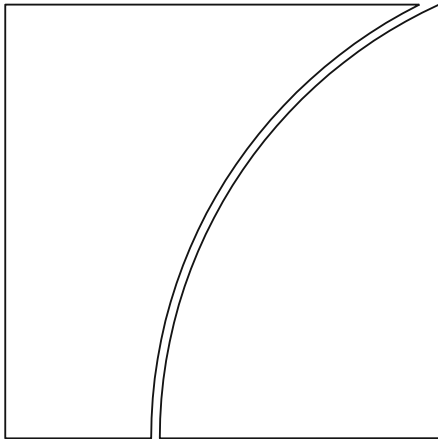


Committee on
Payments and Market
Infrastructures

Board of the International
Organization of Securities
Commissions



Implementation
monitoring of the PFMI:
Level 3 assessment on
general business risks

November 2025



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Abbreviations

BIS	Bank for International Settlements
CCP	Central counterparty
CPMI	Committee on Payments and Market Infrastructures
CSD	Central securities depository
EN	Explanatory Note
FMI	Financial market infrastructure
IMSG	Implementation Monitoring Standing Group
IOSCO	International Organization of Securities Commissions
KC	Key Consideration
LNAFE	Liquid net assets funded by equity
PFMI	Principles for financial market infrastructures
PS	Payment system
SSS	Securities settlement system
TR	Trade repository

1. Executive summary

This report represents the fifth¹ Level 3 (L3) assessment of the consistency in outcomes of FMIs' implementation of the *Principles for financial market infrastructures* (PFMI). It focuses on general business risk and was carried out during 2023–25 by the Implementation Monitoring Standing Group (IMSG) and a team of experts from CPMI and IOSCO member jurisdictions.

While L3 assessment reports do not include ratings, they do include key findings. In this vein, the IMSG has identified six *serious issues of concern*² in the four areas of:

- (i) determining FMIs' needs for liquid net assets funded by equity (LNAFE) to cover potential losses arising from general business risk and for implementing plans for recovery and orderly wind-down;
- (ii) holding LNAFE in addition to resources held for risks other than general business risk;
- (iii) recovery and orderly wind-down planning for general business risk; and
- (iv) plans for raising additional equity in case of capital shortfalls.

The IMSG has also identified one *issue of concern* related to FMIs not adequately considering all relevant sources of general business risk. In addition, the IMSG noted several *observations* in relation to material differences in FMIs' practices.³

1.1 Scope of the assessment

The objective of this assessment was to assess the consistency of implementation of the PFMI general business risk principle (Principle 15) across all FMI types. While there is a more developed understanding of FMIs' policies and methodologies for addressing risks arising from participant default, there has been less understanding of FMIs' practices to address general business risk and losses resulting from general business risk.

The assessment was based on PFMI Principle 15, including Key Considerations (KCs) 1–5, and Principle 3, KC 4 to the extent that recovery and orderly wind-down plans relate to general business risk-related loss scenarios. The assessment was informed by relevant parts of CPMI-IOSCO's *Recovery of financial market infrastructures* (Recovery Guidance).⁴

¹ The previous L3 reports are: CPMI-IOSCO, *Implementation monitoring of PFMI: Level 3 assessment – Report on the financial risk management and recovery practices of 10 derivatives CCPs*, August 2016; CPMI-IOSCO, *Implementation monitoring of PFMI: follow-up Level 3 assessment of CCPs' recovery planning, coverage of financial resources and liquidity stress testing*, May 2018; CPMI-IOSCO, *Implementation monitoring of the PFMI: Level 3 assessment of FMIs' business continuity planning*, July 2021; and *Implementation monitoring of the PFMI: Level 3 assessment on financial market infrastructures' cyber resilience*, November 2022. These reports are available on the CPMI and IOSCO websites.

² The findings of the assessment are described as “(serious) issues of concern” if they relate to an identified gap or shortcoming in the outcomes of FMIs' implementation against the standards in the principles and KCs in the PFMI. While all issues of concern should be addressed, a serious issue of concern is an identified gap or shortcoming that should be addressed with the highest priority.

³ “Observations” relate to differences in implementation outcomes across FMIs (rather than consistency with the PFMI), which could result in material differences in resilience across FMIs. Given differences in the depth and scope of FMI responses, as well as the range of FMIs' practices, observations are described by referring to relevant examples of FMIs' responses rather than necessarily describing the practices of all 34 participating FMIs.

⁴ See CPMI-IOSCO, *Recovery of financial market infrastructures*, revised July 2017, www.bis.org/cpmi/publ/d162.pdf and www.iosco.org/library/pubdocs/pdf/ioscopd569.pdf. An earlier version of this report was published in October 2014.

A total of 34 FMIs from 27 jurisdictions, consisting of systemically important PSs, CCPs, CSDs/SSSs, and TRs, participated in the assessment. None of these assessed FMIs are central bank-operated FMIs, to which KCs 2–5 of Principle 15 are not applicable.⁵

The FMIs participated on a voluntary basis and responded to a self-assessment questionnaire launched in August 2023, as well as to three rounds of follow-up questions that were conducted in November 2023, January 2024 and June 2024. In addition, the Assessment Team shared its initial findings with the FMIs in April 2025 for feedback and received further FMI input. The CPMI and IOSCO would like to thank the participating FMIs for their cooperation during this exercise.

L3 assessments are peer benchmarking exercises and not supervisory exercises. Accordingly, the focus of the report is on the consistency of outcomes of implementation of the relevant principles and KCs across the group of FMIs as a whole, rather than on each individual FMI's specific implementation outcomes. As noted in Responsibility D of the PFMI, it is the responsibility of the relevant regulatory, supervisory and oversight authorities to ensure that the principles are observed by individual FMIs. Furthermore, the findings in this report are based on the IMISG's review of the 34 FMIs' responses to the survey questionnaire and may not necessarily be representative of all FMIs. It is further acknowledged that the use of a survey also has the limitation that FMIs may interpret the questions in different ways.⁶

1.2 Key findings of the assessment

All FMIs (including those that did not participate in this assessment), as well as their supervisors, regulators and overseers, should consider whether any serious issues of concern identified in this report are relevant to them. In keeping with their respective regulation, supervision and oversight responsibilities, authorities are expected to ensure that the PFMI are applied consistently in their respective jurisdictions and implemented by individual FMIs, as noted in Responsibility D of the PFMI. The key findings of the exercise with respect to the FMIs that participated are summarised below.

Serious issues of concern

1. Some FMIs do not consider their general business risk profile in determining the amount of LNAFE, which calls into question whether those FMIs are holding sufficient LNAFE.
2. Some FMIs do not consider the amount of resources needed to implement their recovery or orderly wind-down plans in determining their LNAFE requirement.
3. A few FMIs do not hold LNAFE in addition to resources held to cover participant defaults or other risks covered under the financial resources principles.
4. A few FMIs do not have a recovery plan at all and therefore also do not have a recovery plan addressing general business risk.
5. Some FMIs do not have an orderly wind-down plan that addresses general business risk.
6. Some FMIs do not maintain an explicit plan for raising additional equity in case of capital shortfalls.

⁵ See CPMI-IOSCO, *Application of the Principles for financial market infrastructures to central bank FMIs*, August 2015, Section 3 www.bis.org/cpmi/publ/d130.pdf and www.iosco.org/library/pubdocs/pdf/IOSCOPD501.pdf.

⁶ The findings reflect the Assessment Team's best efforts to accurately interpret survey responses based on the information received and the follow-up engagement with the FMIs.

