IFSB-26

CORE PRINCIPLES FOR ISLAMIC FINANCE REGULATION (FINANCIAL MARKET INFRASTRUCTURES)

9 DECEMBER 2021

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The IFSB is an international standard-setting organisation which was officially inaugurated on 3 November 2002 and started operations on 10 March 2003. The organisation promotes and enhances the soundness and stability of the Islamic financial services industry by issuing global prudential standards and guiding principles for the industry, broadly defined to include the banking, capital markets and insurance sectors. The standards prepared by the IFSB follow a stringent due process as outlined in its Guidelines and Procedures for the Preparation of Standards/Guidelines, which includes holding several Working Group meetings, issuing exposure drafts and organising public hearings/webinars and reviews by the IFBS's Sharī'ah Board and Technical Committee. The IFSB also conducts research and coordinates initiatives on industry-related issues and organises roundtables, seminars and conferences for regulators and industry stakeholders. Towards this end, the IFSB works closely with relevant international, regional and national organisations, research/educational institutions and market players.

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ABBREVIATIONS

BCBS	Basel Committee on Banking Supervision
CB	Central Bank
CCP	Central Counterparty
COVID-19	Coronavirus disease 2019
CPIFRFMI Standard	Core Principles for Islamic Finance Regulation (Financial Market Infrastructures)
CPIFRFMI WG	Core Principles for Islamic Finance Regulation (Financial Market Infrastructures) Working Group
CPSS	Committee on Payment and Settlement Systems (now the Committee on Payments and Market Infrastructures, CPMI)
CPSS-IOSCO Documents	CPSS-IOSCO PFMI (April 2012) and its associated Disclosure Framework and Assessment Methodology (December 2012)
CSD	Central Securities Depository
DNS	Deferred Net Settlement
DvP	Delivery versus Payment
FMI	Financial Market Infrastructure
FSAP	Financial Sector Assessment Program
IAIS	International Association of Insurance Supervisors
ICM	Islamic Capital Market
IFIS	Islamic Financial Services Industry
IFSB	Islamic Financial Services Board
IIFS	Institutions offering Islamic Financial Services
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
PFMI	CPSS-IOSCO Principles for Financial Market Infrastructures
PS	Payment System
RSA	Regulatory and Supervisory Authority
RTGS	Real Time Gross Settlement

SSS	Securities Settlement System
TC	Technical Committee of the IFSB
TR	Trade Repository
WP	Working Paper

Bism Allah al-raḥmān al-raḥīm

Allahumma ṣalli wa sallim ʻalā Sayyidina Muḥammad waʿalā ʾālihī wa ṣaḥbih

SECTION 1: INTRODUCTION

1.1 Background

1. Core principles for regulation of the financial sector have become standard tools to guide regulatory and supervisory authorities (RSAs) in developing their regulatory regimes and practices. They also serve as the basis for regulatory authorities or external parties such as multilateral agencies to assess the strength and effectiveness of regulation and supervision in a jurisdiction. Core principles have been adopted for each of the banking, capital markets and insurance sectors by, respectively, the Basel Committee on Banking Supervision (BCBS), the International Organization of Securities Commissions (IOSCO) and the International Association of Insurance Supervisors (IAIS).

2. Acknowledging the need for core principles in the area of Islamic finance, the IFSB Secretariat undertook a review of the applicability of the BCBS, IOSCO and IAIS core principles across the three sectors of Islamic finance (banking, capital markets and *takāful*, respectively), the substance of the analysis being published in November 2014 as Working Paper WP-02: *Working Paper on Evaluation of Core Principles Relevant to Islamic Finance Regulation.* The analysis was performed at the level of the standards within each set of core principles, indicating how far they may be applied to the supervision of Islamic financial services, as well as the type of changes or additions that may be required to those core principles for this purpose, taking into consideration the specificities of Islamic financial services. Somewhat briefer analyses were undertaken of three other sets of core principles (or equivalents), including the *CPSS[1]-IOSCO Principles for Financial Market Infrastructures* (PFMI). WP-02 discussed the applicability of the 24 principles which relate to financial market

[1] The Committee on Payment and Settlement Systems (CPSS) changed its name to the Committee on Payments and Market Infrastructures (CPMI) on 1 September 2014. Though some other publications have referred to the same document as "*CPMI–IOSCO Principles for Financial Market Infrastructures*", for the purposes of this standard the original name has been retained to avoid confusion.

infrastructures (FMIs) themselves, but did not discuss the five responsibilities of authorities for FMIs which are embedded in the PFMI.

