: Survey composition

Regulatory context

EXPECTED TIMELINE

There is considerable uncertainty across the region regarding regulatory timeframes. The announced implementation timeframes vary from one jurisdiction to another and are not always perceived by the market as the final ones considering recent delays. Moreover, deadlines for FRTB implementation are often close to the official announcement of these deadlines, leaving limited time for banks to get ready.

Since the survey, several jurisdictions in the region published or updated their timelines. (For more details, refer to Appendix B, where a list of FRTB and CVA timelines for key financial jurisdictions is attached.)

Figure 2 shows banks' perceptions on final reporting timelines at the time of survey. Banks that provided responses of "uncertain" fall into two categories: either their regulator had not published the official timeline, or they doubted that the published timeline was the final one.

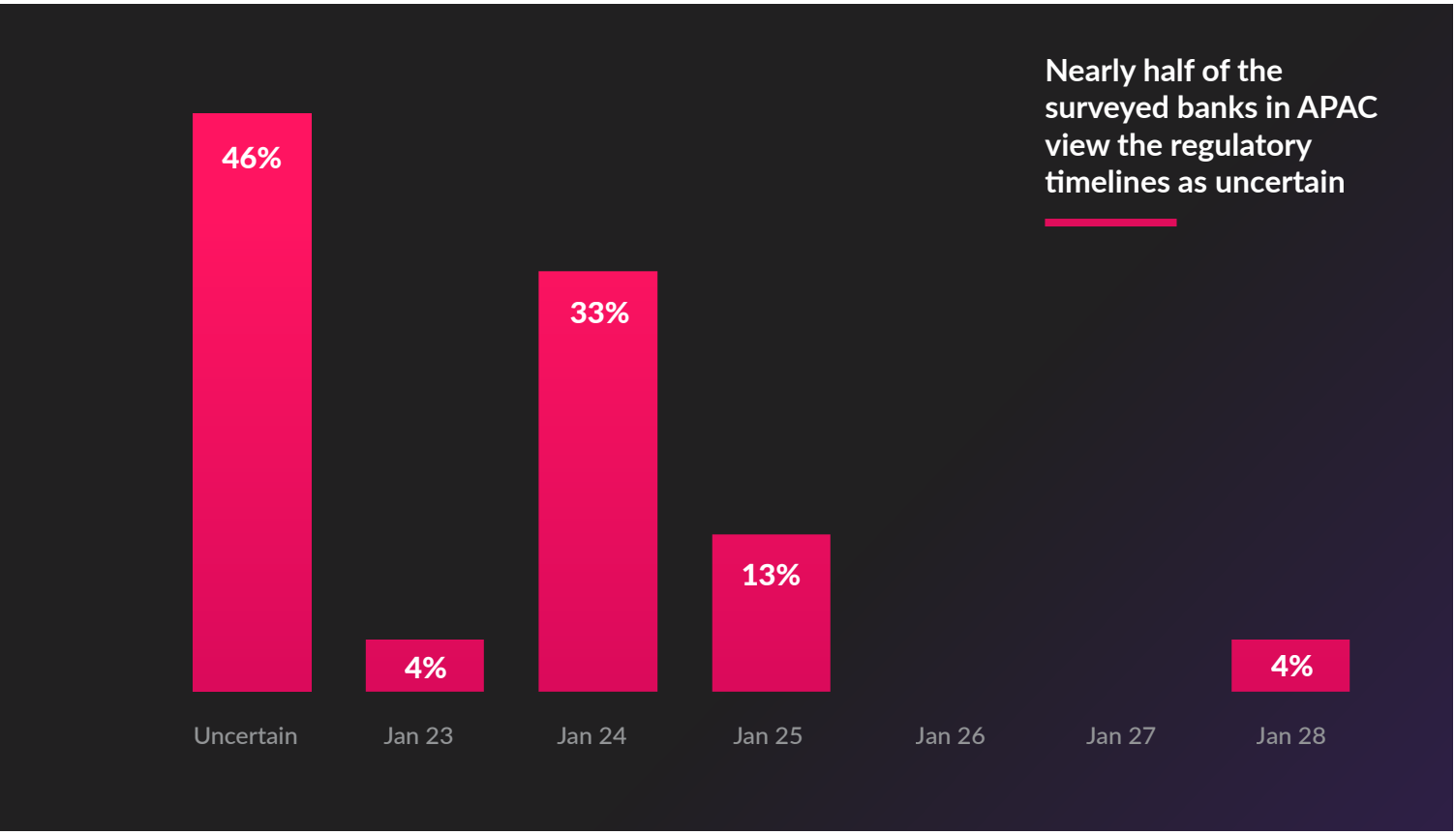


Figure 2: Expected FRTB reporting timeframe in APAC

Even within the same jurisdiction, banks' expectations on the implementation deadline diverge. In Malaysia, one bank reported that the timeframe was uncertain. Others provided estimates ranging from 2024 to 2028. Figure 3 shows the proportion of respondents that view the FRTB timeframe as "uncertain" in each jurisdiction. All respondents from India, Mainland China and Thailand replied "uncertain." (Note that at the time of the survey, Mainland China had not publicly announced the official FRTB-SA reporting deadline.)

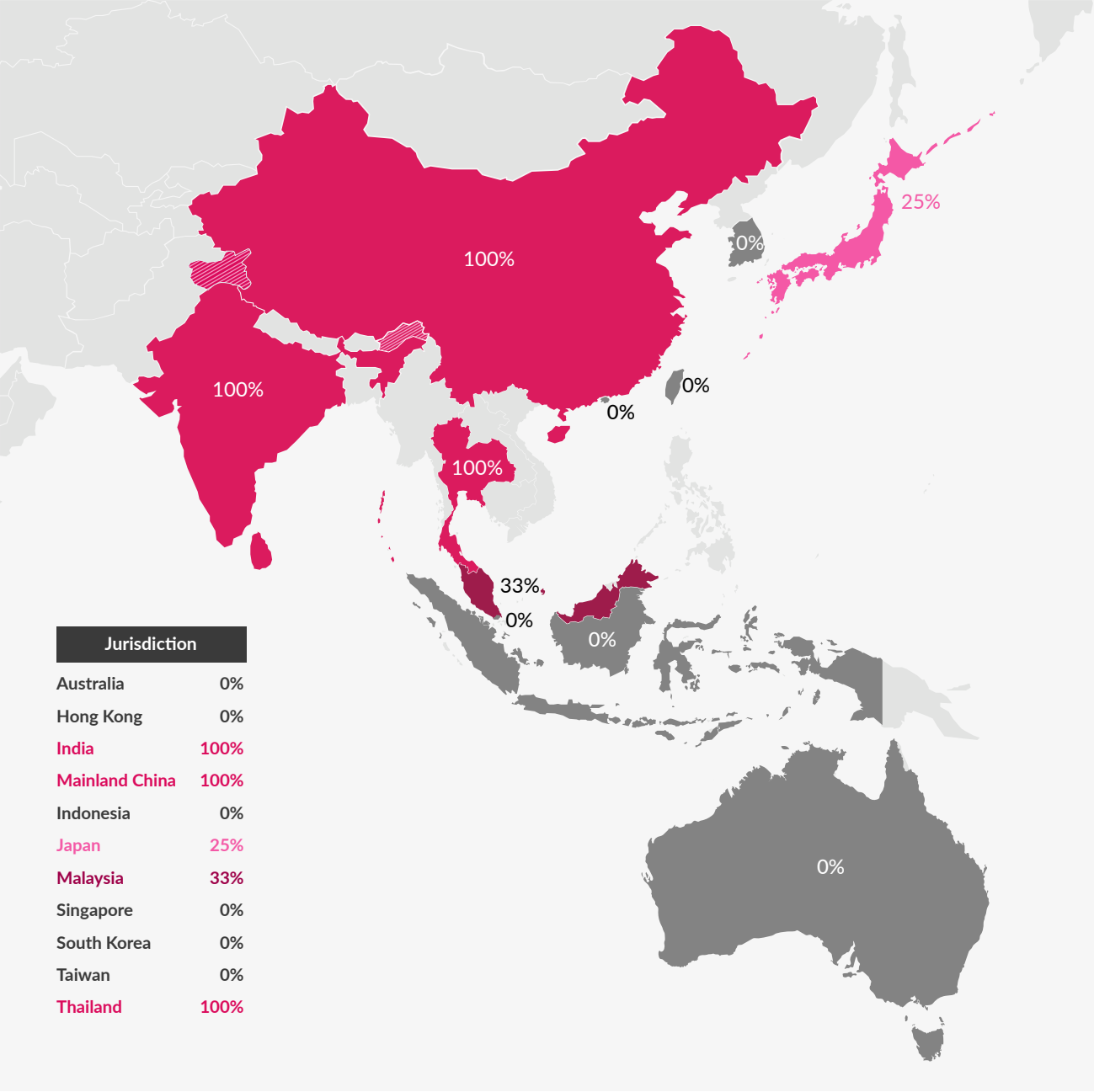


Figure 3: Proportion of local respondents who view the FRTB reporting timeframe as "uncertain"

Feedback from several surveyed banks, particularly in Australia and Thailand, indicates that regulators are heavily focusing on credit risk and IRRBB. These regulators lack the bandwidth to finalize and publish the FRTB rules and to work through the accreditation process with each bank.

ENGAGEMENT WITH REGULATORS

Despite the uncertainty on the final timelines, the survey shows a **high level of engagement between the banks and their regulatory authorities**. As illustrated by Figure 4, 75 percent of the banks surveyed indicated that their regulator had already begun FRTB rules consultation. Respondents who reported that their regulators had not begun the consultation are based in Malaysia and Thailand.

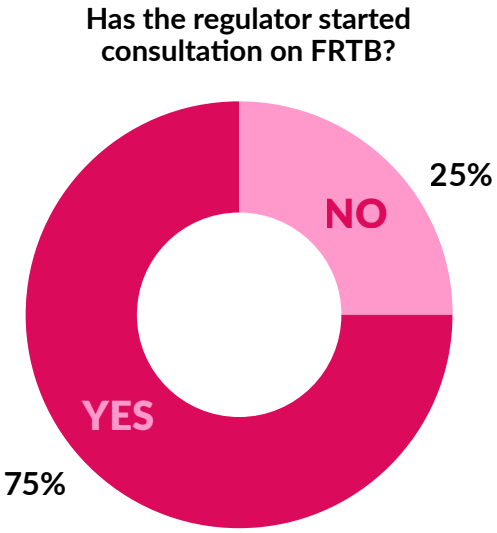


Figure 4: Status of regulatory consultations on FRTB

Figure 5 looks at the relationship between the expected timeline and banks' level of engagement with their regulator. It indicates that jurisdictions where banks report lower engagement with the supervisory authority are those where the rules are expected to be rolled out latest, or where there is high uncertainty as to the timeframe.