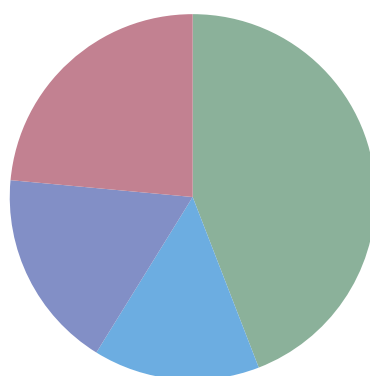
Issues of concern

1. A few FMIs do not comprehensively identify, monitor, and manage all sources of general business risk.

The above (serious) issues of concern highlight significant shortcomings in FMIs' approaches to effectively addressing general business risk. While all issues of concern identified in this assessment constitute gaps vis-à-vis the PFMI that should be addressed, serious issues of concern should be dealt with as matters of highest priority. Graph 1 shows the relevance of identified (serious) issues of concern for participating FMIs.

Relevance of the identified serious issues of concern for the surveyed FMIs

Graph 1



Number of FMIs:

- not affected by any issue of concern or serious issue of concern
- affected by one issue of concern or serious issue of concern
- affected by two issues of concern or serious issues of concern
- affected by three or more issues of concern or serious issues of concern

Source: CPMI-IOSCO survey of FMI general business risk management, 2023–24.

At the same time, as noted above, L3 assessments are peer benchmarking exercises and not supervisory exercises. Accordingly, the focus of the report is on the consistency of outcomes of implementation of the relevant principles and KCs across the group of FMIs as a whole, rather than on specific implementation outcomes for each individual FMI.

The report also identifies observations that relate to differences in implementation outcomes across FMIs (rather than consistency with the PFMI), which could result in material differences in resilience across FMIs.

Observations

1. Some FMIs do not classify some or all potential types of losses related to general business risk as general business risk. Not recognising certain types of risk – such as legal, operational, custody and investment risks – as potentially leading to general business losses could affect FMIs' implementation of Principle 15 when identifying, monitoring, and managing the related risks.
2. FMIs use materially different management and control systems to identify, monitor, and manage general business risk in line with KC 1.
3. FMIs use materially different approaches to assess their ability to either (a) avoid, reduce or transfer specific business risks or (b) accept and manage those risks.

4. FMI have varying interpretations of the term LNAFE, which may lead to material differences in the composition and calculation of FMIs' LNAFE.
5. FMI use a range of processes for reviewing and updating the amount of LNAFE relative to their general business risks.
6. FMI have a wide range of practices for identifying their critical services, which could lead to different outcomes for recovery or orderly wind-down planning across FMIs and calculations of the LNAFE required to implement these plans.
7. FMI use a range of methods for determining the minimum amount of six months of current operating expenses, which could lead to different outcomes in calculating LNAFE needs.
8. The depth of analysis confirming the adequacy of recovery scenarios and tools for general business risk varies across FMIs, which may lead to material differences in the viability of FMIs' recovery plans.
9. The use and definition of triggers for recovery from scenarios related to general business risk vary significantly across FMIs, which may lead to material differences in FMIs' processes for information-sharing and escalation before implementing recovery plans.
10. FMIs' approaches to orderly wind-down planning for general business risk differ materially, including the types of wind-down scenarios used, the testing and review of orderly wind-down plans with stakeholders and the provision of transparency on orderly wind-down planning to FMIs' members.
11. FMI hold materially different assets as LNAFE. They also differ significantly in their interpretations of how liquid an asset needs to be in order to be eligible as LNAFE.
12. Few of the participating FMIs appear to have processes for regularly assessing whether their assets held as LNAFE are of high quality and sufficiently liquid.
13. Planning for raising additional equity differs significantly across FMIs, for example in the processes and analysis used to determine the plan's viability, and in the number and types of tools included.

2. Introduction

2.1 Objective of the L3 assessment

In April 2012, the Bank for International Settlements Committee on Payment and Settlement Systems (CPSS)⁷ and the International Organization of Securities Commissions (IOSCO) published the *Principles for financial market infrastructures* (PFMI).⁸ The PFMI set standards for the design and operation of key financial market infrastructures (FMIs) in order to enhance their safety and efficiency and, more broadly, to limit systemic risk and foster transparency and financial stability. The principles apply to all systemically important payment systems (PSs), central securities depositories (CSDs), securities settlement systems (SSSs), central counterparties (CCPs) and trade repositories (TRs) (collectively, FMIs). These FMIs clear, settle and record transactions in financial markets.

⁷ The Committee on Payment and Settlement Systems (CPSS) changed its name to the BIS Committee on Payments and Market Infrastructures (CPMI) on 1 September 2014. References to reports published before that date use the Committee's old name.

⁸ See CPSS-IOSCO, *Principles for financial market infrastructures*, April 2012, www.bis.org/cpmi/publ/d101.htm and www.iosco.org/library/pubdocs/pdf/IOSCOPD377-PFMI.pdf.

Following the publication of the PFMI, the CPMI and IOSCO agreed to monitor their implementation in 28 jurisdictions that are members of the CPMI or IOSCO via a dedicated standing group, the Implementation Monitoring Standing Group (IMSG). Implementation is being monitored on three levels:

- (i) Level 1 (L1) to assess whether jurisdictions have completed the process of adopting the legislation, regulations, and other policies that will enable them to implement the PFMI.
- (ii) Level 2 (L2) to assess whether the content of legislation, regulations, and policies is complete and consistent with the PFMI.
- (iii) L3 to assess whether there is consistency in PFMI implementation outcomes.

The L3 assessments are peer benchmarking exercises and not supervisory exercises. The reviews focus on the consistency in outcomes of implementation of relevant principles and KCs across the group of participating FMIs as a whole rather than on each individual FMI's specific implementation outcomes. As a result, in contrast to L2 implementation monitoring assessments, this L3 review does not include formal ratings of observance. There are three key inputs to the assessment:

- identification of implementation measures and approaches across FMIs;
- consideration of implementation outcomes' consistency with the relevant principles and KCs upon which they are based; and
- comparison of implementation outcomes across FMIs, with attention paid, where possible, to the drivers, degree and implications of observed variations.

2.2 Scope of this review

The overarching objective of this L3 assessment was to review FMIs' implementation of the general business risk principle, based on Principle 15 (including KCs 1–5⁹) as well as on KC 4 of Principle 3 to the extent that recovery and orderly wind-down plans relate to general business risk-related loss scenarios. The assessment was informed by relevant parts of the CPMI-IOSCO Recovery Guidance, notably sections 2.2, 2.4, 3.3 and 4.6. For reference, the relevant extracts are included in Annex A.

3. Process and methodology

This L3 assessment proceeded in three main stages comprising: (i) setting the jurisdictional and FMI coverage of the exercise; (ii) data collection and analysis by the IMSG; and (iii) review of assessment findings by the IMSG and the CPMI-IOSCO Steering Group.

Assessment findings are presented in terms of:

- (i) *(serious) issues of concern:*

An "issue of concern" is an identified gap or shortcoming in the outcomes of FMIs' implementation against the standards in the relevant principle or KC that should be addressed.

A "serious issue of concern" is an identified gap or shortcoming that should be addressed with the highest priority.

- (ii) *observations*

⁹ As noted above, KCs 2–5 of Principle 15 are not applicable to central bank FMIs. See CPMI-IOSCO, *Application of the Principles for financial market infrastructures to central bank FMIs*, August 2015, section 3.

An “observation” relates to differences in implementation outcomes across FMIs (rather than consistency with the PFMI), which could result in material differences in resilience across FMIs.