3. In general, WP-02 indicated that all of the 24 principles in the PFMI are applicable to Islamic finance. However, in order to establish a more effective regulatory system, certain specific characteristics of Islamic finance need to be considered by regulators or reflected in the regulatory system; these may include, but not be limited to, Sharīʿah governance and specific risk characteristics as recommended by the report. The report also noted that so little work had been done on the topic of FMIs for Islamic finance that it was difficult for the report to draw firm conclusions.

4. Following the publication of WP-02, the IFSB has developed sets of IFSB Core Principles for Islamic Finance Regulation (CPIFR), namely; IFSB 17: *Core Principles for the Islamic Finance Regulation (Banking Segment)* (April 2015), IFSB 21: *Core Principles for Islamic Finance Regulation (Islamic Capital Market Segment)* (December 2018), and IFSB-IADI *Core Principles for Effective Islamic Insurance Deposit Systems* (December 2020). Currently, the IFSB is working on another CPIFR project called *Core Principles for Islamic Finance Regulation [Takāful Segment]*.

5. IFSB 21, which complemented IOSCO's *"Objectives and Principles of Securities Regulation"* and its Methodology (May 2017), did not cover Principle 38, on Clearing and Settlement, which relates to FMIs, partly because of the limited amount of work done in this area but mainly because this principle has no assessment methodology of its own but instead cross-refers to the PFMI.

6. This standard intends to complement the PFMI in order to cover the entire spectrum of core principles concerning the Islamic capital market (ICM). It was drafted by a Core Principles for Islamic Finance Regulation (Financial Market Infrastructures) Working Group ("the WG") under the direction and guidance of the IFSB Technical Committee (TC). The standard was built on the CPSS-IOSCO PFMI (April 2012) and its associated Disclosure Framework and Assessment Methodology (December 2012) (collectively referred to as "the CPSS-IOSCO Documents"), to address areas in which the existing CPSS-IOSCO Documents either do not deal, or deal inadequately, with the specificities of Islamic finance. It has also taken into account some lessons learned from the COVID-19 pandemic, particularly in areas relating to the operational resilience of FMIs.

1.2 Objectives

7. The standard intends to provide a complete set of core principles for FMIs and their regulation and supervision taking into consideration the specificities relating to Islamic finance. Ultimately, the standard intends to achieve the following objectives:

i. to develop a comprehensive standard for effective regulation, supervision, and oversight of FMIs addressing the specificities relating to Islamic finance;

ii. to equip RSAs with minimum international benchmarks to ensure safe, transparent, and robust FMIs for the purpose of preserving financial stability and operational efficiency in Islamic finance jurisdictions; and

iii. to assist the RSAs in assessing the quality of their regulatory framework for their respective FMIs and identifying areas for improvement as an input to their reform agenda.

8. The IFSB envisages that the CPIFRFMI will be used by jurisdictions as a benchmark for assessing the quality of their regulatory and supervisory systems, and for identifying future work to achieve a baseline level of sound regulations and practices for Islamic FMIs. RSAs should consider proportionality in applying this standard by taking account of the size, nature, and complexity of the FMIs and the characteristics of the ICM environment in which they operate. The development of CPIFRFMI is intended to promote further integration of Islamic finance with the international architecture for financial stability and operational efficiency, especially in the area of securities clearing and settling, payment, and data recording in the FMIs. Furthermore, the CPIFRFMI may also assist IFSB member jurisdictions in: (a) the International Monetary Fund (IMF) and the World Bank financial sector assessment programme (FSAP); (b) self-assessment; (c) reviews conducted by private third parties; and (d) peer reviews conducted, for instance, within regional groupings of capital market RSAs.

