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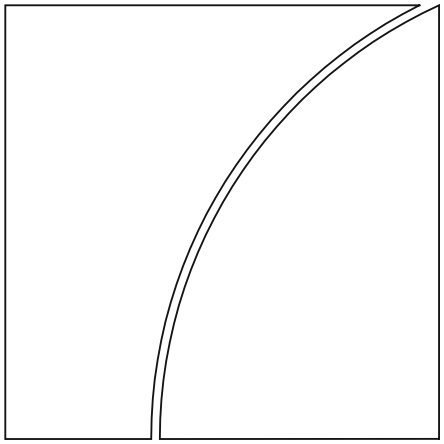

Review of the implementation of margin requirements for non-centrally cleared derivatives

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Executive summary

In September 2013, the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO) published *Margin requirements for non-centrally cleared derivatives* ("Working Group on Margining Requirements (WGMR) framework" or "framework"). The framework establishes minimum standards for margin requirements for non-centrally cleared derivatives (NCCDs). It was developed in response to the G20 call on the BCBS and IOSCO to develop standards for the margining of NCCDs.

Element eight of the WGMR framework calls for regulators to review the state of implementation, readiness, efficacy and appropriateness of the framework once the requirements are in place and operative. The final implementation phase began in September 2022, and implementation is now generally in a steady state. Therefore, the WGMR has assessed implementation of the framework.

To assess the implementation of the framework, the WGMR relied primarily on three sources of information: (i) an updated quantitative impact study (QIS), conducted in 2024, which can be compared with the initial 2012 QIS data to provide insights on the framework's characteristics and benchmark its impact on coverage; (ii) a survey of WGMR members to provide the perspective of authorities on the effectiveness of the WGMR framework; and (iii) information gathered as a result of recent margin work conducted by various international committees.

The WGMR's analysis did not find any evidence of material issues with the implementation of the framework. While jurisdictions may continue making adjustments, the overall implementation of the framework has generally reached a steady state. The amount of margin exchanged for NCCDs has increased significantly since 2012 in absolute and relative value when compared with notional value, making the financial system more resilient. Findings in the 2024 QIS data collection also support the decision to add a sixth phase of implementation and the recommendations of a 2025 WGMR report regarding initial margin and variation margin. Finally, a study of the network of counterparties was completed, where results generally align with the "hub-and-spoke" model of NCCD market structure.

The analysis also finds the WGMR framework's impact has been consistent with the intended functioning of the capital and centrally cleared margin frameworks. No substantial issues related to the interaction with centrally cleared markets were identified in recent episodes of market stress. The organic emergence of a thriving services sector and industry committees to support the non-centrally cleared regulatory margin ecosystem can be seen as a sign that the WGMR framework is accepted by national jurisdictions and market participants.

The WGMR does not propose any changes to the WGMR framework. In light of the continued evolution of margining practices (eg changes to the International Swaps and Derivatives Association processes), certain limitations in available data and authorities' continued evaluation of margin frameworks, the WGMR recommends continued monitoring in the form of supervisory information exchange and the sharing of experiences among its members.

1. Introduction

Reforms to over-the-counter (OTC) derivatives markets were a key element of the G20 response to the 2008 Great Financial Crisis. The programme of reforms included several policies to encourage central clearing of derivatives and a call for the development of consistent global standards for initial margin (IM) and variation margin (VM) requirements on non-centrally cleared derivatives (NCCDs). In response, the Basel Committee for Banking Supervision (BCBS) and International Organization of Securities Commissions (IOSCO) established the Working Group on Margining Requirements (WGMR), in consultation with the BIS Committee on Payments and Market Infrastructures (CPMI). The WGMR's work resulted in the publication of *Margin requirements for non-centrally cleared derivatives* ("WGMR framework" or "framework") in September 2013. A fuller discussion of the G20's response and the need for margin requirements on NCCDs is included as an appendix.

The WGMR was tasked with monitoring the implementation and effectiveness of the WGMR framework, including by assessing its costs and benefits and its interactions with other regulatory initiatives. The final implementation phase began in 2022. This report assesses the implementation of the framework now that it has generally reached a steady state.

The report is divided into five sections: section 2 discusses the implementation of the WGMR framework across jurisdictions; section 3 assesses the adequacy of the framework, adding analysis of an ad hoc data collection to the conclusions of previous reports; section 4 highlights remaining challenges; and section 5 concludes.

2. Implementation and related regulatory initiatives across jurisdictions

2.1 Implementation progress across jurisdictions

Recognising that the imposition of margin requirements on NCCDs represented a significant policy change for most market participants, the WGMR framework was designed to balance reductions in systemic risk against liquidity, operational and transition costs associated with its implementation. To that end, implementation was initially staggered into five phases, with a different set of entities coming into scope in each phase. To accommodate the large number of participants coming into scope in Phase 5, a sixth phase was added in 2019 (see Table 1 for more information on the implementation phases).[1]

[1] BCBS and IOSCO, *Margin requirements for non-centrally cleared derivatives*, requirement 8, April 2020.

Scheduled phased-in approach for two-way initial margin requirements

Table 1

	Start date	Minimum notional amount of non-centrally cleared derivatives
Phase 1	September 2016	€3.0 trillion
Phase 2	September 2017	€2.25 trillion
Phase 3	September 2018	€1.5 trillion
Phase 4	September 2019	€0.75 trillion
Phase 5	September 2021	€50 billion
Phase 6	September 2022	€8 billion

Source: BCBS and IOSCO, *Margin requirements for non-centrally cleared derivatives*, requirement 8, April 2020.

In practice, the implementation schedules varied across jurisdictions, though most have implemented the framework as of this assessment. Importantly, the number of jurisdictions implementing the WGMR framework has expanded recently and could continue to expand. Implementation status and timelines for WGMR members are detailed in Table 2 below.

Implementation status for WGMR members

Table 2

Jurisdiction/agency	Date of issuance of rulemaking	Date of implementation
Argentina	Not implemented	N/A
Australia	December 2016	March 2017
Brazil	May 2018	September 2019
Canada	February 2016	September 2016
European Union	December 2016	January 2017
Hong Kong SAR (HKMA)	January 2017	March 2017
Hong Kong SAR (SFC)	June 2020	Variation margin: September 2020; Initial margin: September 2021
India	Variation margin: June 2022; Initial margin: May 2024	Variation margin: May 2023; Initial margin: April 2025
Japan	March 2016	September 2016
Mexico	March 2023	January 2025
Saudi Arabia	June 2016	September 2022
South Africa	June 2020	August 2021
South Korea	February 2017	September 2017
Singapore	December 2016	March 2017
Switzerland	July 2017	August 2017
United Kingdom	December 2016	January 2017
United States (CFTC)	December 2015	September 2016
United States(prudential regulators)	October 2015	September 2016
United States (SEC)	June 2019	October 2021

HKMA = Hong Kong Monetary Authority; SFC = Securities and Futures Commission; CFTC = Commodity Futures Trading Commission; SEC = U.S. Securities and Exchange Commission.