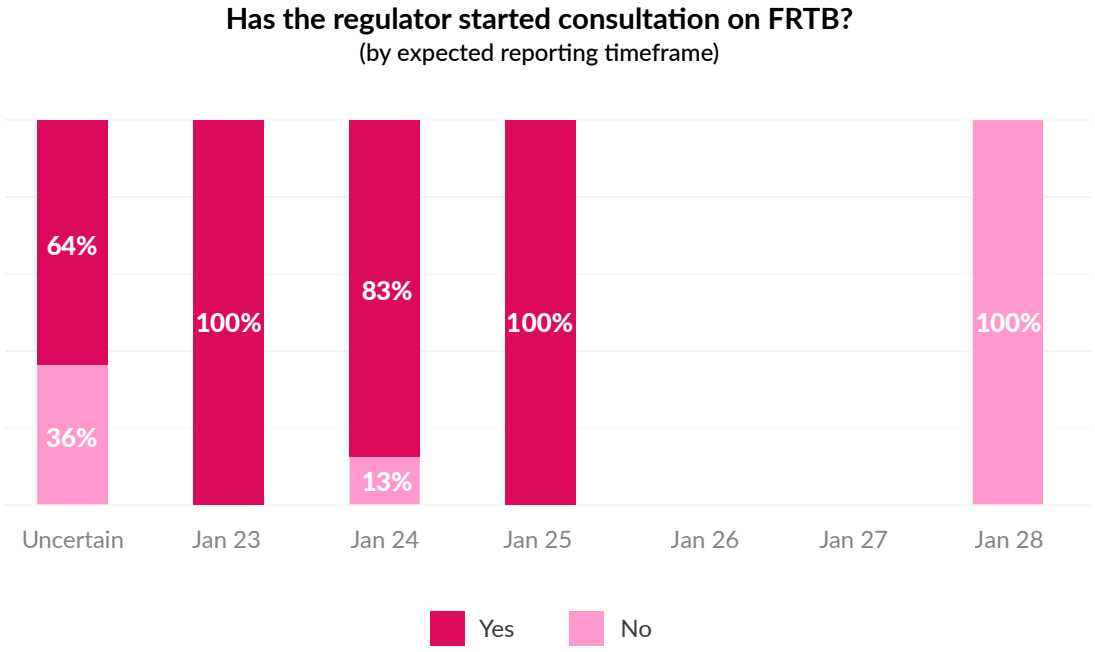


Figure 5: Status of regulatory consultations on FRTB by expected FRTB reporting timeframe

QUANTITATIVE IMPACT STUDY (QIS)

An approach that regulators commonly use to engage their supervised institutions ahead of introducing new capital rules is to request them to perform a quantitative impact study (QIS) of new rules on their portfolios. A QIS assesses potential impact of new rules on banks' minimum capital requirement and complexity of the implementation of new rules.

62%
of banks surveyed had already performed a QIS or planned to do so in the next six months.

Several banks used systems like the Murex platform, MX.3, to perform the QIS calculations. Most have done so with internally developed, Excel-based tools that will not be used for the actual implementation of FRTB.

The banks not yet required to complete a QIS are principally in Thailand and Malaysia.

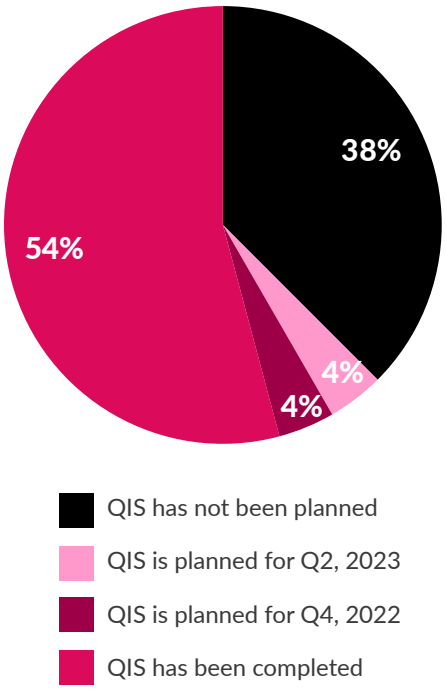


Figure 6: QIS status

Preparation

DECISION ON INTERNAL MODEL APPROACH (IMA) APPLICATION

50% target IMA under FRTB versus 8% use IMA under Basel 2.5

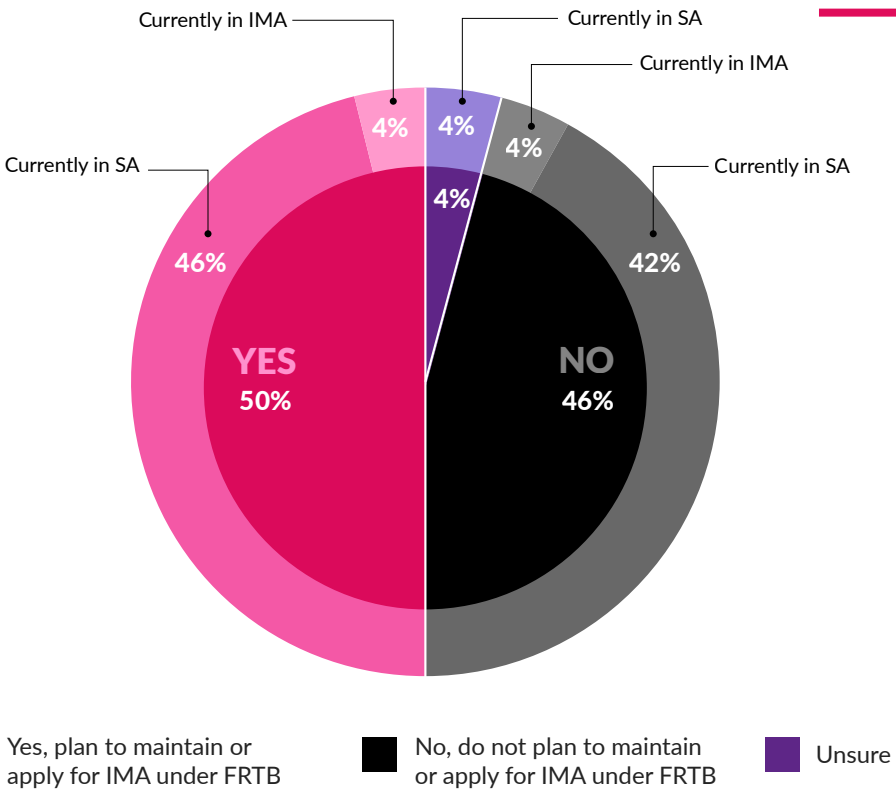


Figure 7: Whether to maintain or pursue IMA under FRTB

Feedback from survey participants reveals the following drivers for FRTB-IMA adoption:

- The expected capital benefit from IMA calculation
- The favorable regulatory context, which facilitates IMA approval
- The appetite for advanced risk management techniques

The regulatory context under FRTB is more favorable for banks seeking IMA approval. For example, under Basel 2.5, the Monetary Authority of Singapore (MAS) used to express its concern on the "all-or-nothing" approach of approval and withdrawal and has not approved any IMA application to date. Some of the banks in Singapore believe that this will change under FRTB, since, under the new framework, IMA approval is granted (or withdrawn) at trading desk level and the mandatory SA reporting serves always as an operational backstop. Hence, certain banks are already positioning themselves for a progressive IMA model approval, eventually covering all desks.

Most large Australian banks plan to maintain their IMA status for all possible desks under FRTB. They already have advanced risk management practices and commented that a move to SA would be a downgrade to these capabilities in addition to being capitally punitive. Japan-based banks seem to take a phased approach, starting with desks with the most available modellable data while taking time to learn from U.S. and European banks' FRTB implementations.

CAPITAL IMPACT ASSESSMENTS

All banks surveyed have assessed the impact of FRTB on their market risk capital requirement, either in the context of QIS or via a voluntary internal evaluation.