1.3 Definition of FMIs

9. For the purposes of this standard, and following the approach taken by the PFMI, an FMI is defined as a multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling, or recording payments, securities,

or other financial transactions.[2] FMIs typically establish a set of common rules and procedures for all participants, a technical infrastructure, and a specialised risk management framework appropriate to the risks they incur. FMIs provide participants with centralised clearing, settlement, and recording of financial transactions among themselves or between each of them and a central party to allow for greater efficiency and reduced costs and risks. Through the centralisation of specific activities, FMIs also allow participants to manage their risks more efficiently and effectively, and, in some instances, eliminate certain risks. FMIs can also promote increased transparency in particular markets. Some FMIs are critical to helping central banks conduct monetary policy and maintain financial stability.[3]

10. FMIs can differ significantly in organisation, function, and design. FMIs can be legally organised in a variety of forms, including associations of financial institutions, non-bank clearing corporations, and specialised banking organisations. FMIs may be owned and operated by a central bank or by the private sector. FMIs may also operate as for-profit or not-for-profit entities. Depending on organisational form, FMIs can be subject to different licensing and regulatory schemes within and across jurisdictions. For example, bank and non-bank FMIs are often regulated differently. For the purposes of this standard, the definition of an FMI includes five key types of FMIs: payment systems, central securities depositories (CSDs), securities settlement systems (SSSs), central counterparties (CCPs), and trade repositories (TRs). There can be significant variation in design among FMIs with the same function. For example, some FMIs use real-time settlement, while others may use deferred settlement.

[2] The general analytical approach of this standard is to consider FMIs as multilateral systems, inclusive of their participants, as stated in the definition of FMI. In market parlance, however, the term "FMI" may be used to refer only to a legal or functional entity that is set up to carry out centralised, multilateral payment, clearing, settlement, or recording activities and, in some contexts, may exclude the participants that use the system. This difference in terminology or usage may introduce ambiguity at certain points in the standard. To address this issue, the standard may refer to an FMI and its participants, or to an FMI *including* its participants, to emphasise the coverage of a principle or other text where this is not clear from the context. The definition of FMIs excludes bilateral relationships between financial institutions and their customers, such as traditional correspondent banking.

[3] Typically, the effective implementation of monetary policy depends on the orderly settlement of transactions and the efficient distribution of liquidity. For example, many central banks implement monetary policy by influencing short-term profit rates through the purchase and sale of certain financial instruments, such as government securities or foreign exchange, or through collateralised lending. It is important that FMIs be safe and efficient and allow for the reliable transfer of funds and securities between the central bank, its counterparties, and the other participants in the financial system so that the effect of monetary policy transactions can be spread widely and quickly throughout the economy.

Some FMIs settle individual transactions while others settle batches of transactions. Annex F provides greater detail on different designs for payment systems, SSSs, and CCPs.

Payment systems

11. A payment system is a set of instruments, procedures, and rules for the transfer of funds between or among participants; the system includes the participants and the entity operating the arrangement. Payment systems are typically based on an agreement between or among participants and the operator of the arrangement, and the transfer of funds is affected using an agreed-upon operational infrastructure. A payment system is generally categorised as either a retail payment system or a large-value payment system (LVPS). A retail payment system is a funds transfer system that typically handles a large volume of relatively low-value payments in such forms as cheques, credit transfers, direct debits, and card payment transactions. Retail payment systems may be operated either by the private sector or the public sector, using a multilateral deferred net settlement (DNS) or a real-time gross settlement (RTGS) mechanism. An LVPS is a funds transfer system that typically handles large-value and high-priority payments. In contrast to retail systems, many LVPSs are operated by central banks, using an RTGS or equivalent mechanism. This standard applies only to those payment systems that are considered systemically important; depending on the jurisdiction, this is likely to include all LVPSs but not necessarily all retail payment systems.