Source: WGMR member-provided information. WGMR members that have not provided information do not appear in the table.

2.2 Implementation approaches

A key principle of the WGMR framework is that interactions between regulatory regimes should result in a sufficiently consistent and non-duplicative set of margin requirements across jurisdictions.[2] To understand each jurisdiction's implementation of the framework, WGMR members completed a survey on their framework implementation and any challenges they faced. Overall, respondents generally found the framework compatible with other regulatory initiatives.

The framework includes eight elements designed to reduce the risk associated with NCCDs. This section discusses jurisdictions' approaches to implementing each of these elements.

Element 1. *Appropriate margining practices should be in place with respect to all derivatives transactions that are not cleared by central counterparties (CCPs).*

This element states that all derivatives from which systemic risk could build should be collateralised.[3] In practice, jurisdictions have converged on products scoped in, with very few exceptions.

All respondents to the survey indicated their implementation of the framework covers more than 90% of the transactions in the scope of the standard. There are some differences in the scope of products covered by jurisdictions' implementation of the WGMR framework. Some jurisdictions highlighted that they have currently exempted non-centrally cleared single-stock equity options and index options from the framework to avoid regulatory fragmentation. In some cases, these products are subject to margin requirements under other rules (eg the margin requirements for securities customers of broker-dealers in the United States).[4]

Element 2. *All financial firms and systemically important non-financial entities ("covered entities") that engage in non-centrally cleared derivatives must exchange initial and variation margin as appropriate to the counterparty risks posed by such transactions.*

The framework generally applies to financial firms and systemically important non-financial firms. It includes a series of exemptions to the scope of covered entities, since imposing margin requirements in certain cases would not have been proportionate to the risks OTC derivatives exposures pose for financial stability. The framework includes exemptions for central banks, the Bank for International Settlements, multilateral development banks, sovereigns and non-systemic non-financial entities. Some exemptions are categorical (eg sovereigns) while others are implemented via activity and exposure thresholds. The precise definitions of financial firms, non-financial firms and systemically important non-financial firms are determined by national regulation but have generally converged across jurisdictions. This is also true with regard to scoping in activity and exposure thresholds. This element also calls for frequent exchange of collateral; jurisdictions have converged on the daily exchange of margin, with some accommodations for relationships that cross time zones.

Element 3. *The methodologies for calculating initial and variation margin that serve as the baseline for margin collected from a counterparty should: (i) be consistent across entities covered by the requirements and reflect the potential future exposure (initial margin) and current exposure (variation margin) associated with the portfolio of non-centrally cleared derivatives in question; and (ii) ensure that all counterparty risk exposures are fully covered with a high degree of confidence.*

The WGMR framework established standards for calculating baseline VM and IM with the intention of offsetting losses caused by counterparty defaults with a high degree of confidence and

[2] WGMR framework, key principle 7.

[3] The framework includes an exception for physically settled foreign exchange (FX) forwards and swaps.

[4] See, eg FINRA Rule 4210(f)(2), at www.finra.org/rules-guidance/rulebooks/finra-rules/4210.

providing incentives to clear where the same or similar transactions are available to clear. The standard is also meant to produce consistent margin amounts across covered entities.

The framework requires firms that wish to use models for IM calculation to obtain supervisory pre-approval.[5] In some jurisdictions, authorities specify the supervisory procedures for ensuring the initial and ongoing validation of the relevant risk-management procedures, including supervisory pre-approval processes for using models. These stringent model requirements, together with the operational needs of meeting tight timelines and minimising disputes, encouraged the development of a standard industry margin model, the International Swaps and Derivatives Association (ISDA) Standard Initial Margin Model (SIMM), as an alternative to relying on firm-specific models. For simpler or smaller portfolios or as a backup for assets that cannot be modelled, the framework includes a table of standardised IM rates.

VM is calculated and exchanged daily as the full mark-to-market exposure. The framework sets standards for a rigorous and robust dispute resolution procedure in case a valuation dispute arises; this is particularly important for less liquid instruments. Industry participants have developed third-party services and harmonised procedures to facilitate the detection and resolution of disagreements (see section 2.3).

Element 4. *To ensure that assets collected as collateral for initial and variation margin purposes can be liquidated in a reasonable amount of time to generate proceeds that could sufficiently protect collecting entities covered by the requirements from losses on non-centrally cleared derivatives in the event of a counterparty default, these assets should be highly liquid and should, after accounting for an appropriate haircut, be able to hold their value in times of financial market stress.*

The WGMR framework leaves the choice of appropriate collateral to each jurisdiction to balance the quality and availability of eligible assets and sets standards for appropriate haircuts to be applied to compensate for the potential volatility of each asset. While the framework permits the use of models to calculate haircuts, this option has been adopted only by a few jurisdictions. There has been convergence in the sets of allowable assets, with industry mostly using government bonds and cash (this was also a core element of a report produced by the WGMR in early 2025; see section 3.1).

Element 5. *Initial margin should be exchanged by both parties, without netting of amounts collected by each party (ie on a gross basis) and held in such a way as to ensure that: (i) the margin collected is immediately available to the collecting party in the event of the counterparty's default; and (ii) the collected margin must be subject to arrangements that fully protect the posting party to the extent possible under applicable law in the event that the collecting party enters bankruptcy.*

A key element of the WGMR framework is the bilateral exchange of gross IM. This has been transposed into national rules in various ways, but with consistent outcomes. The legal capacity in which IM collateral is held or exchanged can have a significant influence on the effectiveness of the intended protections. Except in very limited circumstances, the framework requires segregation and limits rehypothecation, repledging and reuse of IM collateral. Industry participants have developed various alternative segregation arrangements (eg tri-party and third-party) as well as operational standards for the access to collateral (see section 2.3).

To limit the liquidity impact of collateralisation, VM can be exchanged on a net basis and the collected collateral can be rehypothecated, repledged and reused.

Element 6. *Transactions between a firm and its affiliates should be subject to appropriate regulation in a manner consistent with each jurisdiction's legal and regulatory framework.*

[5] IM models should meet conditions regarding the use of historical data, including periods of stress and the level of confidence in their sufficiency. The WGMR framework noted that the offsets recognised within the model must be supported in the netting provisions under the contract documentation. Diversification benefits are recognised within well-defined asset classes but not across them.