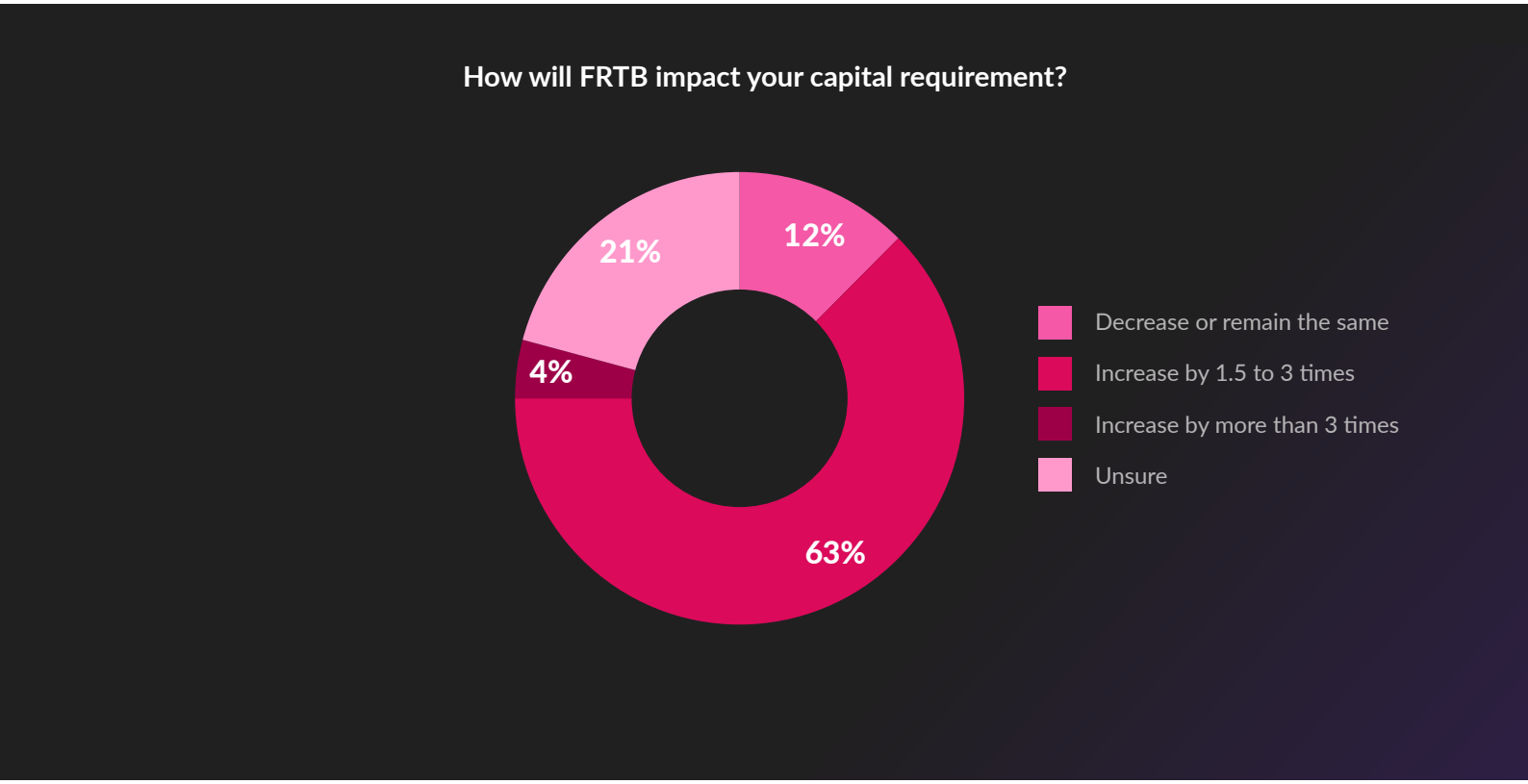


Figure 8: Estimated impact from FRTB on bank's market risk capital requirement

Most banks expect their capital requirements to increase significantly, by more than 1.5 times.
Nonetheless, several banks reported lower capital requirement under FRTB according to their internal studies. Feedback from these survey respondents indicated that capital reduction was mainly coming from longer dated products. However, the survey result might not reflect the full impact, since some internal studies were still incomplete in terms of products and calculations coverage. A few banks indicated that their studies covered only delta and vega risk charges, and excluded curvature, RRAO and DRC. They expected these charges to be not materially significant as their portfolios were mainly linear and without significant credit exposures.

Most banks identified their FX desks to be most heavily impacted, followed by interest rate derivatives.
Among the largest banks surveyed, the commodities and credit trading activities were the most impacted. This observation corresponds to the significant trading volumes of these two asset classes among the banks surveyed. (Note that this survey result is highly related to the asset classes of the largest volumes and exposure in respondents' portfolios.)

IMPLEMENTATION EFFORT AND CHALLENGES

In this section, we asked for banks' expectations on the coming FRTB implementation from two different angles: the most time-consuming process and the most challenging area.

Note that the answers might mainly reveal banks' estimation on the implementation of the FRTB-SA, even if some banks expect to pursue FRTB-IMA. This is because SA, as the mandatory approach under FRTB, attracts most attention from banks by the time of the survey.

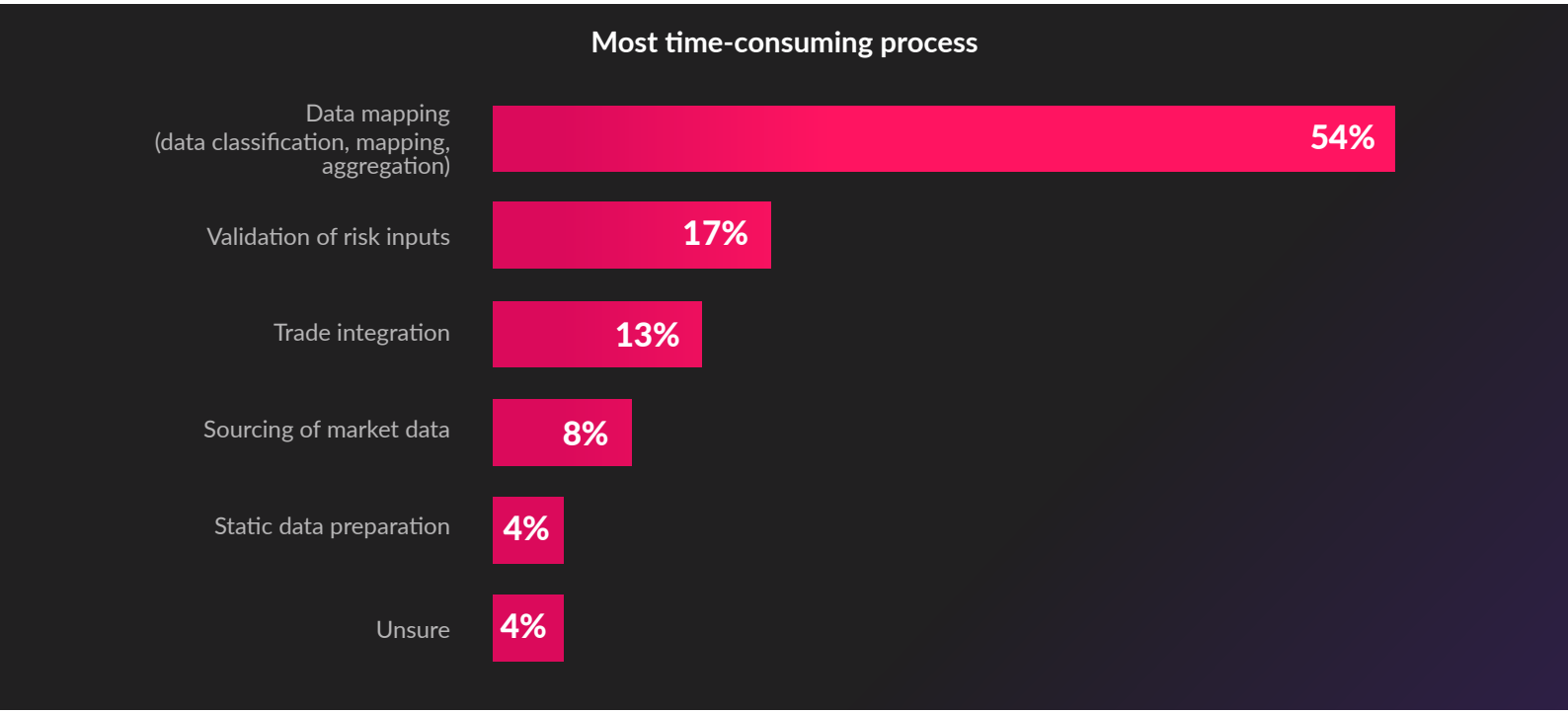


Figure 9: Most time-consuming process expected for the FRTB implementation

Data mapping is the most time-consuming process.
Under FRTB, banks need to systematically produce trade-level risk results (e.g., sensitivities, P&L vectors) and then map and aggregate them into predefined FRTB buckets. However, the required reference data is typically not well or consistently maintained in upstream trading systems where trades are stored and risk inputs are generated, making it very difficult to map the results into the FRTB buckets. Consequently, significant effort on improving data quality and granularity is often required in trading systems directly to ensure correct mapping. This effort is comparable to what was required for the uncleared margin rules (UMR) implementation, as noted by one survey respondent that had addressed the data management issue for SIMM and FRTB simultaneously.

Trade integration and risk inputs validation are less of a concern.
Trade integration from various trading systems into the risk computation engine is typically a challenging component of a risk management project. However, only 13 percent of banks surveyed highlighted it as the most time-consuming process for FRTB implementation. This may indicate that most banks believe their existing risk engine—whether it is an integrated trading and risk platform or a third-party risk system—can perform the risk computations for FRTB. Additional trade mapping is, therefore, not expected to be heavy.

Risk input validation here refers to the compliance check of the computation steps with regards to regulatory rules in each specific jurisdiction. As shown later in the technology and system design section, most respondents intended to use front office sensitivities as FRTB risk inputs, which usually have already been validated. This explains the low expected effort on risk inputs validation.

Risk inputs generation and model validations are the most challenging areas.
Figure 10 illustrated the most challenging areas expected by respondents in the coming FRTB implementation. Overall result is displayed on the right of the figure while the results split by target approach are displayed on the left and the center.

Generally, the two most important areas highlighted were the generation of risk inputs and model validation. Banks planning on IMA reported data harmonization as the biggest challenge, which can be explained by the high importance of valuation alignment between trading and risk systems required by the PLA test under IMA. Nevertheless, as IMA implementation comes probably in the second phase, some banks might only have a vague idea of the potential challenges.