This distinction in the characterisation of the findings is consistent with the approach taken in previous L3 assessments.

3.1 Jurisdiction/FMI coverage

A total of 34 FMIs from 27 jurisdictions participated in this L3 assessment. They consisted of PSs, CSDs/SSSs, CCPs and TRs. Participating FMIs were selected based on a number of criteria, including:

- one (or more) FMI(s) per jurisdiction;
- balancing jurisdictional and FMI coverage on the one hand, and complexity and volume of work on the other hand; and
- ensuring the sample size is sufficient for practical anonymisation.

3.2 Data collection and analysis

The 34 FMIs participated on a voluntary basis and responded to a detailed survey with information as of 11 August 2023. The survey included questions intended to inform both this assessment and the CPMI-IOSCO Policy Standing Group’s development of the consultative report *FMIs’ management of general business risks and general business losses: Further guidance to the PFMI*.¹⁰

Following the Assessment Team’s initial analysis of the survey responses, there were further rounds of engagement and follow up questions with the participating FMIs between November 2023 and April 2025 to obtain more information and better clarity around FMIs’ general business risk practices, policies and procedures.

4. Analysis of results

This section presents the main findings of the IMMSG’s review of the implementation of the general business risk principle across participating FMIs. As noted earlier, in doing this assessment, the IMMSG has not conducted a supervisory review or examination. Accordingly, this section focuses on the consistency in the outcomes of implementation of relevant principles and KCs across participating FMIs.

The IMMSG has grouped its findings (issues of concern and observations) into six broad areas of the general business risk principle:

- identification, monitoring, and management of general business risk (section 4.1);
- adequate amounts of LNAFE in line with the general business risk profile (section 4.2);
- adequate amounts of LNAFE to implement recovery or orderly wind-down plan (section 4.3);
- recovery and orderly wind-down planning for general business risk (section 4.4);
- quality and liquidity of assets held as LNAFE (section 4.5); and
- plan for raising additional equity (section 4.6).

¹⁰ See CPMI-IOSCO, *Consultative report on FMIs’ management of general business risks and general business losses: Further guidance to the PFMI*, November 2025, available at www.bis.org/cpmi/publ/d229.htm.

4.1 Identification, monitoring, and management of general business risk

4.1.1 Considering relevant sources of general business risk

Issue of concern

A few FMIs do not comprehensively identify, monitor, and manage all sources of general business risks.

A few FMIs' responses suggested that they do not comprehensively identify, monitor, and manage all sources of general business risks as they do not consider some types of risk (general business, legal, investment or custody risk) as potentially leading to business-related losses (Explanatory Note (EN) 3.15.1).

Reasons given by these FMIs for not considering certain types of risk were that they mitigated these risks, for example through their policies for investment risk or custody risk, or that the risks were difficult to quantify. At least one FMI considered that it does not face losses from general business risk, as under an intra-group arrangement, all of the FMI's profits and losses are passed on to the parent company.

These approaches appear to be inconsistent with the standards set forth in Principles 3 and 15. KC 1 of Principle 15 states that FMIs "should have robust management and control systems to identify, monitor and manage general business risks". Also, EN 3.15.3 refers to the need for an FMI to understand its general business risk profile in order to assess its ability to either (a) avoid, reduce, or transfer specific business risks or (b) accept and manage those risks. The risk that certain types of general business losses materialise might be low due to mitigants; however, low risk is not zero risk. Therefore, although FMIs have made an effort to mitigate the risk of losses, they should also consider the possibility that, despite those efforts, losses may nevertheless occur and would need to be managed.

Observation

Some FMIs do not classify some or all potential types of losses related to general business risk (as set out in EN 3.15.1) as general business risk. Not recognising certain types of risk – such as legal, operational, custody and investment risks – as potentially leading to general business losses could affect FMIs' implementation of Principle 15 when identifying, monitoring, and managing the related risks.

Some FMIs do not classify some or all categories of potential losses related to general business risk, such as losses that may result from legal, operational, custody or investment risk, as general business risk.

FMIs' responses indicate that this practice minimises overlaps or double-counting between different risk types, that certain risks such as investment and operational risks are monitored separately or that domestic regulations establish separate capital requirements for different categories of risk.

However, failure to recognise certain types of losses as sources of general business risk could potentially affect FMIs' implementation of Principle 15 when identifying, monitoring, and managing the related risks.

4.1.2 Management and control systems to identify, monitor, and manage general business risk

Observation

FMIs use materially different management and control systems to identify, monitor, and manage general business risk in line with KC 1.

KC 1 of Principle 15 states that FMIs should have robust management and control systems to identify, monitor, and manage general business risks. For identifying general business risk, EN 3.15.2 elaborates that an FMI should "assess and thoroughly understand its business risk and the potential effect that this risk could have on its cash flows, liquidity, and capital positions". EN 3.15.2 further suggests that an FMI

should consider a combination of tools and lists a number of tools as examples (risk management and internal control assessments, scenario analysis and sensitivity analysis).

The FMIs have materially different types of management and control systems to identify, monitor, and manage general business risk.

Most of the participating FMIs indicated that they use scenario analysis or stress testing to understand their general business risk. Some of those FMIs described using the help of external experts (including external audits and supervisory reviews), guidance, research or benchmarks to develop or calibrate their scenarios.

Many FMIs mentioned combining the use of scenario analysis or stress testing with other tools and processes such as overall risk management processes, budgeting and business planning processes, or business continuity planning and testing.

A few FMIs do not use dedicated scenario analysis or stress testing to understand their general business risk and instead rely on other tools such as general risk management processes and budgeting and business planning processes.

Observation

FMIs use materially different approaches to assess their ability to either (a) avoid, reduce or transfer specific business risks or (b) accept and manage those risks in line with EN 3.15.3.

EN 3.15.3 states that an FMI “should clearly understand its general business risk profile so that it is able to assess its ability either (a) to avoid, reduce, or transfer specific business risks or (b) to accept and manage those risks”. Participating FMIs indicated that they use materially different approaches to avoid, reduce, transfer, or manage general business risk.

The varying approaches used by participating FMIs’ to avoid, reduce or transfer risk fall into five broad categories: procedures and controls; insurance; transfer of risks to participants; management of third-party dependencies; and risk mitigation through financial and business planning processes (eg not taking on particular transactions, cost reduction, fee increases). Some FMIs rely on only one approach to avoid, reduce, or transfer risk, while other FMIs listed between two and four approaches.

In addition, many FMIs stated that they expect to use their capital or their plans for recovery or orderly wind-down. Most of those FMIs stated that they would rely on capital and recovery or orderly wind-down plans in the context of managing risks that cannot be avoided. Some other FMIs considered using their capital or their plans for recovery or orderly wind-down as standing tools to avoid, reduce or transfer general business risk, rather than as fallback options in case ongoing risk mitigants fail. This may lead to different levels of resilience across FMIs.¹¹

4.2 Adequate amounts of LNAFE to cover general business risk in line with the general business risk profile

4.2.1 Considering the general business risk profile in determining LNAFE needs

Serious issue of concern

Some FMIs do not consider their general business risk profile in determining the amount of LNAFE, which calls into question whether those FMIs are holding sufficient LNAFE in line with KC 2.