This element recognises that inter-affiliate transactions are used for different purposes within organisations and that imposing regulation as if they were unaffiliated could interfere with other supervisory objectives. The framework therefore allows national regulators to establish appropriate regulation. In practice, there has been extensive convergence, with jurisdictions often exempting inter-affiliate transactions from IM requirements and limiting the application of VM requirements depending on the sophistication of a group's centralised risk management and the absence of legal or operational obstacles to the transfer of VM.

Element 7. *Regulatory regimes should interact so as to result in sufficiently consistent and non-duplicative regulatory margin requirements for non-centrally cleared derivatives across jurisdictions.*

The WGMR framework encourages cooperation, harmonisation, mutual recognition and deference to minimise complexity and avoid creating obstacles to cross-jurisdiction derivatives trading. To that end, various jurisdictions permit a covered entity to comply with the margin requirements of a host-country with respect to its derivatives activities in that country. This is sometimes referred to as substituted compliance or equivalence and is either embedded in the rule design or granted by application.

Element 8. *Margin requirements should be phased in over an appropriate period of time to ensure that the transition costs associated with the new framework can be appropriately managed.*

As discussed above, most jurisdictions implemented the framework in a timely manner, and most parties, transactions and exposures were brought into scope per the revised implementation schedule.

2.3 Industry and market developments

Several types of third-party services have developed through industry efforts to help firms comply with the implementation of the WGMR framework. ISDA continues to update and validate SIMM, and industry-led efforts have resulted in some enhancements to improve the functioning of the WGMR framework. These services include segregated custody of collateral, reconciliation, margin optimisation through post-trade risk reduction services and automation and standardisation of documentation.

Since the adoption of the WGMR framework, ISDA has published a series of standardised bilateral documents that enable counterparties to enter into agreements to exchange VM and IM. These documents are part of a larger set of derivatives relationship documents that may be applicable to transactions in NCCDs. For example, the ISDA Regulatory Margin Self-Disclosure Letter assists market participants in determining if a counterparty is subject to regulatory margin requirements. ISDA has also changed its remediation framework and ongoing monitoring requirements. In April 2025, it concluded a third-party model validation of SIMM. ISDA also published Version 2.7 of the SIMM methodology, which has been effective since 7 December 2024. Effective 12 July 2025, ISDA added a supplementary mid-cycle recalibration to the established primary annual recalibration.

Custodial services are available in multiple forms: tri-party, third-party and hybrid models. Tri-party arrangements include services beyond those of standard third-party arrangements, which only provide settlement, segregation and reporting services. Tri-party services can also include ensuring collateral eligibility, monitoring of concentration limits, applying haircuts, collateral valuation, optimisation of collateral use, substitutions and automation of collateral movement. Hybrid models provide a middle ground between the two traditional model types.

Reconciliation services offered by third-party service providers allow counterparties to reconcile IM amounts across portfolios. For many firms these services are integral to their ability to comply with the WGMR framework. These services are dominated by a small number of highly specialised providers.

Post-trade risk reduction services (PTRRS) provide operational services that, for example, allow firms to compress positions and reduce risk. Note that PTRRS providers may not provide transparency into

the proprietary algorithms they use, which can make it challenging for regulated entities to manage the risk of external providers' products.[6]

The complexity of documentation required to support the IM regime has been met with several efforts to use information technology for the drafting of agreements, converting contract terms into control systems, as well as facilitating the resolution of disputes.

3. Assessment of the adequacy of the WGMR Framework

To assess the adequacy of the WGMR framework now that it has entered a steady state of implementation, the WGMR combined the results of a QIS with the conclusions of several recent analyses of different aspects of the margining framework. These evaluations, discussed in brief below, assessed the effectiveness of the WGMR framework during several recent episodes of stress, including the Covid-19 period and subsequent "dash for cash", the liability-driven investments stress period in 2022 and the 2022 commodity markets turmoil.

3.1 Summary of the assessment carried out in the previous reports

Review of margining practices (BCBS-CPMI-IOSCO, September 2022)[7]

This report assessed the impact of market volatility in March 2020 on margin requirements in derivatives markets. The analysis found a substantial increase in margins, especially VM. Increases in IM were smaller in NCCD markets than in centrally cleared markets.[8] This is due primarily to the model construction and lower responsiveness of ISDA SIMM to volatility changes. This report identified two areas for further WGMR analysis: one focused on streamlining VM processes in non-centrally cleared markets and another focused on evaluating the responsiveness of non-centrally cleared IM models to market stresses.[9]

Streamlining variation margin processes and initial margin responsiveness of margin models in non-centrally cleared markets (BCBS-IOSCO, January 2025)[10]

This report completed the analysis called for in *Review of margining practices*. It was informed by stakeholder outreach sessions with intermediaries/clearing members, end users/clients and third-party service providers in order to discuss potential issues with the WGMR framework.

The report found that issues associated with VM were relatively localised and did not recommend changes to the WGMR framework. It laid out four recommendations to encourage firms to improve and strengthen existing VM processes, including that they consider providing flexibility in bilaterally agreed

[6] For a more comprehensive discussion of the topic, please refer to IOSCO, *Final report on post trade risk reduction services: sound practices for consideration*, FR/10/2024 November 2024.

[7] See BCBS, IOSCO and CPMI, *Review of margining practices,* September 2022, at www.bis.org/bcbs/publ/d537.pdf.

[8] According to data provided by Acadia, a third-party financial market infrastructure provider, and used in *Review of margining practices*, the cumulative value of NCCD margins rose from $1.6 trillion in February 2020 to $5.7 trillion in March, a $4.1 trillion or 256% increase. In both absolute and relative terms, VM calls rose the most, increasing from $0.9 trillion in February to $3.7 trillion in March, a total increase of $2.8 trillion or 310%.

[9] The report identified other areas for follow-up analysis as well. These analyses resulted in publication of *Transparency and responsiveness of initial margin in centrally cleared markets – review and policy proposals* by the BCBS, CPMI and IOSCO and of *Streamlining variation margin in centrally cleared markets – examples of effective practices* by the CPMI and IOSCO.

[10] See BCBS and IOSCO, *Streamlining variation margin processes and initial margin responsiveness of margin models in non-centrally cleared markets,* January 2025, available at www.bis.org/bcbs/publ/d589.pdf.

acceptable collateral in order to limit the liquidity strain associated with providing VM. This is consistent with the design of the WGMR framework, which provides flexibility for firms to accept an array of collateral beyond cash and sovereign debt in order to limit possible liquidity strains on the financial system during stress.