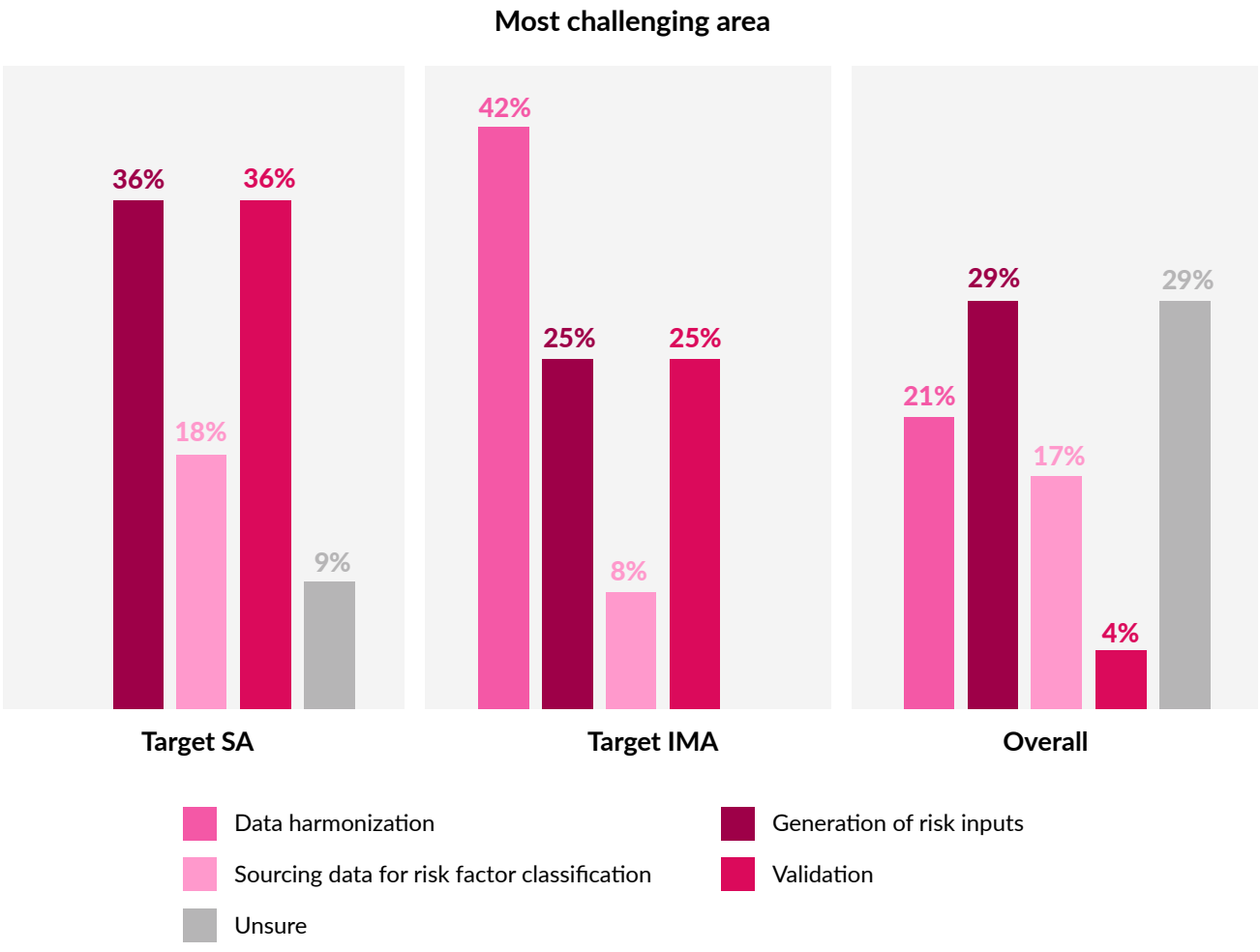


Figure 10: Most challenging area expected for the FRTB implementation

PROJECT DURATION FOR FRTB STANDARDIZED APPROACH (SA) IMPLEMENTATION

This section looks at the projected timeframe for the FRTB-SA implementation. The timeframe is divided into three phases: system selection or design, system implementation and approval.

System selection or design: over three months (67 percent)

Sixty-seven percent of banks expected to take more than three months to decide on their preferred market risk system (MRS) for FRTB-SA. However, several banks indicated that they were already very clear on their plan and expecting to decide in less than three months. These banks are either on an integrated trading and risk system or planning to source risk inputs from the front office or trading system. Therefore, they do not need to select a calculation engine.

System implementation: over six months (88 percent)

Forty-two percent of banks expected to take between six to twelve months for system implementation. Another forty-six percent expected to take longer than twelve months.

Approval: over three months (66 percent)

Banks' estimated duration for the approval phase are evenly divided. Overall, two thirds of the respondents expected to take over three months to complete the approval process.

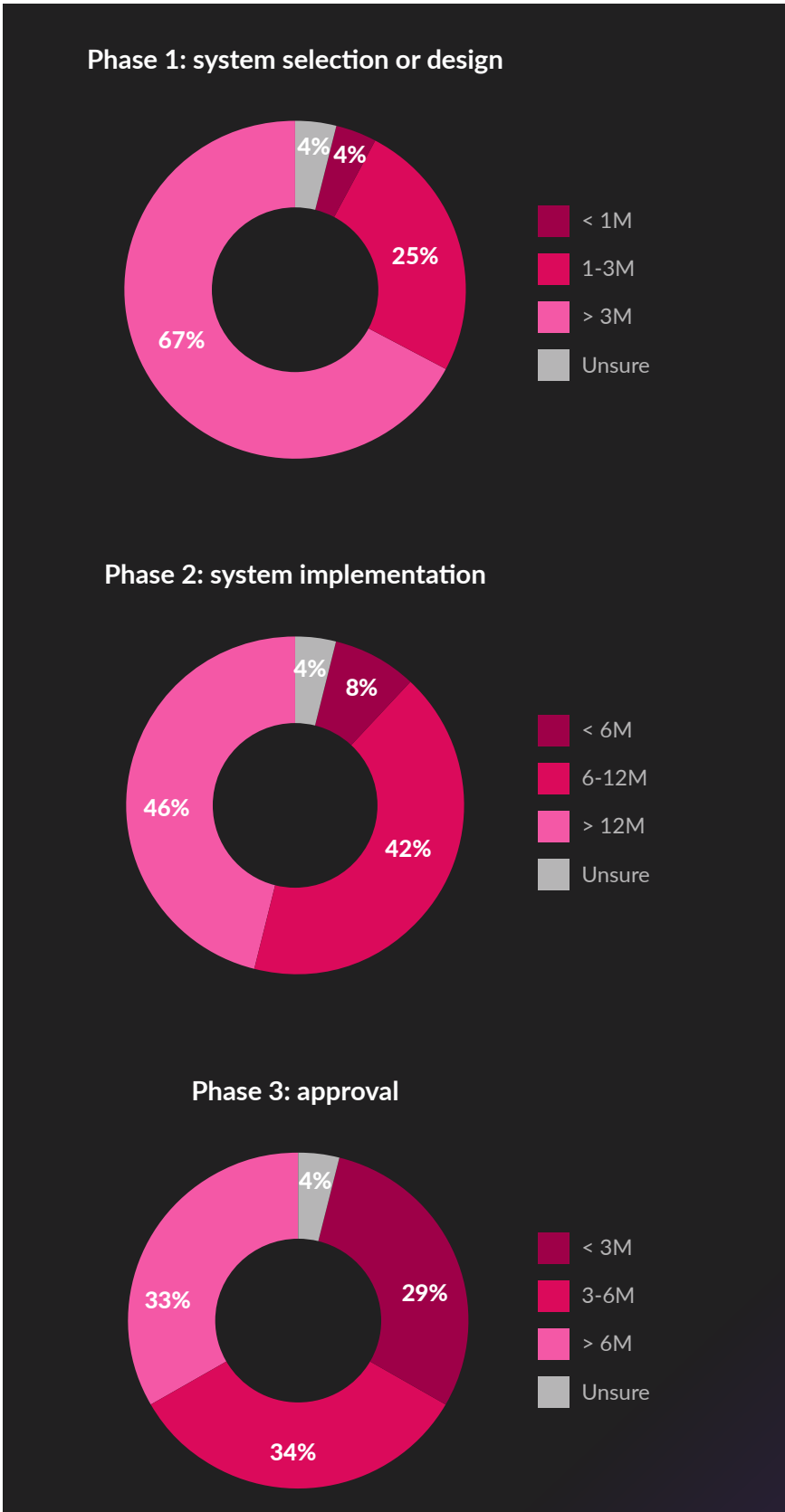


Figure 11: Estimated duration for FRTB implementation

The estimated duration for approval phase seems to be correlated to the target validation method for FRTB-SA calculation, which can vary depending on the jurisdictions. For example, respondents in Hong Kong reported that they needed third-party validation before submitting to the Hong Kong Monetary Authority (HKMA) for review.

Nearly half of the banks planning on in-house validation expected to take fewer than three months to complete this phase, while most of those requiring regulatory approval expected to take over three months. Some saw over six months for validation.

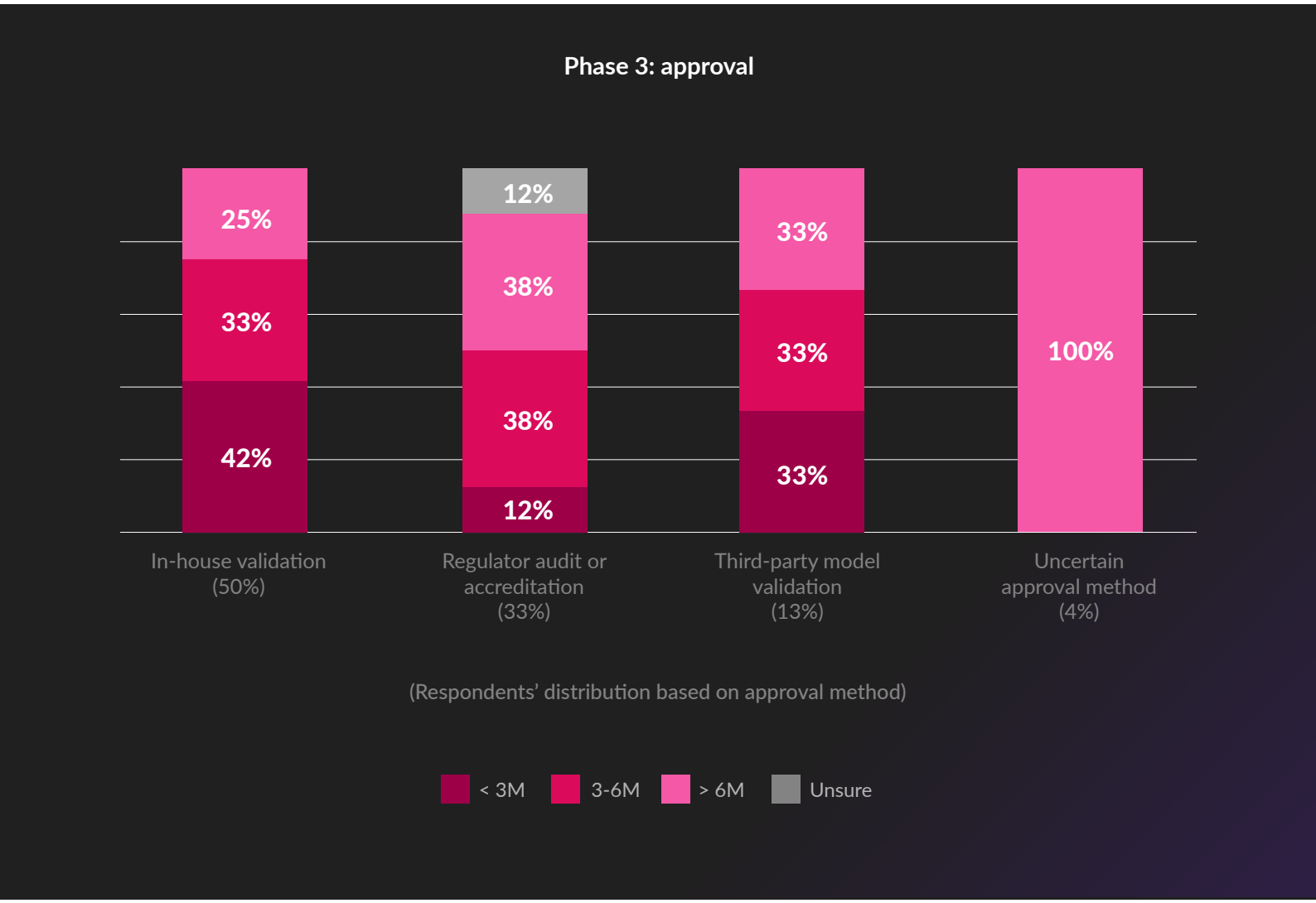


Figure 12: Estimated duration for approval by target validation method for FRTB-SA calculation