Central securities depositories

12. A central securities depository (CSD) provides securities accounts, central safekeeping services, and asset services, which may include the administration of corporate actions and redemptions, and plays an important role in helping to ensure the integrity of securities issues (i.e. ensure that securities are not accidentally or fraudulently created or destroyed or their details changed). A CSD can hold securities either in physical form (but immobilised) or in dematerialised form (i.e. they exist only as electronic records). The precise activities of a CSD vary based on jurisdiction and market practices. For example, the activities of a CSD may vary depending on whether it operates in a jurisdiction with a direct or indirect holding arrangement or a combination of both.[4] A CSD may maintain the definitive record of

[4] In a direct holding system, each beneficial or direct owner of the security is known to the CSD or the issuer. In some countries, the use of direct holding systems is required by law. Alternatively, an indirect holding system

legal ownership for a security; in some cases, however, a separate securities registrar will serve this notary function.[5] In many countries, a CSD also operates a securities settlement system (as defined in paragraph 13), but unless otherwise specified, this standard adopts a narrower definition of CSD that does not include securities settlement functions.

Securities settlement systems

13. A securities settlement system (SSS) enables securities to be transferred and settled by book entry according to a set of predetermined multilateral rules. Such systems allow transfers of securities either free of payment or against payment. When transfer is against payment, many systems provide delivery versus payment (DvP), where delivery of the security occurs if and only if payment occurs. An SSS may be organised to provide additional securities clearing and settlement functions, such as the confirmation of trade and settlement instructions.

Central counterparties

14. A central counterparty (CCP) interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the performance of open contracts. A CCP becomes counterparty to trades with market participants through novation, an open-offer system, or through an analogous legally binding arrangement.[6] CCPs have the potential to reduce significantly risks to participants through the multilateral netting of trades and by imposing more-effective risk controls on all participants. For example, CCPs typically require participants to provide collateral (in the form of initial collateral and other financial resources) to cover current and potential future exposures. CCPs may also mutualise certain risks through devices such as default funds. As a result of their potential to reduce risks to participants, CCPs also can reduce systemic risk in the markets they serve. The effectiveness

employs a multi-tiered arrangement for the custody and transfer of ownership of securities (or the transfer of similar interests therein) in which investors are identified only at the level of their custodian or intermediary.

[5] A securities registrar is an entity that provides the service of preparing and recording accurate, current, and complete securities registers for securities issuers.

[6] Through novation, the original contract between the buyer and seller is extinguished and replaced by two new contracts, one between the CCP and the buyer, and the other between the CCP and the seller. In an open-offer system, a CCP is automatically and immediately interposed in a transaction at the moment the buyer and seller agree on the terms.

of a CCP's risk controls and the adequacy of its financial resources are critical to achieving these risk-reduction benefits.

Trade repositories

15. A trade repository (TR) is an entity that maintains a centralised electronic record (database) of transaction data.[7] TRs have emerged as a new type of FMI and have recently grown in importance. By centralising the collection, storage, and dissemination of data, a well-designed TR that operates with effective risk controls can serve an important role in enhancing the transparency of transaction information to relevant authorities and the public, promoting financial stability, and supporting the detection and prevention of market abuse. An important function of a TR is to provide information that supports risk reduction, operational efficiency and effectiveness, and cost savings for both individual entities and the market as a whole. Such entities may include the principals to a trade, their agents, CCPs, and other service providers offering complementary services, including central settlement of payment obligations, electronic novation and affirmation, and collateral.

1.4 Infrastructures in the ICM

16. The principal points at which FMIs interact with the ICM are in relation to the issuance and trading of *sukūk* and Sharīʿah-compliant equities. Where units of Islamic collective investment schemes are directly traded, as in closed-ended funds or exchange traded funds, they have in this respect similar characteristics to Sharīʿah-compliant equities. There may also be trading of other Sharīʿah-compliant assets, for example commodities for physical delivery. Depending on the role of the FMI, the trading may take place on- or off-exchange. For Sharīʿah reasons, derivatives are not a material feature of Islamic capital markets.