Similarly, the analysis of IM did not find reasons to revise the WGMR framework. ISDA SIMM is used as an internal model to calculate IM in nearly all cases. Changes to the SIMM framework to increase the responsiveness of IM requirements to market shocks indicate that current IM requirements for NCCDs did not unduly contribute to liquidity concerns during recent times of market stress. The report included four recommendations to firms that would help ensure the IM calculations are consistently adequate for market conditions. It proposed that supervisors monitor whether these developments are sufficient to make IM responsive enough to extreme market shocks.

Collectively, the analyses of recent periods of market stress show that, to a large extent, the introduction of the WGMR framework has been successful in reducing counterparty risk by increasing the collateralisation of NCCDs. The increases in the amounts of margin exchanged, coupled with positive feedback from the industry, provide evidence that the WGMR framework is functioning well.

3.2 Summary of QIS methodology

To supplement the analyses described in previous reports and complete its assessment of the framework, the WGMR engaged in an ad hoc QIS exercise in 2024. This exercise was intended to gather harmonised data from different jurisdictions to assess whether the current state of collateralisation of NCCDs generally aligns with the expectations that guided the policy choices set out in the WGMR framework.

3.2.1 Purpose and methodology of the QIS data collection

The 2024 QIS sought information for the end-June 2024 reporting date on: (i) the number and type of counterparties and size of exposures to derivatives (eg notional amounts); (ii) the relative breakdown by different basis for collateralisation (ie clearing, IM or VM); (iii) the relative breakdown of collateral by instruments; and (iv) the most significant counterparties. Depending on the question, IM was further differentiated as posted or collected, and mandatory or voluntary.[11]

The QIS analysis of the WGMR framework aims to evaluate whether there is any evidence of material issues in the implementation of the framework. To assess the level of coverage or protection afforded by the framework, the analysis also examines NCCDs that are not covered by either the WGMR framework or the national implementing legislation due to exemptions or thresholds. Although NBFIs were not included in the QIS, data on banks' counterparties offer insights into NCCD transactions with non-bank counterparties and help identify some features of the counterparty network of margin exchange.

As the 2024 QIS results reflect the margin practices two years after the implementation of the last IM phase and eight years after that of the first IM phase, the QIS results represent a "near-steady state" implementation of the WGMR framework. The report compares the 2024 QIS results with two control scenarios:

[11] Mandatory IM is defined as the amount of IM posted or collected for NCCDs covered by the WGMR framework. By contrast, voluntary IM is defined as the amount of margin posted or collected for NCCDs not covered by the WGMR framework. Both metrics represent amounts effectively exchanged. Mandatory IM includes the minimum amounts required by the WGMR framework and potentially any add-ons. Data collected indicate that mandatory IM is close to the minimum amount required by the WGMR Framework.

(1) The first comparison is the pre-framework scenario, represented by a few data points in the 2012 QIS.[12]

(2) The second is the "voluntary" margining relationships with entities and transactions that are exempted by the WGMR Framework.

However, neither of these are ideal control measures, as the composition of trading relationships could differ across the three scenarios (ie 2024 QIS, 2012 QIS and 2024 QIS with voluntary margining relationships).

3.2.2 Data description

The WGMR 2024 QIS initially received data from 98 firms across 21 BCBS member jurisdictions. Eleven banks did not deliver any data and were excluded. To ensure the results reflect the full implementation of the WGMR framework, responses from member jurisdictions that have not yet implemented the WGMR framework were excluded from all analyses. Finally, one entity was excluded because it reported only centrally cleared data. The final sample comprises 76 banks from 17 member jurisdictions, including major financial centres.

All QIS responses were reviewed by national supervisors and analysis team members prior to their inclusion in the analysis. The QIS data collection was performed on a voluntary basis and was new for the entities. Each analysis in section 3.3 is based on a different sample. The sample compositions are different due to varying levels of data granularity and quality but remain diverse and are composed of a significant number of banks from different member jurisdictions. Since data limitations partially constrained the analysis, it focused on identifying evidence of material issues rather than fully evaluating the framework from limited data.

The analysis focuses on IM rather than VM, as data constraints are particularly pronounced in the VM reported. The market value metrics for VM were interpreted inconsistently and were especially problematic.[13]

3.3 Key findings of the QIS data collection

3.3.1 Analysis of the coverage of the WGMR Framework

Ratio of initial margin to notional amount in the QIS data collection

The IM to notional (IMtN) ratio is a key metric for assessing the collateralisation of transactions in the NCCDs, since the notional amount represents the gross nominal value of all open derivative contracts at the reporting date.[14] In other words, the ratio represents the amount of collateral exchanged in relation to the total value of outstanding derivative contracts. The higher the ratio, the more collateralised the transactions are. This metric uses simple, readily accessible data for which definitions are well standardised between jurisdictions: the notional amounts of NCCDs and the IM. However, while notional amount is a measure of the extent of the trading activity, it is not a measure of exposure or risk.

[12] In July 2012 the BCBS and IOSCO released for consultation a draft proposal for margin requirements on NCCDs. The proposal stated that the WGMR would conduct a QIS to assess the liquidity costs of margin requirements. A QIS data collection was therefore realised with a reference date as of 30 June 2012; 39 respondents shared data with the BCBS.

[13] As some respondents requested clarification of the survey instructions after they had been sent out, the instructions were revised and respondents in some jurisdictions reported with a correct definition. Nevertheless, some respondents, even in a few major jurisdictions, reported based either on the original instructions or on inconsistent interpretations. This made it difficult to ensure the horizontal comparability of each report.

[14] The definition is taken from the BIS data portal.

Participants in the 2012 QIS reported holding around €100 billion[15] in IM against approximately €391 trillion of gross notional NCCDs, resulting in an IMtN ratio of 0.03%. The 2012 QIS estimated that the IMtN ratio would rise by a factor of more than 15 from 0.03% to 0.5%[16] after the implementation of the WGMR framework. However, the 2024 QIS findings indicate an IMtN ratio of 0.16% for IM collected and 0.12% for IM posted, lower than expected.

Several factors can explain why the IMtN ratio is lower than expected. First, the 2012 estimate was uncertain considering that it was not possible to account for certain core features of the standards, for instance: (i) the final framework adopted by BCBS and IOSCO in 2013; and (ii) the implementation of the framework across different jurisdictions. Furthermore, the lower than expected IMtN ratio could be the result of an increasing clearing of transactions or of a margin optimisation process. Large entities may optimise by choosing counterparties based on the margin impact of the transaction.