We also look at the total project duration from system selection or design to approval.[1]

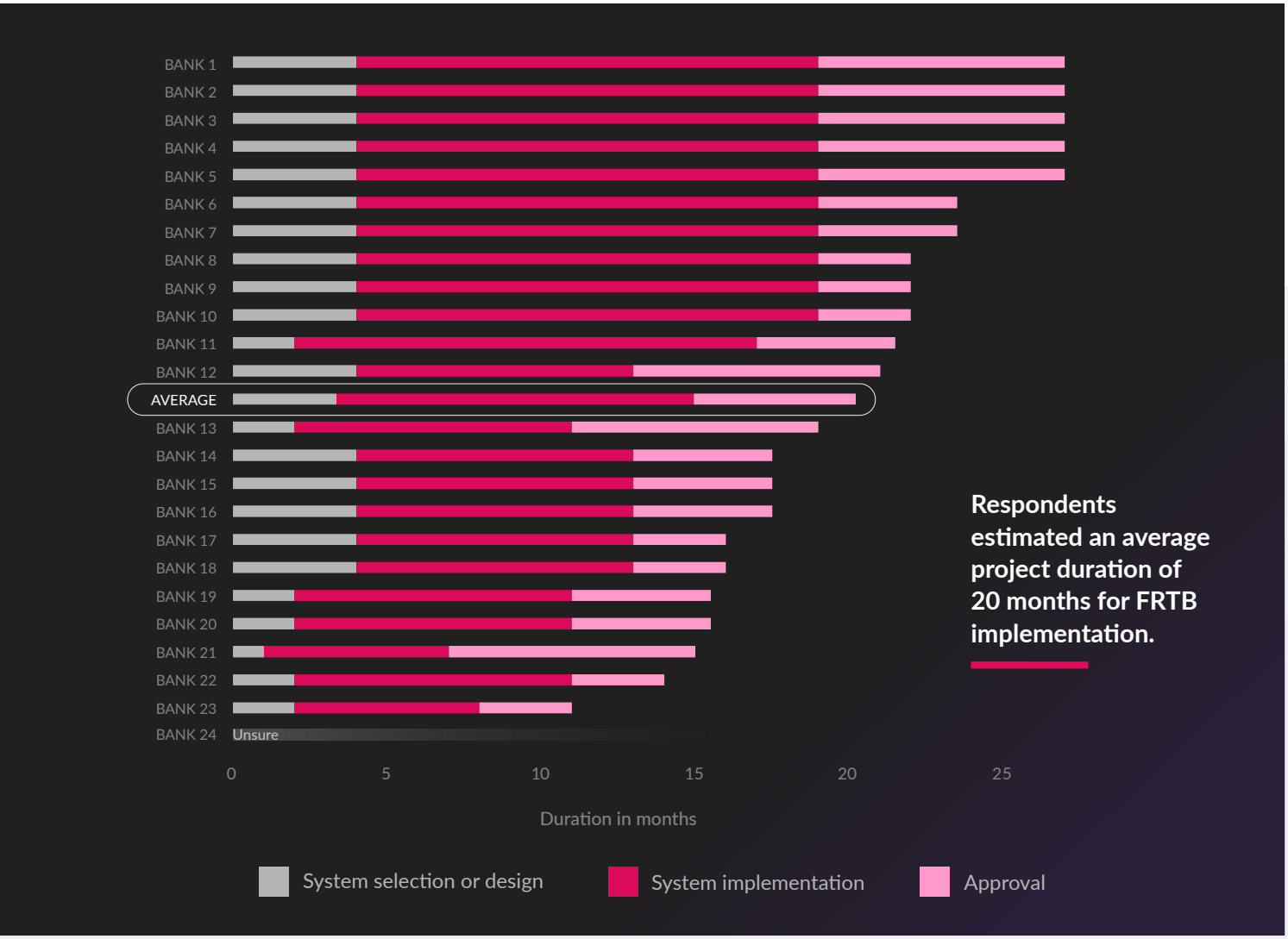


Figure 13: Total estimated duration for FRTB-SA implementation

Larger banks take longer time to implement FRTB-SA.

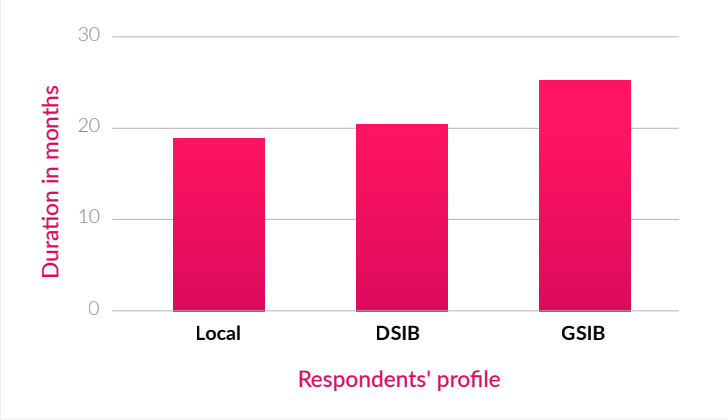


Figure 14: Total estimated duration for FRTB-SA implementation by respondents' profile

[1]Survey participants were asked to choose a duration bracket for each project phase (e.g., 3 to 6 months). In order to present a synthetic summary of the results in this report and its charts, we have applied the following mapping assumptions to present aggregated duration numbers:

Original value	< 1m	1-3m	> 3m	< 6m	6-12m	> 12m	< 3m	3-6m	> 6m
Assumptions	1m	2m	4m	6m	9m	15m	3m	4.5m	8m

Technology and System Design

This section looks at the technology capability and requirements for the upcoming FRTB implementation.

CURRENT SYSTEM CAPABILITIES

Many participating banks have already been through an extensive exercise to evaluate technology requirements and determine whether considerable uplift of their infrastructure is required, including acquiring a new market risk system (MRS).

58% of surveyed banks consider their current MRS ready for FRTB.

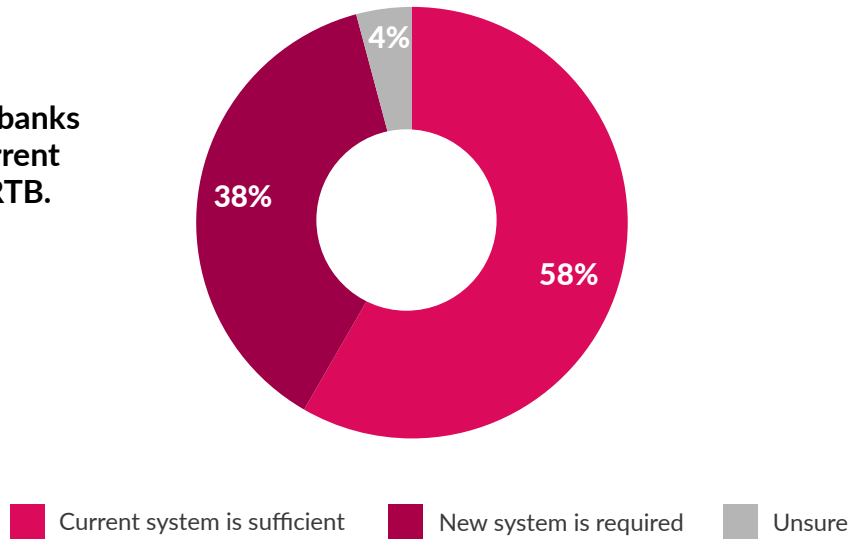
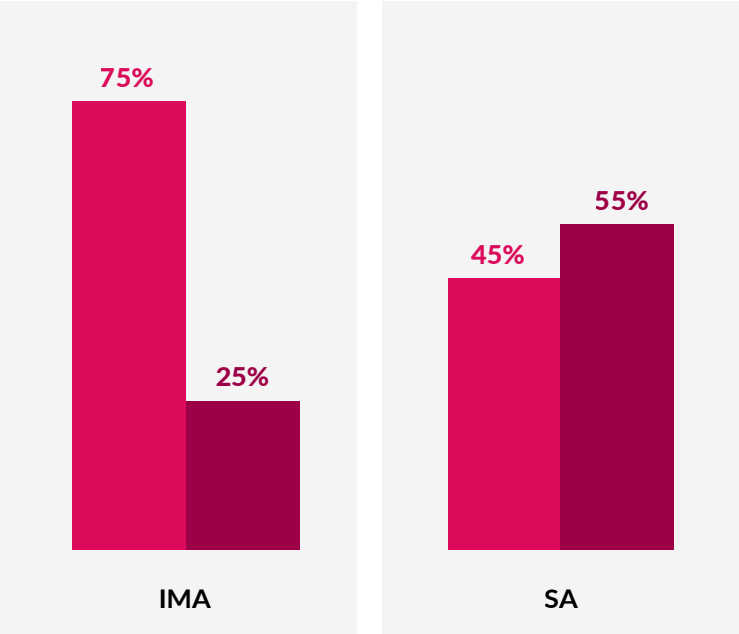


Figure 15: Whether current market risk system is sufficient for FRTB.



75% of surveyed banks targeting FRTB-IMA considered their current MRS ready for FRTB.

The figure is high, but it should be noted that most of the respondents pursuing FRTB-IMA had either already overhauled their market risk system with FRTB in mind or implemented an integrated risk management and trading system.

Current system is sufficient

New system is required

Figure 16: Whether current market risk system is sufficient for FRTB – by target FRTB approach.[2]

[2]Excluding the respondents unsure of target FRTB approach.

Most respondents at D-SIB level stated that their current system could handle FRTB requirements, while most local banks and G-SIB level banks planned to acquire a new system. The latter falls into two main groups: banks targeting FRTB-IMA who are currently running their Basel 2.5 capital charge on a legacy market risk system, and banks targeting FRTB-SA who need to complement current VAR systems with additional tools to fulfill FRTB-SA requirements.