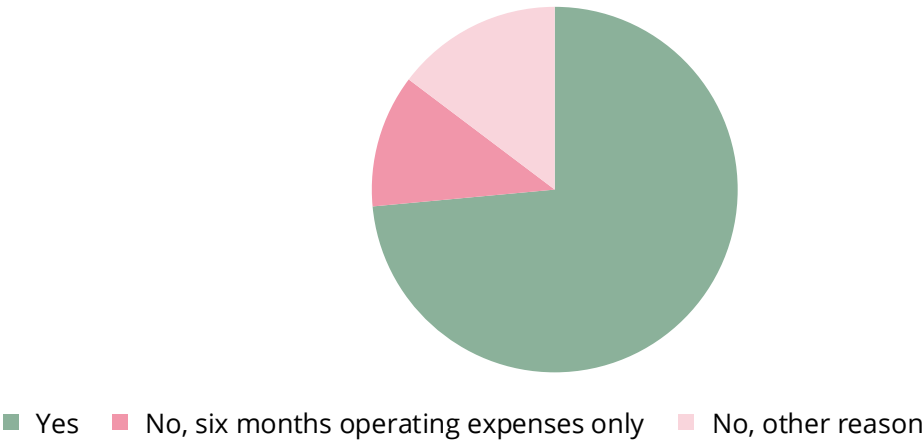
¹¹ EN 3.15.4 sets out that “an FMI should minimise and mitigate the probability of business-related losses and their impact on its operations across a range of adverse business and market conditions”.

KC 2 of Principle 15 states that “an FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.”

However, as shown in Graph 2, some FMIs indicated that they do not consider their general business risk profile in determining the amount of LNAFE to hold, which calls into question whether those FMIs are holding sufficient LNAFE in line with KC 2.

A few of these FMIs highlighted that they only consider six months of current operating expenses without considering their general business risk profile in determining the amount of LNAFE to hold. A few FMIs’ responses indicated that they do not consider certain general business risks (relevant to their business risk profile) for the purpose of determining the amount of LNAFE, stating that the risks are not quantifiable. A few FMIs consider that they have sufficient mitigants for certain general business risks in place, such as through legal protections or their risk mitigation frameworks, but they do not necessarily consider the potential losses that could occur, and therefore the LNAFE held might not be sufficient for purposes of KC 2.

Does the FMI consider its general business risk profile in determining LNAFE? Graph 2



Source: CPMI-IOSCO survey of FMI general business risk management, 2023–24.

4.2.2 FMIs’ interpretations of the term LNAFE and processes for reviewing and updating LNAFE

Observation

FMIs have varying interpretations of the term LNAFE, which may lead to material differences in the composition and calculation of FMIs’ LNAFE.

The PFMI do not define LNAFE, although KC 2 of Principle 15 includes some examples of equity such as common stock, disclosed reserves, or other retained earnings; and KC 4 notes that assets should be of high quality and sufficiently liquid.

The assessment showed that FMIs have different interpretations of the term LNAFE, which may lead to material differences in the composition and calculation of FMIs’ LNAFE. Around half of the FMIs defined LNAFE in terms of either liquid assets or equity, while some others defined it in terms of both

aspects. A few FMIs defined LNAFE in terms of their balance sheet items (eg current assets less current liabilities).

Observation

FMIs use a range of processes for reviewing and updating the amount of LNAFE relative to their general business risks.

EN 3.15.8 notes that “to ensure the adequacy of its own resources, an FMI should regularly assess and report its liquid net assets funded by equity relative to its potential business risks to its regulators”.¹²

Participating FMIs described a range of approaches and governance processes for reviewing and updating LNAFE relative to potential business risks. Some FMIs indicated they have dedicated processes for a periodic review of LNAFE, including review by their board of directors or risk committees (eg annually or semiannually). A few FMIs continuously monitor LNAFE relative to their required amount of LNAFE. Many other FMIs indicated they rely on their enterprise risk management frameworks or governance processes for their recovery plans, orderly wind-down plans or capital plans, including periodic updates and approvals of those frameworks and plans. However, it is unclear from the FMIs’ responses whether (and if so, how) the amount of LNAFE is reviewed and updated as part of such processes.

4.3 Adequate amounts of LNAFE to implement recovery or orderly wind-down plan

4.3.1 Considering implementation of recovery or orderly wind-down plan in determining LNAFE

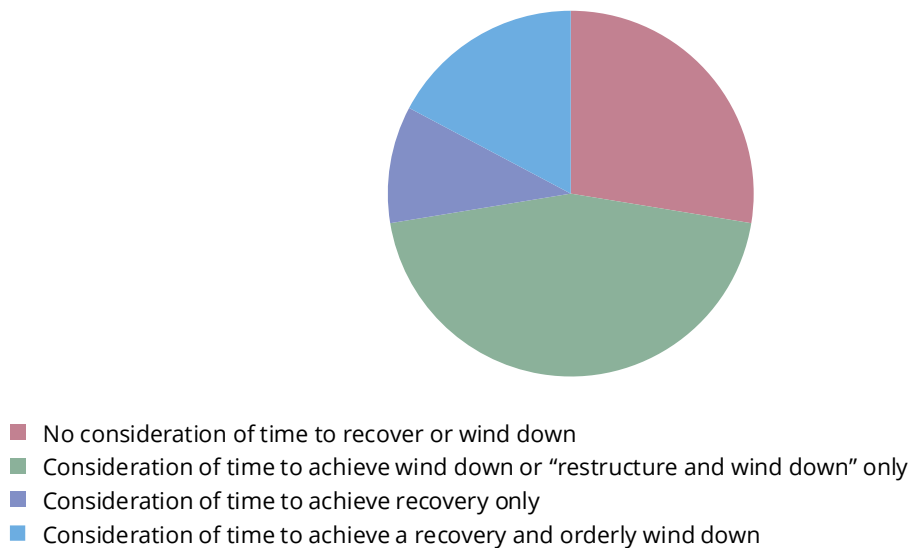
Serious issue of concern

Some FMIs do not consider the amount of resources needed to implement their recovery or orderly wind-down plans in determining their LNAFE requirement.

KC 2 of Principle 15 calls for FMIs to determine the amount of LNAFE they hold in view of their general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of their critical operations or services. In addition, KC 3 provides that FMIs should hold sufficient LNAFE to implement their recovery or orderly wind-down plan. At a minimum, FMIs should hold LNAFE equal to at least six months of current operating expenses.

However, it appears that some FMIs do not consider the time needed to achieve recovery and orderly wind-down, as shown in Graph 3. For example, some FMIs simply use the “minimum” of six months of current operating expenses to determine the amount of LNAFE they hold, without calculating the amount of assets necessary to implement the recovery or wind-down plan.

¹² Additionally, though it is not in the scope of this assessment, 3 KC 1 of Principle states that an FMI’s “risk-management frameworks should be subject to periodic review”.



Source: CPMI-IOSCO survey of FMI general business risk management, 2023–24.

A few FMIs indicated they use static buffers, holding LNAFE above the minimum amount of six months of current operating expenses, without assessing whether the resulting amounts of LNAFE would be sufficient to implement a recovery or orderly wind-down plan.

4.3.2 Holding LNAFE in addition to resources for risks other than general business risk

Serious issue of concern

A few FMIs do not hold LNAFE in addition to resources held to cover default losses or other risks covered under the financial resources principles.

KC 3 of Principle 15 states that LNAFE should be "in addition to resources held to cover participant defaults or other risks covered under the financial resources principles". EN 3.15.7 sets out more broadly that "assets held by an FMI to cover risks or losses other than business risk (for example, the financial resources required under the credit and liquidity risk principles) or to cover losses from other business lines that are unrelated to its activities as an FMI should not be included when accounting for liquid net assets available to cover business risk".