Another useful indicator in assessing the coverage of the WGMR framework is the IMtN ratio of voluntary margin. If the ratio of voluntary IM is higher than the ratio of mandatory IM, it could indicate that large amounts of NCCDs not covered by the WGMR framework are considered risky by market participants and trigger exchanges of margins on a voluntary basis. Compared with mandatory margins, the sample of entities that reported exchanging voluntary IM is small. The IMtN ratio of these entities is around 0.07% for voluntary IM collected and 0.04% for voluntary IM posted. Both ratios are significantly lower than the IMtN ratios for mandatory margin.

Overall, the 2024 QIS analysis reveals a four- to fivefold increase in the level of margining for NCCDs – materially higher than before implementation of the WGMR framework. While the increase is lower than the 2012 QIS analysis expected, it does not indicate that the calibration of the framework is insufficient, since this could be attributed to optimisation processes undertaken by large entities or to implementation features of the WGMR framework.

Evolution of IM in the ISDA Margin Survey

The impact of the WGMR framework on collateral levels can also be assessed with public data provided by ISDA in the annual ISDA Margin Survey.[17] The data are based on a sample of 32 firms, including 20 Phase 1 entities.

ISDA found that respondents collected $431.2 billion and posted $328 billion of IM for NCCDs in 2024. Global margin regulations required 82% of IM collected and 95% of IM posted; the remainder was an independent amount added by counterparties. The trend shown by ISDA data indicates a sharp increase in IM exchanged since 2017. Indeed, between 2017 and 2024, the absolute amount of IM received grew by 3.3 times and the absolute amount of IM posted by four times.

ISDA data also show that levels of IM exchanged stabilised between 2023 and 2024. The total IM collected was almost unchanged between 2023 and 2024 ($430.9 billion in 2023 and $431.2 billion in 2024), and total IM posted rose by 2.5% compared with 2023. This trend could be seen as evidence of the implementation reaching a "steady state".

[15] Respondents to the 2012 QIS collected a total of roughly €95 billion in IM and posted roughly €6 billion in IM. The sample studied was mainly composed of derivatives dealers that collect and do not post IM. Indeed, before the implementation of the WGMR framework, IM was usually a one-way obligation for end users, a function of the credit quality and the type of exposure (see ISDA Margin Survey 2012). In comparison, the 2024 QIS data collection shows a more balanced level of collateralisation between IM posted and collected.

[16] In total, 2012 QIS respondents in the subsample analysis used for the 0.5% projection were engaged in roughly €159 trillion in notional derivative activity. Regarding notional activity, the 2012 and the 2024 samples for the IMtN analysis are comparable, considering that the notional derivative activity of respondents for the 2024 QIS analysis was around €123 trillion.

[17] ISDA Margin Survey Year-End 2024.

3.3.2 Composition of collateral exchanged

Results from the QIS reveal that a clear majority of VM collateral collected by respondents is in the form of cash, regardless of whether the exchange of VM is mandatory or voluntary (Table 3). This aligns with the findings from outreach sessions conducted for the 2025 WGMR report. That report notes that dealer banks typically prefer cash for VM collateral and that their balance sheet capacity is likely a binding constraint when considering collateral types, since certain collateral types may be more costly to accept.

The composition of IM collateral shows a different pattern. Notably, for NCCDs subject to IM requirements under the WGMR framework, IM collateral comprises predominantly government bonds, followed by cash. However, in the context of voluntary IM exchanged, cash remains the most common type of margin collateral. The frequent use of government bonds as IM collateral for mandatory IM exchange is likely due to the WGMR framework's requirement that IM collected be immediately available to the collecting party and subject to arrangements that protect the posting party in the event of counterparty default. These requirements include the segregation of IM collateral from the IM collector's proprietary assets and restrictions related to the rehypothecation, repledge or reuse of IM collateral.

The impact the WGMR framework's IM requirements have on the collateral choice of NCCD market participants can be seen as evidence that the framework is functioning as intended. Indeed, implementation increased the use of custodians to protect the IM of the counterparties, in practice favouring the use of assets that are the most liquid and can be segregated easily (eg governments bonds). Almost no difference between IM collected and posted can be observed for mandatory IM. More flexibility seems to be observed for voluntary IM.

Composition of types of collateral (after haircuts) Table 3

	Cash	Government bonds	Corporate bonds	Other types of collateral
Mandatory exchange of VM and IM				
VM collected	85%	12%	1%	2%
IM collected	28%	56%	7%	10%
IM posted	30%	56%	4%	10%
Voluntary exchange of VM or IM				
VM collected	79%	14%	2%	5%
IM collected	65%	19%	4%	12%
IM posted	61%	26%	1%	12%

Source: Basel Committee on Banking Supervision quantitative impact study on the margining framework.

3.3.3 IM calculation methodology

The QIS results indicate that the vast majority (over 90%) of IM amounts exchanged are calculated using ISDA SIMM (Table 4), with the remaining amounts primarily calculated by the regulatory grid approach (ie the standardised IM schedule). A further analysis of QIS data confirms that, among banks employing margin models for IM calculation, virtually all of them use SIMM.[18] This finding is consistent with the results of a survey of supervisors conducted during the development of *Streamlining variation margin processes*

[18] Although a few respondents mentioned the use of other (or more than one) model-based calculation methods for IM, the annotations show that some banks employ a secondary model-based method as an internal benchmark but use SIMM in actual IM exchange. One bank also reported using a different proprietary model for prime brokerage clients.

and initial margin responsiveness of margin models in non-centrally cleared markets. The QIS survey responses indicated that firms almost always use SIMM as the model for mandatory IM in accordance with the WGMR framework. This supports the supervisory focus on the mechanisms that have been proposed or implemented by supervised firms and ISDA to improve the responsiveness of SIMM to market shocks. These recommendations were outlined in *Streamlining variation margin processes and initial margin responsiveness of margin models in non-centrally cleared markets* in addition to the recommendations on improving firms' operational and liquidity readiness to effectively implement those changes.

Methodology for calculating the IM amount

Table 4

	Grid	SIMM	Other IM model
IM collected	8%	90%	2%
IM posted	7%	91%	2%

Source: Basel Committee on Banking Supervision quantitative impact study on the margining framework.

3.3.4 Counterparty network analysis

3.3.4.1 By type of counterparty

The distribution by notional amount (Table 5) indicates that a significant majority of the QIS respondents' largest counterparties are banks (over 70%), irrespective of whether the exchange of IM is mandatory or not. Table 5 shows that banks represent 71.9% of the notional amount of respondents' top 25 counterparties for which mandatory IM is collected and 78.2% when IM exchange is voluntary.[19] This is followed by insurance companies (around 14–17%) when IM exchange is mandatory and other financial institutions (around 14%) when IM exchange is voluntary. Each of the remaining counterparty types constitutes less than 10% of the total notional amounts.