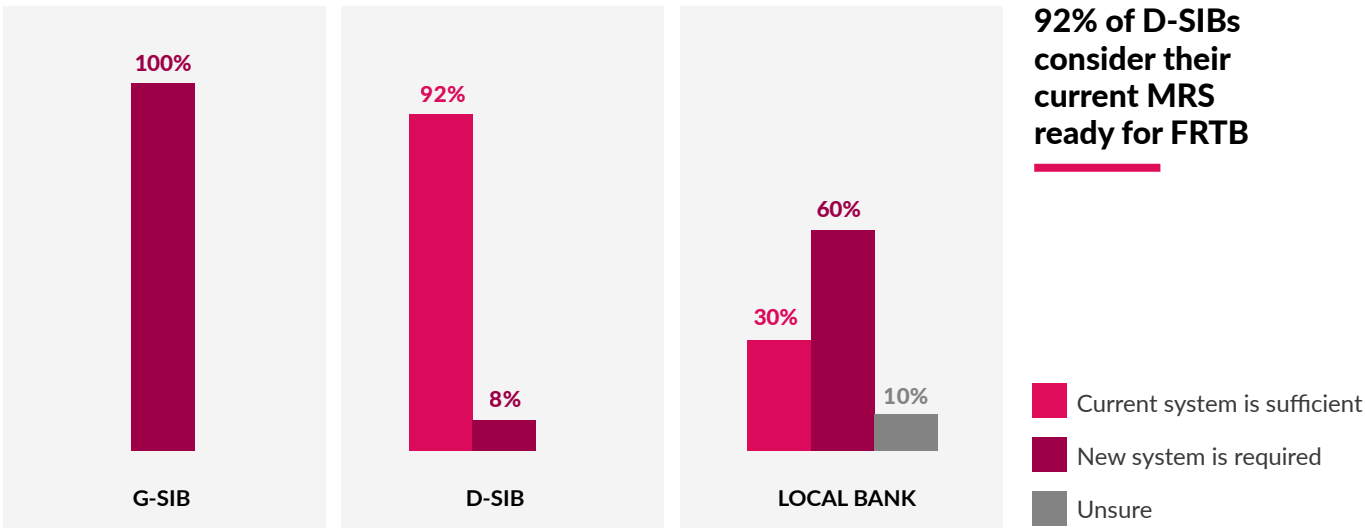


Figure 17: Whether current market risk system is sufficient for FRTB – by profile

RISK INPUTS

Under FRTB-SA, banks are required to source risk inputs (e.g., sensitivities) from the system that they use to manage risk.

Seventy-one percent of the survey participants rely on their front office or trading platform to generate the required risk inputs. It is worth mentioning that the actual proportion can be considered higher, since several of the banks who selected "Risk management system" are actually using an integrated platform covering both trading and risk management. In their case, the sensitivities are already computed by the same risk engine for front office and risk measures.

In our survey sample, it should be noted that a relatively high proportion of our 24 respondents are using integrated trading and risk management platforms. This architecture choice might not be as frequent in other regions, where it can also be common for banks to compute sensitivities in their front office systems and market risk measures like VAR in a separate risk management system or module.

Figure 18: Source of risk inputs

PREFERRED INFRASTRUCTURE MODEL

Several infrastructure models exist in the market. The main ones are:

- **On-premises:** The bank runs the full calculation chain, from trade booking to risk results generation, with hardware and software applications hosted in its own data center.
- **Hybrid or cloud:** The bank still runs the full calculation chain, but the computations are executed partly on-premises and partly on the cloud or fully on the cloud.
- **Software as a Service (SaaS):** The bank does not manage the calculation chain nor host any software or infrastructure required for the calculations. Transaction data is uploaded to an external SaaS-based application that returns the calculated risk figures.

Few banks consider the SaaS model.

Survey participants showing interest in cloud-based services for FRTB-SA are primarily motivated by the expected lower effort to deploy, test and maintain the solution, rather than the potential need for additional computational capacity.

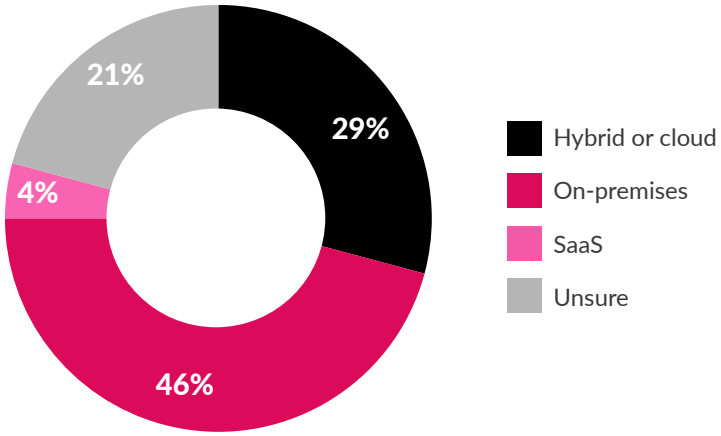


Figure 19: Target infrastructure model

Off-premises services: regulator support matters.

Another important factor for infrastructure model selection is regulator support on the use of off-premises services for sensitive data and computations, particularly in APAC.

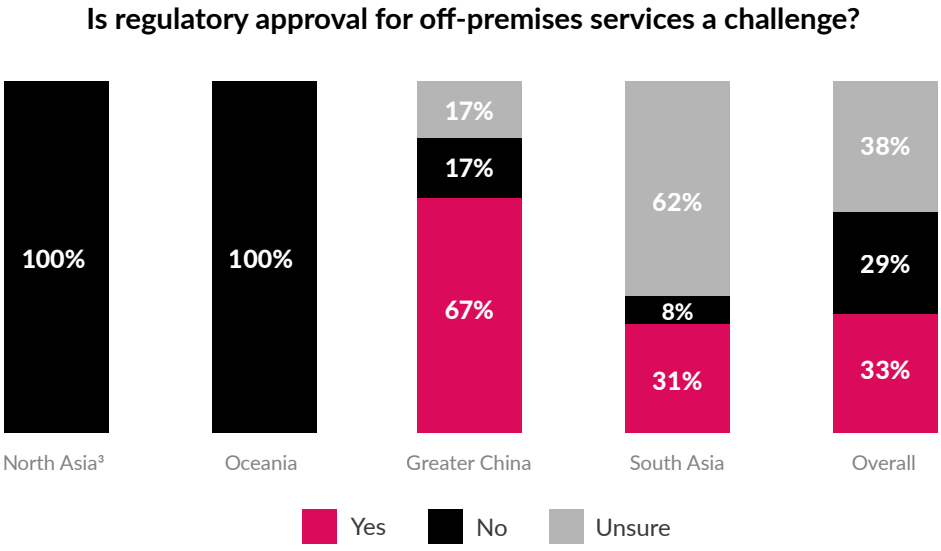


Figure 20: Is regulatory approval for off-premises services a challenge?

Banks anticipating no regulatory challenges on the choice of cloud or SaaS solutions were based in Australia and Japan[3]. Banks that replied "unsure" on this question were also unsure about the target infrastructure model, indicating that these banks have not concretized FRTB implementation plans and therefore have not started analyzing regulatory issues around cloud usage. One clear theme of the approval discussion was the necessity for cloud-based service providers to have a local cloud location to address sensitive data protection concerns.

[3]North Asia here only accounts for Japanese banks, as no South Korean banks answered this question.

Expertise

The implementation of the new market risk standards calls for expertise across a wide range of fields. In this section, respondents highlighted the areas of expertise they valued most and commented on the level and availability of local FRTB expertise and how this impacts preparation efforts.

Most institutions strongly prized expertise in system development and in interpreting regulatory rules. The latter field was particularly important to banks that plan to pursue IMA—presumably because some uncertainty remains at the local level on how rules should be practically applied in specific areas (e.g., RFET and demonstrating the modeling ability of risk factors) and what practices will be deemed acceptable by local regulators.

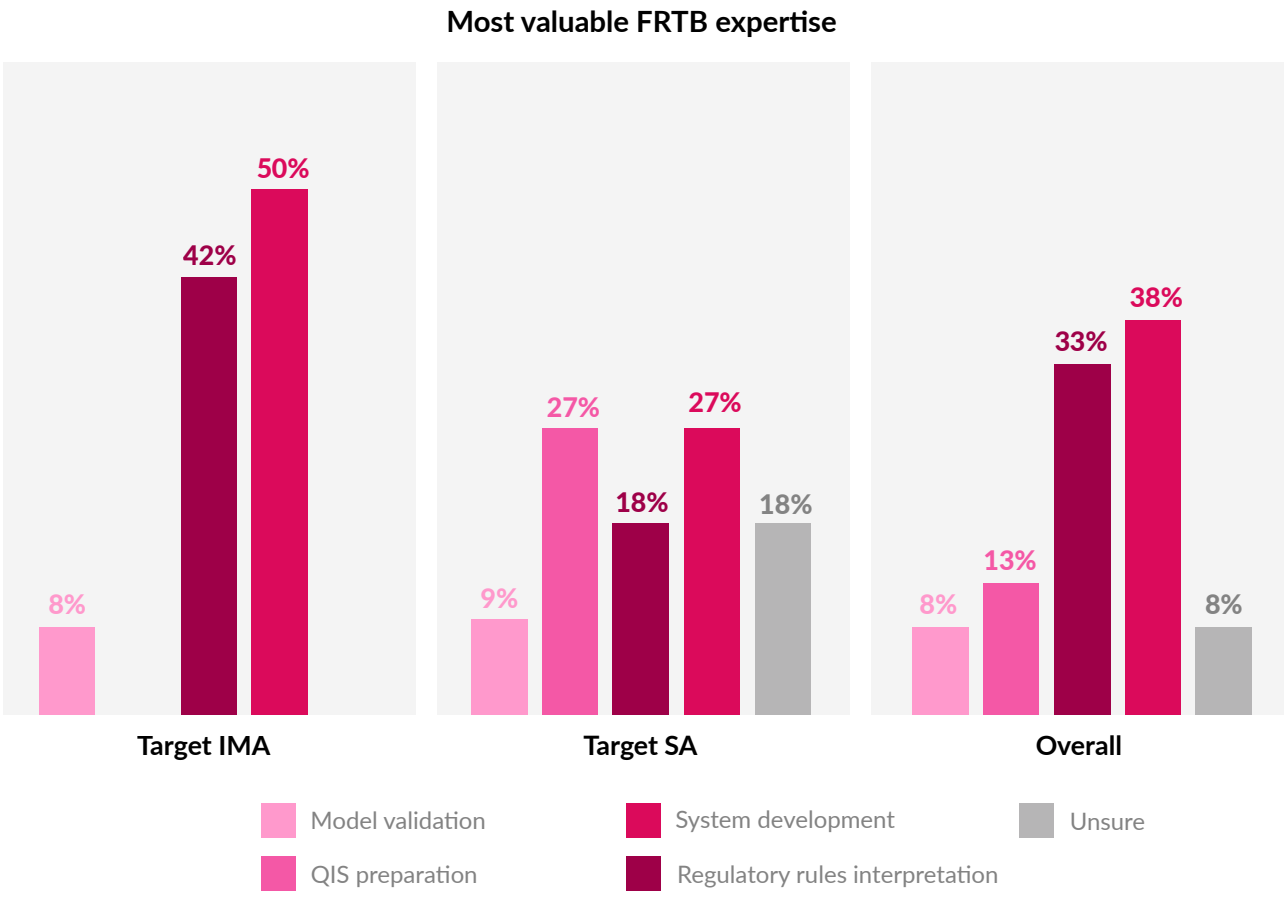


Figure 21: Most valuable FRTB expertise

Bank perception regarding the level and availability of such expertise varies. But the general picture still was one of limited expertise, more on IMA, as mentioned by some respondents in Malaysia and Mainland China. Banks tend to explain expertise scarcity across vendors and consulting firms by pointing out that regulators had yet to issue final rules. Some expressed concerns that even regulator's FRTB expertise was lacking due to focus on other areas, such as credit risk and IRRBB.