However, a few participating FMIs indicated that they do not hold LNAFE in addition to resources held to cover losses related to participant default or other risks covered under the financial resources principles. These FMIs did not elaborate further on their rationale for this approach.

4.3.3 Methods for identifying critical operations and services and calculating six months of current operating expenses

Observation

FMIs have a wide range of practices for identifying their critical operations and services, which could lead to different outcomes for recovery or orderly wind-down planning across FMIs and related calculations of the LNAFE required to implement these plans.

KC 2 of Principle 15 states that “the amount of [LNAFE] an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.” Further, as noted in KC 4 of Principle 3 and section 2.4.2 of the Recovery Guidance, an FMI should identify its critical operations and services as part of its recovery planning.

The participating FMIs indicated a wide range of practices for identifying critical operations and services, which could lead to different outcomes for recovery or orderly wind-down planning across FMIs. At least one FMI indicated that it had not yet identified its critical operations and services, while some other FMIs indicated that they rely on regulatory directions or designations to identify critical operations and services. Most participating FMIs described using internal criteria that they developed to support the identification of their critical operations and services. In this context, these FMIs described using different types of internal criteria, which can be broadly grouped as follows.

- Some FMIs determine which services and operations are critical to their clearing, settlement or recording functions. At least one FMI also considers services provided by external vendors that are deemed critical to support the FMI’s core processes.
- Some FMIs conduct business impact analysis, ie assessing the impact of a potential or actual disruption of a certain process on the FMI’s operations and services and its strategic objectives.
- Many FMIs consider the negative impact that the disruption or failure of services could have on markets. Some of these FMIs consider the degree of substitutability of services as well.

Observation

FMIs use a range of methods for determining the minimum amount of six months of current operating expenses, which could lead to different outcomes in calculating LNAFE needs across FMIs.

KC 3 of Principle 15 states that “an FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses.”

Surveyed FMIs’ approaches for calculating the minimum amount of six months of current operating expenses for the LNAFE requirement vary. For example, while many participating FMIs described using historical numbers from their audited financial statements, other FMIs use forecasted or budgeted numbers. A few FMIs indicated using a combination of historical and forecasted or budgeted numbers. Of the FMIs that use historical numbers, some FMIs noted making adjustments to those numbers to calculate the six months of current operating expenses. These different methods for calculating six months of current operating expenses, which is the minimum amount of LNAFE an FMI should hold, could lead to material differences in resilience.

4.4 Recovery and orderly wind-down planning for general business risk

4.4.1 Recovery planning for general business risk

Serious issue of concern

A few FMIs do not have a recovery plan at all, and therefore do not have a recovery plan that addresses general business risk.

KC 3 of Principle 15 states that “an FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan”. Similarly, KC 4 of Principle 3 stipulates that “an FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern” and “should prepare appropriate plans for

its recovery or orderly wind-down based on the results of that assessment". Section 2.4.5 of the Recovery Guidance states that an FMI's recovery scenarios should "take into account the various risks to which the FMI is exposed", including "a wide range of general business losses".

However, a few FMIs did not report having a recovery plan, and therefore do not have a recovery plan that addresses general business risk. The lack of recovery planning for addressing general business risk constitutes a fundamental gap in FMIs' practices with regard to KC 3 of Principle 15 and KC 4 of Principle 3.

Observation

The depth of analysis confirming the adequacy of recovery scenarios and tools for general business risk varies across FMIs, which may lead to material differences in the viability of FMIs' recovery plans.

Analysis of recovery scenarios for general business risk

Most of the participating FMIs with a recovery plan confirmed that they have included a range of general business risk-related scenarios in their recovery plans in line with section 2.4.5 of the Recovery Guidance. However, the breadth and depth of analysis of potential general business risk recovery scenarios vary significantly across FMIs.

While all participating FMIs with specific general business risk-related recovery scenarios responded that they consider recovery scenarios related to operational risk, other types of risk that may result in business-related losses – such as adverse business developments, legal risks, and custody and investment risks – are not considered uniformly across these FMIs. FMIs' reasons for not considering certain types of risks varied, including the lack of exposure to certain risks (specifically with regard to custody and investment risks), challenges in quantification, existing risk mitigants or lack of plausible recovery scenarios.

Many FMIs indicated that they consider both idiosyncratic and system-wide stress events, and some FMIs reflected on potential contagion risks arising from interconnections and interdependencies with affiliated entities and/or internal or external service providers in their recovery scenarios.

A few participating FMIs distinguished between gradually developing and sudden events. Some FMIs considered whether recovery scenarios give rise to liquidity difficulties and/or capital shortfalls. These considerations could be helpful in understanding the risk implications for the FMI (and identifying the most effective recovery tools on this basis).

Some participating FMIs did not consider simultaneous loss scenarios. For CCPs that do consider simultaneous scenarios, these generally relate to the combination of default and non-default losses, such as the inability to access deposits or investments due to the default or unavailability of a financial counterparty. For other types of FMI, simultaneous scenarios considered include the combination of an idiosyncratic scenario with a market-wide scenario.

With regards to FMIs' processes for identifying general business risk recovery scenarios, some FMIs indicated that they use their general risk inventory and seek to identify on that basis scenarios in which they would incur losses that could impair their continued operation. A few FMIs noted that they have additional internal processes for identifying potential new risks regularly and proactively, including in at least one case, the use of external expert input.

FMIs use different reference points for identifying recovery scenarios: while a few FMIs noted measuring potential losses stemming from their identified risks "under stressed conditions", some other FMIs referred to "exceptional but realistic" or "extreme but plausible events" and a few others estimate losses from the "most probable events".

Analysis of recovery tools for general business risk

Section 3.3 of the Recovery Guidance elaborates on appropriate characteristics of recovery tools, noting that recovery tools should be: (i) comprehensive; (ii) effective; (iii) transparent, measurable, manageable and controllable; (iv) create appropriate incentives; and (v) minimise negative impact. Section 3.3.2 states that an FMI should endeavour to develop a set of tools, including the sequence in which they would be used, that exhibits these characteristics to the greatest extent possible.

Section 4.6 of the Recovery Guidance discusses potential tools to address losses not caused by participant default, including (i) the use of equity capital; (ii) recapitalisation; (iii) insurance or indemnity arrangements; and (iv) arrangements for allocating custody and investment losses on participants' assets to their owners (including potentially through a dedicated cash call). As regards recapitalisation, sections 4.6.5–4.6.7 mention as potential tools ex ante arrangements with existing owners or debtholders and ex-ante contingency plans for structuring optional contributions (for example, from the FMI's participants).

While most of the participating FMIs have identified recovery tools for general business risk, these FMIs generally conducted no or very limited analysis to support their conclusion that these tools would be comprehensive and effective for the general business risk-related recovery scenarios considered.

For example, participating FMIs did not demonstrate that they have assessed whether their recovery tools (eg uncommitted arrangements for raising equity or debt, drawing on lines of credit, insurance payments, voluntary cash calls, envisaged sale or restructuring of the FMI's assets) would be reliable or practicable within the time frame needed or whether they would be sufficient to meet the prospective resource needs of the FMI (eg reducing expenses, eliminating dividends, increasing fees, delaying the FMI's payments).

An essential general business risk recovery tool foreseen by FMIs is the raising of additional capital through existing or potential new shareholders or parent companies. However, most participating FMIs indicated they do not have ex ante arrangements for this purpose. A few FMIs described holding a capital buffer that would be reserved for recovery.

Observation

The use and definition of recovery triggers for scenarios related to general business risk vary significantly across FMIs, which may lead to material differences in FMIs' processes for information-sharing and escalation before implementing recovery plans.