The distribution by number of counterparties exhibits a slightly different pattern when compared with the composition by notional amounts (Table 6). For the mandatory exchange of IM, the distribution of QIS respondents' top 25 counterparties is now more concentrated in banks (over 80%). The "other financial" sector has surpassed insurance companies as the second largest category, mainly due to the presence of a few insurance counterparties with large reported notional amounts. Regarding voluntary IM exchange, banks remain the type of counterparty most frequently reported in the top 25, though with a lower proportion (approximately 48%). Another noteworthy difference is the emergence of corporates as the second most common type of counterparty in the top 25 (around 20%), followed by other financial institutions (around 14%).

[19] The respondents were asked to report their top 25 counterparties ranked by notional amounts and to report additional information, such as the type of counterparty.

Distribution of counterparty type among top 25 counterparties

By notional amount Table 5

	Mandatory exchange of IM		Voluntary (or without any) exchange of IM
	Collection of IM	Posting of IM	
Bank	71.9%	72.5%	78.2%
Insurance	14.7%	16.6%	0.2%
Hedge fund	7.3%	4.0%	3.2%
Other financial	6.0%	6.7%	13.9%
Sovereign	-	-	2.7%
Corporate	0.2%	0.2%	1.3%
Pension fund	0.0%	0.0%	0.1%
Other	-	-	0.4%
Total	100%	100%	100%

Source: Basel Committee on Banking Supervision quantitative impact study on the margining framework.

Distribution of counterparty type among top 25 counterparties

By number of counterparties Table 6

	Mandatory exchange of IM		Voluntary (or without any) exchange of IM
	Collection of IM	Posting of IM	
Bank	83.8%	85.1%	47.9%
Insurance	0.9%	1.0%	1.5%
Hedge fund	4.5%	2.3%	2.1%
Other financial	9.8%	9.9%	13.5%
Sovereign	-	-	8.4%
Corporate	0.6%	1.1%	19.9%
Pension fund	0.4%	0.6%	1.4%
Other	-	-	5.2%
Total	100%	100%	100%

Source: Basel Committee on Banking Supervision quantitative impact study on the margining framework.

Across the majority of counterparty types, the IMtN ratios for transactions with mandatory IM exchange are considerably higher than those where IM exchange is voluntary. Specifically, for transactions where IM exchange is mandatory, the IMtN ratios of the key counterparty categories (namely bank, insurance company and other financial institution) range from around 0.2% to 0.4%, surpassing the overall average IMtN ratio reported for this 2024 QIS (0.16% for IM collected and 0.12% for IM posted) and the 2012 QIS (0.03%). These results suggest that the WGMR framework is generally effective in enhancing the level of collateralisation of NCCDs in the form of IM among a variety of counterparty types, thereby reducing counterparty risk.

In addition, for all counterparty types, the results indicate that the amounts of voluntary IM exchanged per counterparty are far smaller than those of mandatory IM. The average notional transaction size of NCCDs per counterparty where only voluntary IM is exchanged is generally smaller than for those in which mandatory IM is exchanged; this is true across all counterparty types. The relative prevalence of smaller transactions under voluntary IM is broadly in line with the design of the WGMR framework, which exempts transactions posing little or no systemic risk. It may reflect the impact of the framework's average aggregate notional amount (AANA) and the IM thresholds.

3.3.4.2 By phase of counterparty

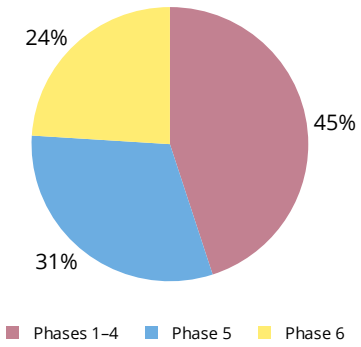
(a) Empirical support for the 2019 amendment to the WGMR Framework

As described in previous sections, the BCBS and IOSCO amended the WGMR framework in 2019 by partitioning Phase 5 and creating an additional Phase 6.[20] This decision addressed concerns that Phase 5, if left unchanged, would bring into scope approximately 1,100 entities participating in 9,500 trading relationships, dwarfing the numbers of prior phases and overwhelming capacity.[21]

The 2024 QIS found that only 45% of respondents fell into phases 1–4 (compare Graph 1), which supports the actions taken.

Distribution of respondents by IM implementation phase — Graph 1

Per cent



Source: Basel Committee on Banking Supervision quantitative impact study on the margining framework.

Additional empirical support comes from the distribution of counterparty relationships. As shown in Table 7, respondents reported 2,178 counterparty relationships with entities in phases 1–4, compared with 2,040 relationships with Phase 5 and 2,780 with Phase 6 counterparties.

[20] See BIS, "Basel Committee and IOSCO agree to one-year extension of the final implementation phase of the margin requirements for non-centrally cleared derivatives", press release, 23 July 2019, www.bis.org/press/p190723.htm.

[21] These numbers were provided by industry and are consistent with studies published by the UK Financial Conduct Authority and the US Commodity Futures Trading Commission based on their regulatory data.

Number of counterparty relationships across IM implementation phases Table 7

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Counterparty count	1,208	234	284	452	2,040	2,780

Source: Basel Committee on Banking Supervision quantitative impact study on the margining framework.

These illustrations provide additional evidence that the decision to split the final phase smoothed onboarding and helped mitigate operational challenges across the market. That is, without intervention, the majority of entities would have been part of the last phase, potentially straining market infrastructure.

(b) Indication of network structure beyond the "hub-and-spoke" assumption

The QIS data generally align with the "hub-and-spoke" model of NCCD market structure, which assumes that major market participants (early-phase entities) act as central hubs with later-phase entities forming peripheral spokes. However, the data also display different trading patterns that suggest a more nuanced market structure. While the WGMR framework itself is agnostic about the market structure, this view has influenced key regulatory decisions, such as using AANA as a simple and risk-based floor and focusing model risk oversight primarily on the largest entities.

The 2012 QIS did not collect information that would confirm or reject this structural assumption. The 2024 QIS therefore provides the first empirical basis for this analysis.