Market observers had frequently reported a lack of experience across all stakeholder groups during the initial consultation phases. Since then, bank experts started to exchange with peers at other banks to discuss the interpretation of rules, as well as plans to address issues.

Surveyed banks highly appreciated vendor expertise. They considered the deployment of FRTB as a learning journey with their vendor partners.

Synergies

FRTB AND CREDIT VALUE ADJUSTMENT (CVA)

FRTB is not the only one regulatory initiative impacting financial institutions. Several others have technical and computational overlaps with FRTB.

The next and most important upcoming change is likely to be the credit value adjustment (CVA) capital charge. The Basel III standards include an updated methodology for the computation of the CVA capital charge as part of the broad market risk capital framework. The more advanced of the two methods—basic or standardized—requires advanced modelling and computation capabilities to generate the CVA sensitivities inputs, which are then classified and aggregated in a process that very closely mirrors the sensitivity-based method (SBM) under FRTB-SA. The new framework also enables banks to exclude CVA hedging trades from the trading book market risk capital charge (FRTB) and process them together with their CVA exposures in the new standardized approach CVA (SA-CVA). This addresses a well-publicized criticism of the Basel II framework, where CVA hedges were unfairly attracting high market risk capital charges because they were viewed as naked positions.

For banks considering the SA-CVA method, the technical and computational similarities with FRTB-SA and its operating requirements (e.g., identification and mapping of CVA credit and market hedges) are a driver to analyze synergies around systems and data management processes.

Will CVA capital charge and FRTB come into force together?

Nearly half of the survey respondents think that this revised CVA capital charge will come into force separately and after FRTB.

Those that think it will come at the same time as FRTB are in South Asia, Singapore, India and Thailand.

For more details on the FRTB and CVA timelines for key financial jurisdictions, refer to Appendix B.

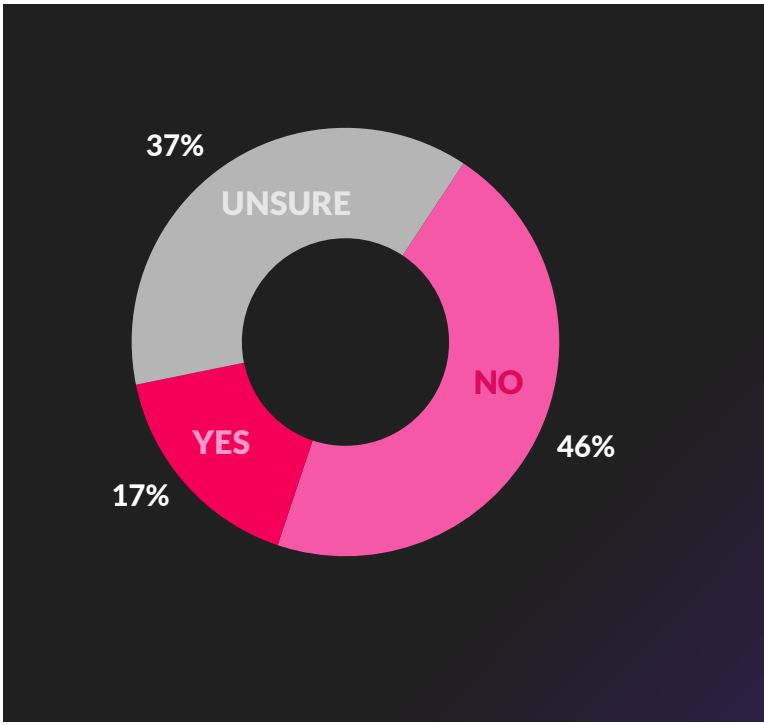


Figure 22: Will CVA capital charge and FRTB come into force together?

FRTB AND OTHER BUSINESS LINES

Additionally, a motivation behind FRTB rules is to bring risk capital calculations into closer alignment with business lines and other regulatory capital calculations. Banks were surveyed on the importance of aligning valuations performed in FRTB with other aspects of their activities, such as risk, finance and Standard Initial Margin Model (SIMM), as well as the importance of data management, system and processes across risk and regulatory computations.

Half of the respondents consider it critical to align the inputs and valuations between FRTB and front office risk, between FRTB and finance and across regulatory computations.

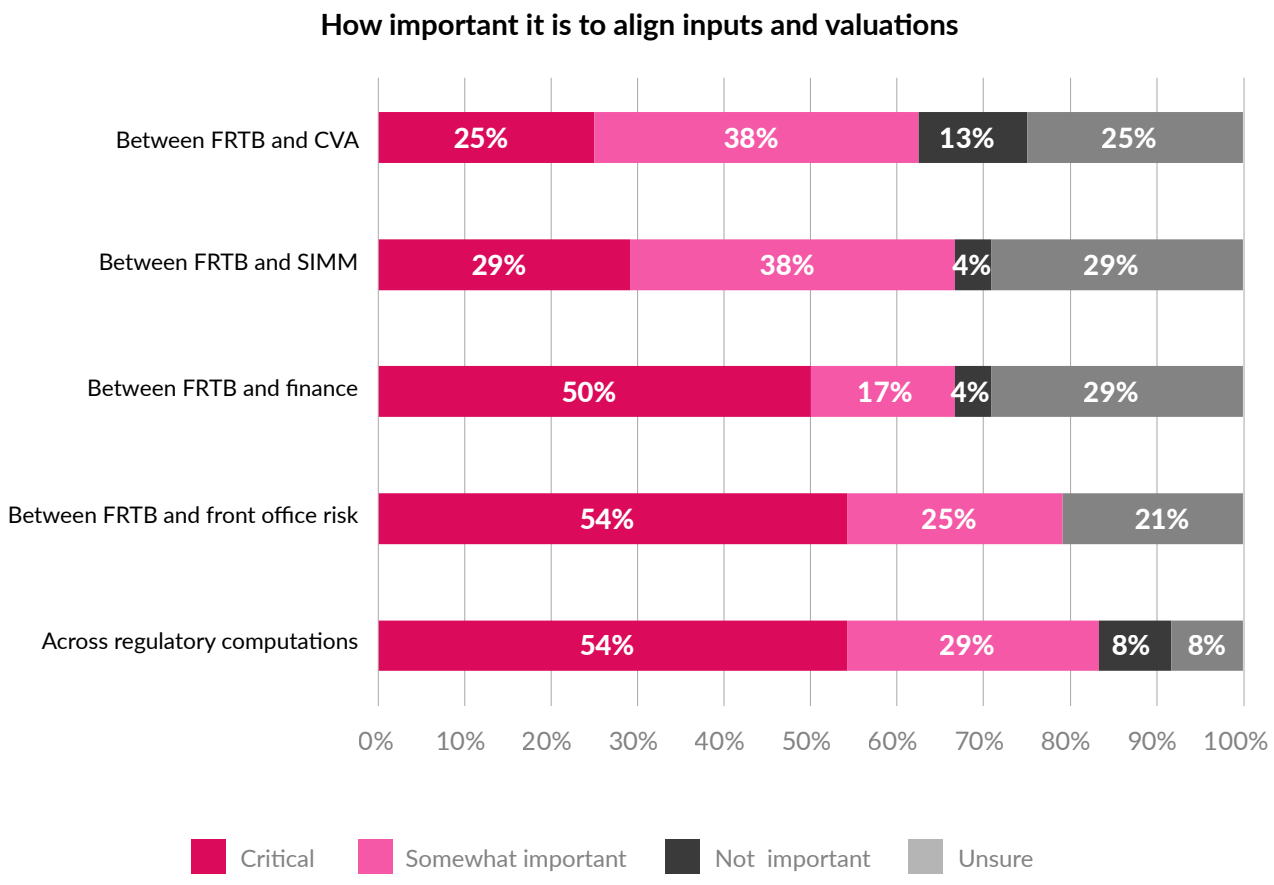


Figure 23: Importance of the alignment of inputs and valuations among business lines and across regulatory computations

KEY TAKEAWAYS

Murex surveyed 24 financial institutions from 11 Asia Pacific jurisdictions to produce this report. The findings indicate that significant uncertainty around actual FRTB implementation timelines remains. Delays in multiple jurisdictions are possible. Nevertheless, good regulatory engagement progress has been achieved in recent years. Most institutions now have a clear picture of next steps and future implementation challenges.

Across the region, most respondents broadly fall into two contrasting groups:

- The first group are banks that are already well advanced on their FRTB journey, despite some uncertainty on timelines at the time of polling. These are primarily G-SIBs or D-SIBs from Australia, mainland China, Japan and Singapore. Most of these financial institutions plan to apply for FRTB-IMA and have already initiated significant investment in market risk systems to support the new framework.

- A second group of banks, mainly in India, Indonesia, Malaysia and Thailand, are typically at the very early stages of their FRTB implementation journey. Most of these banks plan to remain on the standardized approach only. They expect to report capital under the new rules significantly later or are still facing timeframes or rules definition uncertainty. They are also raising concerns about the availability of relevant expertise in their markets.

However, some trends transcend this classification. Half of the respondents were considering adopting internal model approach under FRTB, even though the vast majority currently use standardized approach. Most banks also expected to see a significant increase in market risk capital requirements of a factor of 1.5 to 3, be it under SA or IMA.

Concerning the timeline on the FRTB conformity, on average, banks indicate readiness within 20 months. A great number of them highlighted data management as the most difficult, time-consuming and costly aspect of FRTB implementation projects. These banks underscore the significant additional data mapping framework required for the FRTB-SA bucketing.