Section 2.4.6 of the Recovery Guidance states that an FMI should develop both quantitative and qualitative triggers for recovery to help avoid undue delays in implementing the recovery plans. Section 2.4.8 states that these triggers should lead to a predetermined information-sharing and escalation process within the FMI's senior management and its board of directors and to careful consideration of what action should be taken.

There are material differences across participating FMIs regarding the use and definition of recovery triggers for general business risk. Many FMIs set out quantitative triggers in their recovery plan, while some FMIs also mentioned maintaining qualitative indicators. Quantitative indicators relate to different metrics such as the FMI's financial soundness, liquidity, asset quality, profitability, operational viability or other market-based factors. A few FMIs consider LNAFE falling below six months of operating expenses or the level required by local regulation to be a quantitative trigger for recovery.

Some of the FMIs with quantitative triggers also described using early warning indicators to trigger the governance process related to the decision to activate the recovery plan in order to further support predetermined information-sharing and escalation processes in view of risks potentially requiring the FMI's recovery. For instance, at least one FMI implemented a traffic light system in which an orange light indicates that the early warning limit has been reached, and a red light that recovery is triggered. At

least one FMI uses a dashboard to monitor the deterioration of core risk indicators that could signal the potential for adverse financial implications in the near or medium term.

4.4.2 Orderly wind-down planning for general business risk

Serious issue of concern

Some FMIs do not have an orderly wind-down plan that addresses general business risk.

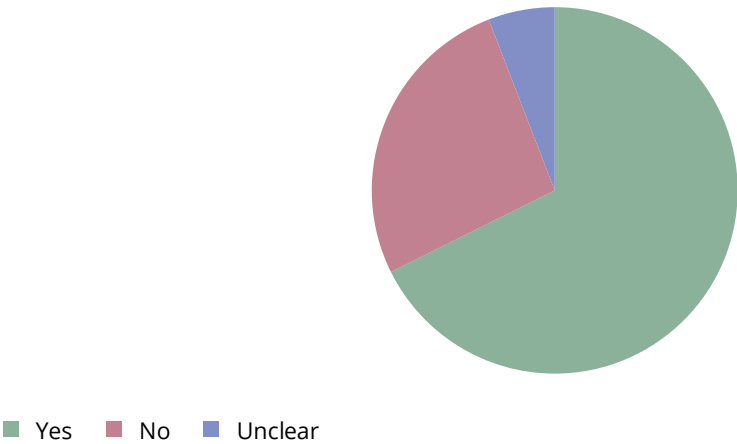
KC 3 of Principle 15 states that FMIs “should maintain a viable recovery or orderly wind-down plan” and KC 4 of Principle 3 provides that FMIs should “assess the effectiveness of a full range of options for recovery or orderly wind-down” considering that recovery may fail. Section 2.2.2 of the Recovery Guidance underlines that a recovery plan is not a substitute for an orderly wind-down plan and that both plans are needed: “where ... a [recovery] plan proves, in a particular circumstance, to be ineffective, it is important that the FMI have a plan to wind down in an orderly manner”.

However, some participating FMIs did not indicate that they had a plan for orderly wind-down at all (see Graph 4), and a few FMIs did not specify whether they had an orderly wind-down plan that addresses losses stemming from general business risk.

FMIs provided a number of reasons why they do not have an orderly wind-down plan that addresses general business risk. A few FMIs consider that wind-down would be difficult or impossible due to the FMI’s monopoly position, lack of alternative providers, or legal obstacles. A few FMIs are of the view that wind-down is covered by resolution or would be unnecessary due to the existence of recovery planning.

Does the FMI have an orderly wind-down plan covering general business losses?

Graph 4



Source: CPMI-IOSCO survey of FMI general business risk management, 2023–24.

Observation

FMIs’ approaches to orderly wind-down planning for general business risk differ materially, including the types of wind-down scenarios used, the testing and review of orderly wind-down plans with stakeholders and the provision of transparency on orderly wind-down planning to FMIs’ members.

FMIs’ responses on approaches to orderly wind-down planning varied significantly. For example, in terms of identifying wind-down scenarios, some FMIs consider scenarios related to regulatory considerations (eg a scenario in which the FMI would be unable to meet regulatory capital requirements), while some

FMI focus on wind-down as the result of a strategic business decision. A few FMIs noted they would consider using their wind-down plan if the recovery plan were to fail.

Regarding methods of testing and reviewing orderly wind-down plans, a few FMIs indicated that they conduct an annual review of the wind-down plan, and a few FMIs conduct annual testing of critical systems that would be relevant in a wind-down situation, for instance by performing an orderly wind-down simulation or by doing an assessment of the systems and staff deemed critical to ensuring continued service availability.

To ensure transparency of wind-down planning to FMI members, some FMIs stated they provide members with high-level descriptions of their wind-down tools or publicly disclose relevant information, such as trigger events for wind-down and service closures. A few FMIs mentioned reviewing their orderly wind-down plans with stakeholders. A few FMIs responded that they do not provide information on their wind-down tools to their members.

The level of granularity in operational planning for orderly wind-down also differs across FMIs; for example, some FMIs have established arrangements with similar FMIs to transfer member or client assets.

4.5 Quality and liquidity of assets held as LNAFE

Observation

FMIs hold materially different assets as LNAFE. They also differ significantly in their interpretations of how liquid an asset needs to be in order to be eligible as LNAFE.

EN 3.15.8 states that “assets held to cover general business risk should be of high quality and sufficiently liquid, such as cash, cash equivalents, or liquid securities, to allow the FMI to meet its current and projected operating expenses under a range of scenarios including in adverse market conditions”. There are material differences in the types of assets that participating FMIs hold as LNAFE.

Many FMIs indicated that they hold cash. Only a few FMIs stated that they hold LNAFE predominantly in cash, and some FMIs do not hold any cash. A few FMIs that hold cash highlighted that they use at least part of that cash to enter into overnight reverse repurchase agreements, holding securities overnight. In terms of other types of assets held as LNAFE, FMIs indicated that they hold sovereign debt, public debt, corporate debt, and other instruments and/or money market funds among other assets.

Participating FMIs also differed widely in their interpretations of how liquid an asset needs to be to meet the LNAFE requirements. Some FMIs mentioned holding government or quasi-government securities. Other types of securities held include commercial paper and corporate bonds (which must meet minimum credit ratings and criteria), mutual funds composed of municipal bonds and fixed income securities, and money market funds. FMIs’ approaches also differ in terms of the maturity of the securities that they hold as LNAFE.

Observation

Few of the participating FMIs appear to have processes for regularly assessing whether their assets held as LNAFE are of high quality and sufficiently liquid.

EN 3.15.8 states: “To ensure the adequacy of its own resources, an FMI should regularly assess and report its liquid net assets funded by equity relative to its potential business risks to its regulators.”

Only a few FMIs indicated that they regularly assess whether LNAFE is of high quality and sufficiently liquid. Examples described by FMIs include:

- a process whereby the quality and liquidity of LNAFE is monitored daily for adherence to the high quality and liquidity factors set out in the FMI's investment policy, with a buffer to protect against adverse market conditions and additional capital requirements to include extreme but plausible changes to operating expenses;
- management of LNAFE under a same day liquidity requirement and capital preservation objective, with performance of the portfolio reported to senior management and the board of directors each month; and
- periodic or monthly analysis to ensure that assets are high quality and sufficiently liquid.

4.6 Plan for raising additional equity

Serious issue of concern

Some FMIs do not maintain an explicit plan for raising additional equity in case of capital shortfalls.