The analysis of counterparty relationships reveals that respondents report the highest number of relationships with counterparties from phases 5 and 6. This pattern is expected, as these phases include the majority of entities that are covered by the WGMR framework. Phase 1 entities also remain well connected to all the other phases, consistent with their expected role as market hubs. Approximately 25% of activity among Phase 4 entities is intra-phase. This intra-phase activity appears to have certain regional concentration, as it drops to 10% after excluding two banks from the same region.

The analysis of notional amounts supports the hub-and-spoke model, with most respondents reporting their largest notional exposures to Phase 1 counterparties, as expected. However, other patterns emerge that point to a more intricate market structure. Phase 5 entities represent a significant exposure for respondents across all phases. This indicates a level of interconnectedness that is not fully captured by the traditional hub-and-spoke model.

A third variant of the analysis examined IM exchanged, which provides a more indicative measure of risk compared with counterparty relationships or notional amounts. The results for IM collected and posted closely mirror each other, so the result presentation is placed on IM collected. Consistent with the findings from the other two measures, Phase 5 entities represent a significant exposure for firms across all phases, except possibly Phase 6.

Possible interpretations and insights

One plausible interpretation of the observed patterns is that the NCCD market contains both global hubs (Phase 1 entities) and regional hubs (Phase 5 entities), departing from a purely centralised network structure. Overall, these initial empirical observations highlight that further assessment would be necessary to better understand the structure of the NCCD market, with more consideration of the heterogeneity of the counterparty types.

In addition, the significance of Phase 5 entities may also point to greater heterogeneity in the derivatives markets, not only in participant size but also in business models. Many buy-side entities in the derivatives markets, such as investment funds and commercial banks, are typically classified under later phases of the WGMR framework. These entities usually engage in fixed-income derivative transactions and

diversify exposures across multiple counterparties, including major domestic and international banks and specialised swap dealers.

3.3.5 Exemption analysis

The QIS analysis included a section dedicated to the exemptions of the WGMR framework.[22] The framework includes multiple exemptions and exclusions to strike a risk-based balance between the benefits of addressing counterparty risk on the one hand and liquidity risk and other operational costs of requiring collateralisation on the other hand.

The analysis indicates that only 23% of NCCD notional amounts are not covered by the WGMR framework;[23] in other words, 77% are required to exchange margins. Of notional amounts for which mandatory IM is not exchanged, about a half is exempted due to two size-related thresholds (the AANA threshold and the IM threshold). Legacy contracts that started before the implementation of the WGMR framework and not required to exchange margins account for about 15%. Overall, the contract types exempted in the WGMR framework explain 24% of exempted notional amounts,[24] while national implementation exemptions account for 10%.

Four main conclusions can be drawn from these numbers:

- First, most of the exemptions are linked to the design of the WGMR framework, which was intended to require margins depending on the level of activity in NCCDs.
- The size of legacy contracts in exempted NCCDs does not contradict the idea that the system is approaching a steady state, as it represents a low proportion of all exempted notional amounts.
- The low percentage of transaction exemptions attributed to national implementations of the WGMR framework suggests a consistent implementation of the international standards by the different jurisdictions.
- Finally, no single exemption accounts for more than a third of the exempted total, suggesting that the standard does not include any severely miscalibrated exemptions.

4. Remaining and future challenges – industry perspectives

The 2024 QIS included a qualitative section in which respondents were asked to describe challenges they encountered during the implementation of the standard for IM and VM, as well as their views on the topic.

While industry's assessment is generally positive, some respondents expressed difficulties encountered during the implementation of the standard and the issues experienced during the various stress periods since 2020. Most QIS respondents (Graph 2) indicated that they have not encountered major challenges in implementing the margin rules, with respect to either IM or VM. Banks that experienced challenges on the IM side (30%) specifically noted that implementing the WGMR framework required setting up significant internal processes. They highlighted as especially burdensome the protection of the

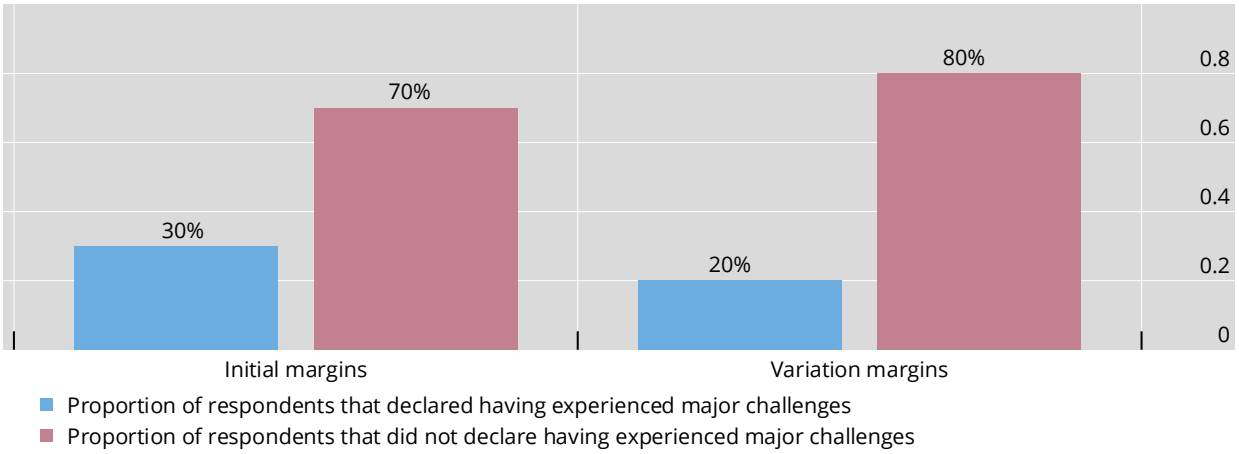
[22] In the 2024 QIS, exemptions are classified into the following five categories: (i) the counterparty was exempted because their AANA did not exceed EUR 8 billion; (ii) AANA exceeded EUR 8 billion but exposure did not exceed the EUR 50 million IM threshold; (iii) the NCCD was a legacy contract; (iv) the NCCD was exempted by the WGMR Framework; or (v) the NCCD was exempted by national implementation.

[23] This number represents the total amount of NCCDs reported as exempted by respondents, divided by the total amount of NCCDs reported for the sample of entities.

[24] For instance, physically settled FX forwards and swaps.

IM through custodians, considered the most robust protection by the WGMR framework.[25] Only one bank in the entire sample reported difficulties accessing IM in the event of counterparty default.[26] Some entities also stated that they had experienced difficulties determining whether a counterparty was within scope, noting challenges ascertaining counterparties' AANA exposures. Fewer issues were identified by banks that experienced challenges on the VM side (20%). Those issues identified concentrated on the burden of implementing new processes and documentation.