Around half of the banks surveyed were confident in their current system's capacity to meet the FRTB requirements. However, it is worth mentioning that most of the respondents pursuing FRTB-IMA had either already overhauled their market risk system or implemented an integrated risk management and risk system.

FRTB expertise is much sought after, notably the one on regulatory rules interpretation and system developments. Together with vendor partners, banks are developing necessary competences to ensure a successful FRTB implementation.

Lastly, FRTB rules urged banks to analyze synergies across various business lines and regulatory capital calculations. Half of the respondents underline the importance of inputs and valuations alignment between FRTB and front office risk, FRTB and finance, and across regulatory computations.

LOOKING FORWARD

This survey indicates that APAC banks might now have reached a tipping point where the majority have clear and detailed execution plans or have projects for FRTB compliance already in progress.

However, challenges around FRTB implementation are shared industry wise.

To address data management issues as well as the complexity of new calculations and trade data consolidation required by FRTB, banks are clearly investing in systems. A significant number plan to integrate trading and risk management processes onto a common platform to produce accurate and consistent risk figures. Some banks are also looking to cloud infrastructure to improve productivity on deployment, test and maintenance.

One thing for sure, to secure and accelerate FRTB adoption, banks are working hand in hand with peer professionals, regulators and technology partners.

APPENDIX A - GLOSSARY

Curvature risk: the additional potential loss beyond delta risk due to a change in a risk factor for financial instruments with optionality. In the standardized approach in the market risk framework, it is based on two stress scenarios involving an upward shock and a downward shock to each regulatory risk factor.

Default risk charge (DRC): a risk charge intended to capture the Jump-to-Default (JTD) risk of an instrument i.e., the loss that would be suffered by the holder if the issuer of the bond or equity were to default.

Delta risk: the linear estimate of the change in value of a financial instrument due to a movement in the value of a risk factor. The risk factor could be the price of an equity or commodity, or a change in an interest rate, credit spread or FX rate.

Expected shortfall (ES): a measure of the average of all potential losses exceeding the VAR at a given confidence level.

Hypothetical P&L (HPL): the daily P&L produced by revaluing the positions held at the end of the previous day using the market data at the end of the current day. Commissions, fees, intraday trading and new/modified deals, valuation adjustments for which separate regulatory capital approaches have been otherwise specified as part of the rules and valuation adjustments which are deducted from Common Equity Tier 1 (CET1) are excluded from the HPL. Valuation adjustments updated daily should usually be included in the HPL. Time effects should be treated in a consistent manner in the HPL and risk-theoretical P&L.

Incremental risk charge (IRC): a one-year VAR measure based on credit risk elements of market risk, at a 99.9% confidence level.

Modellable risk factor: risk factors that are deemed modellable, based on the number of representative real prices and additional qualitative principles related to the data used for the calibration of the ES model. Risk factors that do not meet the requirements for the risk factor eligibility test are deemed as non-modellable risk factors (NMRF).

P&L attribution test (PLA test): a text to compare daily risk-theoretical P&L (RTPL) with the daily hypothetical P&L (HPL) for each trading desk. It intends to: (i) measure the materiality of simplifications in a banks' internal models used for determining market risk capital requirements driven by missing risk factors and differences in the way positions are valued compared with their front office systems; and (ii) prevent banks from using their internal models for the purposes of capital requirements when such simplifications are considered material. The PLA test must be performed on a standalone basis for each trading desk in scope for use of the IMA.

Real prices: a term used for assessing whether risk factors pass the RFET. A price will be considered real if it is (i) a price from an actual transaction conducted by the bank, (ii) a price from an actual transaction between other arm's length parties (e.g., at an exchange), or 12 Minimum capital requirements for market risk (iii) a price taken from a firm quote (i.e., a price at which the bank could transact with an arm's length party).

Residual risk add-on (RRAO): the simple sum of gross notional amounts of the instruments bearing residual risks, multiplied by a risk weight.

Risk-weighted assets (RWA): a bank's assets or off-balance-sheet exposures, weighted according to risk, that are used to determine the minimum amount of regulatory capital that must be held by the bank.

Risk factor eligibility test (RFET): assessment on whether a risk factor is modellable. It requires identification of a sufficient number of real prices that are representative of the risk factor.

Risk theoretical P&L (RTPL): the daily desk-level P&L that is predicted by the valuation engines in the trading desk risk management model using all risk factors used in the trading desk risk management model (i.e., including the non-modellable risk factors).

Sensitivities-based method (SBM): the method to calculate market risk capital requirement under Basel III standardized approach. The sensitivities of financial instruments to a prescribed list of risk factors are used to calculate the delta, vega and curvature risk capital requirements. These sensitivities are risk-weighted and then aggregated, first within risk buckets (risk factors with common characteristics) and then across buckets within the same risk class.

Stressed expected shortfall (SES): ES under stressed market conditions.

Stressed value at risk (sVAR): value at risk (VAR) under stressed market conditions.

Value at risk (VAR): a statistical measure of the riskiness of financial entities or portfolios of assets. It estimates how much a set of investments might lose with a given probability, in a set period.

Vega risk: the potential loss resulting from the change in value of a derivative due to a change in the implied volatility of its underlying.

APPENDIX B - BASEL III FRTB AND CVA TIMELINES

We listed below the implementation timelines for FRTB and CVA under Basel III framework that we gathered via various sources, as of March 2023.

Jurisdiction	FRTB[4]	CVA
EU	Implementation of FRTB and CVA risk under the CRR III proposal by 1st January 2025[5]	
UK	Implementation of Basel III regulatory framework by 1st January 2025[6]	
Switzerland	Implementation of Basel III regulatory framework by 1st July 2024[7]	
US	Implementation of Basel III regulatory framework by 1st January 2025 (expected) [8]	
Canada	Implementation of the revised CVA risk and the market risk chapters of the CAR by Q1-2024[9]	
Australia	Implementation of FRTB and CVA risk by 1st January 2025[6]	
Indonesia	Implementation of Basel III regulatory framework by 1st January 2024[10]	
Hong Kong	Implementation of Basel III regulatory framework by 1st January 2024[11]	
Japan	Implementation of Basel III regulatory framework by March 2023 for all internationally active banks, as well as non-internationally active banks that use IMA, and by March 2024 for non-internationally active banks that use SA[12]	
Singapore	Implementation of Basel III regulatory framework between 1st January 2024 and 1st January 2025 ***(final timeline to be published by 1st July 2023[13])***	
China	Implementation by 1st January 2024[14]	Unclear
India	Implementation of simplified standardized approach by 1st April 2024[15]	Unclear
Malaysia	Unclear	Unclear
South Korea	Implementation by 1st January 2023	Unclear
Taiwan	Implementation by 1st January 2025[16]	Unclear

[4]Source: https://www.bis.org/bcbs/implementation/rcap_reports.htm, as of Sep 2022

[5]Source: https://www.isda.org/a/IeygE/Updated-OTC-Derivatives-Compliance-Calendar-2023-2-1.pdf

[6]Source: https://www.bankofengland.co.uk/prudential-regulation/publication/2022/november/implementation-of-the-basel-3-1-standards

[7]Source: https://www.finma.ch/en/news/2022/07/20220704-mm-anhoerung-basel/

[8]Source: https://www.risk.net/regulation/7955037/fed-official-confirms-us-targeting-2025-for-basel-iii-adoption?check_logged_in=1

[9]Source: https://www.osfi-bsif.gc.ca/Eng/fi-if/rg-ro/gdn-ort/gl-ld/Pages/basel23_let.aspx

[10]Source: https://www.ojk.go.id/iru/policy/detailpolicy/9754/press-release-ojk-supported-to-broaden-the-role-of-the-financial-services-sector-throughout-2022-and-will-strengthen-resilience-and-integrity-in-2023

[11]Source: https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2022/20221125e2.pdf

[12]Source: https://www.fsa.go.jp/en/newsletter/weekly2021/459.html

[13]Source: https://www.mas.gov.sg/-/media/mas-media-library/regulation/circulars/ppd/2022-12-19-reporting-schedules-for-submission-via-mas-dcg-and-implementation-timeline_01.pdf

[14]Source: http://www.cbirc.gov.cn/cn/view/pages/ItemDetail.html?docId=1096436&itemId=915

[15]Source: https://www.rbi.org.in/Scripts/bs_viewcontent.aspx?Id=4238

[16]Source: https://www.fsc.gov.tw/en/home.jsp?id=54&parentpath=0,2&mcustomize=multimessage_view.jsp&dataser-no=202107260001&dtable=News

MUREX AND FRTB

In 2015, Murex released MX.3 for FRTB, an innovative enterprise-wide software solution that aligns risk and trading analytics to meet the demands of the new market risk capital framework. Across all asset classes, the Murex solution provides highly accurate risk calculations and optimal performance through advanced computing techniques. With its comprehensive integration framework for importing positions, sensitivities or P&L vectors, it adapts flexibly to an institution's existing infrastructure, allowing the client to meet compliance deadlines and efficiently anticipate and manage capital impacts.

One year later, Murex and InteDelta jointly published a first FRTB market survey that focused on the business implications of the regulation and the state of banks' preparation.

Since then, the FRTB rules have undergone several changes. Murex has continued to work closely with banks and other market participants. Murex has continuously invested in its solution and deployment methodology to deliver required changes at scale with predictability, flexibility, and cost control.

The FRTB survey on APAC banks, released in 2023, is the subject of this report. The survey aims to help financial institutions position themselves among their peers and identify best practices.

Murex has developed rich implementation experience developed over 40 FRTB projects. Our team is proud to be a trusted advisor and to help clients reach FRTB compliance and achieve strategic readiness for future regulatory, business and technology challenges.

For more information on Murex solution for FRTB, past surveys and customers case studies, visit www.murex.com/en/frtbsolution and contact Murex directly at info@murex.com.

About Murex

For more than 30 years, Murex has provided enterprise-wide, cross-asset financial technology solutions to capital markets players. Its cross-function platform, MX.3, supports trading, treasury, risk and post-trade operations, enabling clients to better meet regulatory requirements, manage enterprise-wide risk, and control IT costs. With more than 57,000 daily users in more than 60 countries, Murex has clients across the financial services industry, from banking and asset management to energy and commodities. Murex is an independent company with over 2,700 employees across 19 locations. Murex is committed to providing cutting-edge technology, superior customer service and unique product innovation. MX.3 is specifically designed and engineered to meet the multifaceted challenges of a transforming financial industry. To find out more, visit www.murex.com.

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