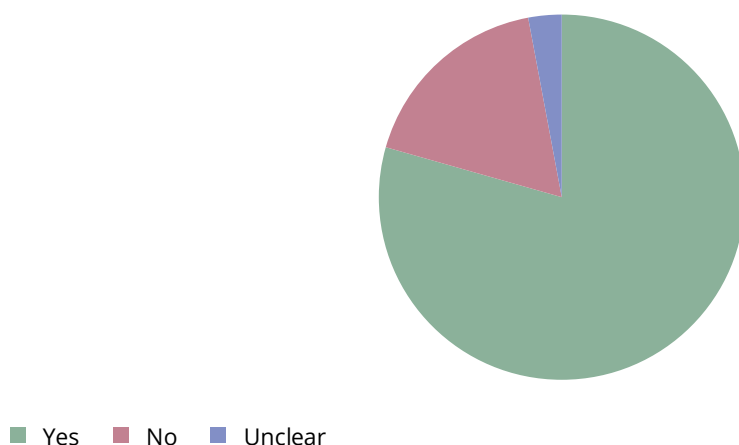
KC 5 of Principle 15 states that an FMI "should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed" and that this plan should be "approved by the board of directors and updated regularly". KC 5 does not prescribe the substance of the plan but sets out a clear expectation that FMIs maintain such a plan.

ENs 3.15.9 and 3.15.10 provide further information on the components of the plan, including some of the factors that FMIs should consider in developing the plan. Section 4.6.4 of the Recovery Guidance further notes that, following the occurrence of losses, an FMI "must ensure that its financial viability is restored within a reasonable time".

While most participating FMIs stated that they maintain an explicit plan for raising additional equity that is approved by their board of directors and regularly reviewed, some FMIs do not maintain an explicit plan for raising additional equity and would therefore rely on ad-hoc approaches, such as seeking optional contributions from their parent company (see Graph 5).

Does the FMI have an explicit plan for raising equity?

Graph 5



Source: CPMI-IOSCO survey of FMI general business risk management, 2023–24.

The absence of an explicit plan for raising additional equity raises concerns regarding some FMIs' preparedness for replenishing financial resources in the aftermath of a general business loss scenario, particularly where an FMI may need to raise additional equity quickly to restore its financial viability.

Observation

Planning for raising additional equity differs significantly across FMIs, for example in the processes and analysis used to determine the plan's viability, and in the number and types of tools included.

KC 5 of Principle 15 provides that an FMI "should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed". EN 3.15.9 clarifies that "the capital plan should specify how an FMI would raise new capital". Section 4.6 of the Recovery Guidance outlines possible means (or tools) for a recapitalisation. Section 4.6.5 of the Recovery Guidance states that one appropriate means for raising equity capital could be for an FMI to develop ex ante arrangements with existing owners regarding the recapitalisation of the FMI so that it can continue providing critical services. Section 4.6.8 cautions against reliance on a single tool for raising additional equity.

There are significant differences across participating FMIs in their responses regarding the processes and analysis used to determine the viability of their equity-raising plans and the number and types of tools included. Only a few of the FMIs that maintain a plan for raising additional equity identified specific processes or analysis used to support the conclusion that their plan is viable. For example, some FMIs mentioned using annual testing and scenario analysis. Other FMIs refer to their previous experience in raising equity to support the viability of their plan.

Some FMIs indicated that they would be wholly reliant on their parent organisation or existing shareholders for recapitalisation. The majority of these FMIs did not describe having established ex ante arrangements with existing owners to recapitalise. By contrast, the remaining FMIs mentioned maintaining a parental support agreement, committed ring-fenced capital, or governance processes for the allocation of parental support.

The majority of FMIs with equity plans stated they would primarily be reliant on voluntary contributions from new or existing shareholders. Some of these FMIs consider that they could expect support due to their importance to their parent or the wider market. By contrast, some other FMIs noted they have established a committed funding arrangement, such as a letter of comfort from the parent company. A few FMIs indicated that they have insurance agreements in place.

Annex A – Relevant extracts from the PFMI and Recovery Guidance

PFMI Principle 15 (General business risk)

An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.

Key Consideration 1

An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.

Key Consideration 2

An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.

Key Consideration 3

An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.

Key Consideration 4

Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.

Key Consideration 5

An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.

EN 3.15.1

An FMI should have robust management and control systems to identify, monitor, and manage general business risk. General business risk refers to the risks and potential losses arising from an FMI's administration and operation as a business enterprise that are neither related to participant default nor separately covered by financial resources under the credit or liquidity risk principles. General business risk includes any potential impairment of the FMI's financial position (as a business concern) as a consequence of a decline in its revenues or an increase in its expenses, such that expenses exceed revenues and result in a loss that must be charged against capital. Such impairment can be caused by a variety of business factors, including poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses. Business-related losses also may arise from risks covered by other principles, for example, legal risk (in the case of legal actions challenging the FMI's custody arrangements), investment risk affecting the FMI's resources, and operational risk (in the case of fraud, theft, or loss). In these cases, general business risk may cause an FMI to experience an extraordinary one-time loss as opposed to recurring losses.

EN 3.15.2

An FMI should identify and assess the sources of business risk and their potential impact on its operations and services, taking into account past loss events and financial projections. An FMI should assess and thoroughly understand its business risk and the potential effect that this risk could have on its cash flows,

liquidity, and capital positions. In doing so, an FMI should consider a combination of tools, such as risk management and internal control assessments, scenario analysis, and sensitivity analysis. Internal control assessments should identify key risks and controls and assess the impact and probability of the risks and the effectiveness of the controls. Scenario analysis should examine how specific scenarios would affect the FMI. Sensitivity analysis should test how changes in one risk affect the FMI's financial standing, for example, conducting the analysis of how the loss of a key customer or service provider might impact the FMI's existing business activities. In some cases, an FMI may want to consider an independent assessment of specific business risks.

EN 3.15.3

An FMI should clearly understand its general business risk profile so that it is able to assess its ability either (a) to avoid, reduce, or transfer specific business risks or (b) to accept and manage those risks. This requires the ongoing identification of risk-mitigation options that the FMI may use in response to changes in its business environment. When planning an expansion of activity, an FMI should conduct a comprehensive enterprise risk assessment. In particular, when considering any major new product, service, or project, the FMI should project potential revenues and expenses as well as identify and plan how it will cover any additional capital requirements. Further, an FMI may eliminate or mitigate some risks by instituting appropriate internal controls or by obtaining insurance or indemnity from a third party.

EN 3.15.4

Once an FMI has identified and assessed its business risk, it should measure and monitor these risks on an ongoing basis and develop appropriate information systems as part of a robust enterprise risk-management program. Key components of a robust enterprise risk-management program include establishing strong financial and internal control systems so that the FMI can monitor, manage, and control its cash flows and operating expenses and mitigate any business-related losses (see Principle 3 on framework for the comprehensive management of risks). In particular, an FMI should minimise and mitigate the probability of business-related losses and their impact on its operations across a range of adverse business and market conditions, including the scenario that its viability as a going concern is questioned. An FMI should also ensure that it has rigorous and appropriate investment guidelines and monitoring procedures (see Principle 16 on custody and investment risks).

EN 3.15.7

Assets held by an FMI to cover risks or losses other than business risk (for example, the financial resources required under the credit and liquidity risk principles) or to cover losses from other business lines that are unrelated to its activities as an FMI should not be included when accounting for liquid net assets available to cover business risk. However, equity held under international risk-based capital standards should be included where relevant and appropriate to avoid duplicate capital requirements.