Feedback from respondents on their experience of implementing the standard — Graph 2



Source: Basel Committee on Banking Supervision quantitative impact study on the margining framework.

More than 90% of respondents indicated they did not anticipate short-term changes to their derivatives business in response to the implementation of the standard. Some mentioned that the WGMR framework could influence market participants' behaviour by incentivising them to focus on contracts outside its scope or to focus on a small number of counterparties in order to set margins only a few times. Overall, market participants believe that the majority of the impact has already been experienced and anticipate no significant business changes.

These results align with the industry perspective collected by the BCBS and IOSCO during the development of *Streamlining variation margin processes and initial margin responsiveness of margin models in non-centrally cleared markets*. Indeed, market participants reported no evidence of a need to amend the WGMR framework, because no significant issues have been identified in the margin standard. As described in section 3.1, those industry outreach sessions resulted in dedicated recommendations to enhance VM and IM processes.

5. Conclusion

The WGMR framework has been widely adopted and implemented. More than 10 years after the publication of the requirements, implementation of the framework has generally reached a steady state.

The report finds no material issues in the WGMR framework using ad hoc QIS data collection and a qualitative survey circulated to WGMR members. The amount of IM exchanged for NCCDs is significantly

[25] Commentary 5(i) of requirement 5.

[26] A dedicated question was included in the QIS survey.

higher than it was before the implementation of the framework, and analysis of the transactions outside the scope of the WGMR does not reveal any severely miscalibrated exemption. The network of counterparties is mainly composed of banks, but the structure of the relationships is less concentrated among Phase 1 counterparties than expected. No authorities intend to undertake any regulatory initiatives that would result in material deviations from the WGMR framework. This is consistent with the findings in *Streamlining variation margin processes and initial margin responsiveness of margin models in non-centrally cleared markets*, which included several recommendations to support collection of adequate IM and improve and strengthen VM processes but did not recommend changes to the WGMR framework.

In light of market developments, the ongoing evolution of ISDA processes, certain limitations in available data and authorities' continued evaluation of margin frameworks, the WGMR recommends regular monitoring in the form of supervisory information exchange and the sharing of experiences among its members.

Appendix: Background on the WGMR and the regulatory role of margin requirements

Background on the WGMR and WGMR Framework

In response to the 2008 Great Financial Crisis, the G20 initiated a reform programme to reduce the systemic risk from OTC derivatives. The programme comprised four elements:

1. Standardised OTC derivatives should be traded on exchanges or electronic platforms, where appropriate.
2. Standardised OTC derivatives should be cleared through CCPs.
3. OTC derivatives contracts should be reported to trade repositories.
4. Non-centrally cleared derivatives contracts should be subject to higher capital requirements.

At the 2011 G20 meeting in Cannes, the G20 agreed to add margin requirements on NCCDs to the reform programme and called upon the BCBS and IOSCO to develop consistent global standards for these margin requirements. In October 2011, the BCBS and IOSCO established the WGMR, in consultation with the BIS CPMI. The WGMR framework was published in 2013. The framework has largely been implemented, as shown in Table 2 in Section 2.1.

The WGMR was tasked with considering the framework as it relates to other margin standards and regulatory initiatives in order to assess the costs and benefits of the framework as well as its overall efficacy and appropriateness. The group was expected to look at the results of studies conducted on margin and undertake its own QIS; to consider the framework for ongoing monitoring, such as validation and backtesting; and to evaluate cross-border interactions, ensuring they are compatible with the framework's goals.

The WGMR also serves as a forum for consultation and coordination among its members. This coordination led to the issuance of a statement on VM in 2017[27] and the creation of an additional implementation phase for the WGMR framework, namely Phase 6. This additional phase aimed to accommodate both the large number of participants needing to be onboarded in Phase 5 and delays caused by operational difficulties arising from the Covid-19 pandemic (see Table 1 for more information on implementation phases).[28]

In 2019 and 2020, the WGMR also helped coordinate regulatory responses during the risk-free rate reform[29] process by: (i) determining that necessary contract amendments, such as incorporating a fallback rate, would not result in loss of legacy status; and (ii) by recommending that supervisors consent to the use of proxies in initial margin models (eg ISDA SIMM) for calibration to stress periods.

The role of margin requirements in the regulatory context

Margin complements capital in supporting financial stability. Capital ensures firms are capable of absorbing losses, but it is "survivor pay", meaning the use of capital to absorb losses in default depletes the surviving firm's resources. Margin is "defaulter pay", since collateral provided by the defaulting entity provides the loss-absorbing capacity. In this way, margin complements capital and partially helps to

[27] IOSCO, "Statement on variation margin implementation, 23 February 2017, available at www.iosco.org/library/pubdocs/pdf/IOSCOPD556.pdf.

[28] BCBS and IOSCO, *Margin requirements for non-centrally cleared derivatives*, requirement 8, April 2020.

[29] See BCBS "Benchmark rate reforms", newsletter, February 2020, available at www.bis.org/publ/bcbs_nl24.htm.

distribute the cost of resilience to the defaulting party. Margin is also dynamic, in that the margin requirements on each portfolio can be rapidly adjusted in response to changing risk exposures.

Implementation of the WGMR framework reduces systemic risk and promotes central clearing. There are currently hundreds of trillions of NCCD notional dollar amounts,[30] and only standardised derivatives are suitable for central clearing. These NCCDs pose systemic contagion and spillover risks. Central clearing imposes costs; it is important to ensure appropriate incentives exist through NCCDs by setting margins appropriately to reflect the generally higher risk associated with these derivatives. Critically, NCCDs provide important flexibilities that are intended to support centrally cleared derivatives and thus ensure margining regulatory initiatives are not penalising or reducing their use. Rather they are intended to promote system resilience while preserving their utility.

IM and VM promote systemic resilience by reducing counterparty risk in NCCDs. VM limits the build-up of uncollateralised exposures within the financial system by requiring collateral to cover the changes in the value of the derivatives. IM is intended to cover the potential future exposure that could arise from changes in the value of NCCDs between a default and close out of the position.

It is important to measure the benefits of margin requirements against their costs. A key consideration is the trade-off between counterparty risk and liquidity risk: increased demand for liquid and high-quality assets that can be posted as collateral can exacerbate liquidity and funding strains on the financial system. That is why ISDA SIMM is calibrated twice annually and uses lagged market data. This means recent market events are not always incorporated into the calibration, limiting procyclicality.

[30] See BIS Data Portal, OTC derivatives statistics, 13 May 2025, OTC derivatives statistics publication table: BIS,DER_D5_1,1.0