EN 3.15.8

Assets held to cover general business risk should be of high quality and sufficiently liquid, such as cash, cash equivalents, or liquid securities, to allow the FMI to meet its current and projected operating expenses under a range of scenarios including in adverse market conditions. To ensure the adequacy of its own resources, an FMI should regularly assess and report its liquid net assets funded by equity relative to its potential business risks to its regulators.

EN 3.15.9

An FMI should provide a viable capital plan for maintaining an appropriate level of equity. The capital plan should specify how an FMI would raise new capital if its equity capital were to fall close to or below the amount needed. This plan should be approved by the board of directors (or an appropriate board committee) and updated regularly. An FMI may also need to consult its participants and others during the development of its plan.

Principle 3 (Framework for the comprehensive management of risks)

An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.

Key consideration 4

An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.

Recovery Guidance

Section 2.2

2.2.2 Given the systemic importance of FMIs, it is necessary that each FMI have a comprehensive and effective recovery plan designed to permit the FMI to continue to provide its critical services. However, where such a plan proves, in a particular circumstance, to be ineffective, it is important that the FMI have a plan to wind down in an orderly manner. A plan for an orderly wind-down is not a substitute for having a comprehensive and effective recovery plan.

Section 2.4

2.4.2 An FMI should identify those services it provides that are critical. "Critical" refers to the importance of the service to the FMI's participants and other FMIs, and to the smooth functioning of the markets the FMI serves and, in particular, the maintenance of financial stability. The purpose of identifying critical services is to focus the recovery plan on the FMI's ability to continue to provide these services on an ongoing basis, even when it comes under extreme stress. The identification of critical services should be done in close coordination with the relevant authorities and in consultation with relevant stakeholders.

2.4.5 As required by Principle 3 of the PFMI, an FMI should identify scenarios that may prevent it from being able to provide its critical services as a going concern. These scenarios should take into account the various risks to which the FMI is exposed, which will vary across different types of FMIs and even across FMIs of the same type. These scenarios may include, but are not limited to, credit losses or liquidity shortfalls created by a participant default, a wide range of general business losses or liquidity shortfalls, or the realisation of investment losses or liquidity shortfalls (for example, from financial assets the FMI holds at third parties). They should also include the risk associated with the failure of a third party to perform a critical function for the FMI (for example, the failure of a settlement bank, liquidity provider or other service provider). Where the FMI is part of a group, it may be at risk from circumstances affecting other entities in the group. Where the FMI has links with other FMIs, it may be at risk from failures at those FMIs. The underlying assumptions should be such that the scenarios are sufficiently severe. Both idiosyncratic and system-wide stress scenarios should be considered, taking into account the potential impact of domestic and cross-border contagion in crises, as well as simultaneous crises in several significant markets.

2.4.6 An FMI should define the criteria (both quantitative and qualitative) that will trigger the implementation of part or all of the recovery plan. This will help avoid undue delays in the implementation of the plan.

[...]

2.4.9 An FMI should identify appropriate recovery tools, indicate the necessary steps and time needed to implement them, and assess the associated risks to the FMI, its participants, linked FMIs and the market more generally. The recovery plan should include tools to cover shortfalls from the stress scenarios identified by the FMI – whether or not caused by participant default – that are not covered by pre-funded financial resources or where the FMI does not have sufficient liquidity arrangements to meet its obligations on time. Also included should be tools to deal with other losses or liquidity shortfalls, in particular from those general business risks that may materialise more slowly. The FMI may also need tools to increase its capital. Possible recovery tools are discussed in Sections 3 and 4.

Section 3.3

3.3.1 The appropriateness of a given recovery tool or set of tools will vary based on particular FMIs and their individual circumstances. In some cases, a single recovery tool may be sufficient to achieve recovery of the FMI; however, in many cases, an FMI will probably need to use a combination of tools to achieve

such an outcome. The following characteristics will help an FMI evaluate the strengths and weaknesses of tools so that it can choose the set most appropriate for each relevant recovery scenario, including the sequence in which they should be used.

- i. *Comprehensive*. The set of tools should comprehensively address how the FMI would continue to provide critical services in all relevant scenarios.
- ii. *Effective*. Each tool should be reliable, timely, and have a strong legal basis.
- iii. *Transparent, measurable, manageable and controllable*. Tools should be transparent and designed to allow those who would bear losses and liquidity shortfalls to measure, manage and control their potential losses and liquidity shortfalls.
- iv. *Create appropriate incentives*. The tools should create appropriate incentives for the FMI's owners, direct and indirect participants, and other relevant stakeholders.
- v. *Minimise negative impact*. The tools should be designed to minimise the negative impact on direct and indirect participants and the financial system more broadly.

3.3.2 An FMI should endeavour to develop a set of tools, including the sequence in which they would be used, that exhibits these characteristics to the greatest extent possible. However, because no set of tools may fully satisfy all the characteristics, an FMI will need to determine which set achieves the best trade-off.

Section 4.6

4.6.4 Although an FMI should have sufficient liquid net assets funded by equity to implement its recovery or orderly wind-down plan for general business losses, in those FMIs that are organised as limited liability entities shareholders cannot lose more than the total of their investment. Hence the amount of resources which can be obtained from them may be less than the loss faced by the FMI. Even where the amount of liquid net assets funded by equity is sufficient, the FMI will need to replenish such resources after they have been used. Consistent with principle 15, an FMI should therefore have a viable plan to increase its equity capital should its equity capital fall close to or below the amount needed to implement its plan, for example, by recapitalisation after extraordinary losses, equity capital conservation measures such as suspension of dividends and payments of variable remuneration, or voluntary restructuring of liabilities through debt-to-equity conversion. In considering how, and from whom, such resources can be acquired, the tools available to the FMI may be affected by limits to the liability of shareholders and, where they are involved in the loss-sharing, participants in an FMI. Following the occurrence of losses, an FMI must ensure that its financial viability is restored within a reasonable time.

4.6.5 The appropriate means for raising equity capital will necessarily be affected by the existing ownership structure of the FMI. Some FMIs may be user-owned, others may be owned by private investors, and others may be owned by public shareholders. Where the ownership structure supports it, one appropriate means for raising equity capital could be for an FMI to develop ex ante arrangements with existing owners regarding the recapitalisation of the FMI so that it can continue providing critical services. The arrangements could specify how any recapitalisation would proceed, including commitments to contribute (if any), and terms associated with any new equity capital issued. Other elements that may need to be considered are the available loss absorption capacity and the additional resources potentially needed to address the selected recovery scenarios.

4.6.6 Another appropriate means for raising equity capital could be for an FMI to develop, ex ante, contingency plans to structure optional contributions for recapitalisation, for example from participants in the FMI. In such circumstances, such optional contributors could be compensated with an ownership interest in the FMI commensurate with the level of "new value" contributed. Depending on how it is implemented, this would imply the dilution or subordination of the interests of existing owners who do not contribute. This could incentivise participation in an equity capital-raising exercise by permitting

contributing institutions to benefit from any upside potential from the revitalised FMI. Contributors of new value may also obtain voting power.

4.6.7 Where an FMI has debt in its capital structure, a further appropriate means for raising equity capital could be for an FMI to develop ex ante arrangements with the existing debt holders regarding the bail-in of their instruments.

4.6.8 While it may not be appropriate for an FMI to rely fully on any one means of raising equity capital, having the mechanisms to facilitate a recapitalisation may expedite equity capital-raising in a recovery scenario.

Annex B – Members of the IMSG and Assessment Team

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