17. Sharīʿah-compliant equities are equities which have been identified as Sharīʿah-compliant following a screening process overseen by a Sharīʿah board. In some instances, this is a purely private process undertaken, for example, by an index provider. In others it is undertaken by or under the auspices of an RSA or an exchange. Even in the latter case, the

[7] In practice, the functions of a TR may, where permitted by applicable law, also be performed by a payment system, CSD, or CCP in addition to its core functions. A TR may also in practice provide or support ancillary services such as the management of trade life-cycle events and downstream trade-processing services based on the records it maintains.

designation may not be actively sought by the issuer[8] and therefore does not imply a continuing commitment to maintaining Sharīʿah compliance.[9] In the case of both Sharīʿah-compliant equities and *sukūk*, investors may or may not themselves be sensitive to Sharīʿah compliance.[10]

18. The approach of this standard has been to consider what would be involved in offering end-to-end Sharīʿah compliance of their ICM transactions for those investors who wish it, whether or not the FMIs also offer non-compliant services. For convenience, it refers to those FMIs that offer compliance for their part of the transaction as "Islamic FMIs".

1.5 General Approach of the CPIFRFMI

19. In relation to IFSB standards, there are two approaches that the IFSB adopts; comprehensive and supplementary. A "comprehensive" approach involves providing complete regulatory and supervisory guidance for Islamic finance, including certain principles directly from conventional standards which do not require any changes by the IFSB and are retained un-amended (because they are equally applicable to both Islamic and conventional finance and do not raise any Sharīʿah issue). A "supplementary" approach may involve only providing specific regulatory and supervisory guidance for Islamic finance that requires modification of conventional standards to meet the specificities of Islamic finance as well as additional aspects not covered by conventional standards.

20. The CPIFR FMI standard follows a comprehensive approach to ensure completeness of the standard, to enable consistency in assessment across both conventional and Islamic FMIs and for ease of reference. This approach has involved the introduction of a new principle dealing with *Sharīʿah* governance, which is an area peculiar to Islamic FMIs. Other material addressing Islamic specificities has been added at the Key Consideration, Question and Explanatory Note levels of each relevant Principle or Responsibility of Authorities for FMIs. Some references to practices which, for *Sharīʿah* reasons, are not features of the ICM have

[8] Depending on the rules of the particular jurisdiction.

[9] See IFSB-24 Principles 6 and 7 for a description of good regulatory practice in this area.

[10] For example, an individual investor who is Sharī'ah sensitive may sell shares in a telecoms company, those shares having been identified as Sharī'ah-compliant. They may be bought by an institutional investor which has no concern for Sharī'ah compliance, and which also trades in non-compliant instruments. Several FMIs are likely to be involved in supporting this trade.

been removed. A mapping indicating the relationship between this standard and the CPSS-IOSCO Documents is provided in the appendix.

1.6 Disclosure Framework for Islamic FMIs

21. The disclosure framework is intended to promote a base level of transparency for information about FMIs. This transparency is intended to assist participants, authorities and the broader public in better understanding the activities of an FMI, its risk profile and its risk management practices and will thus support sound decision-making by FMIs and their stakeholders. In this way, the disclosure framework will achieve the greater public policy goal of strengthening financial stability.

22. The objective of the disclosure framework is to improve the overall transparency of the FMI and its governance, operations and risk management framework for a broad audience that includes current and prospective participants in the FMI, other market participants, authorities and the general public. Greater market transparency supports the public policy objectives to enhance the safety and efficiency in payment, clearing, settlement and recording arrangements, and, more broadly, to foster financial stability.

23. The Disclosure Framework for Islamic FMIs is set out in Annex H: *Principle-by-principle summary narrative disclosure*. While this is based on the corresponding framework in the CPSS-IOSCO Documents, there are Islamic finance specificities which need to be disclosed for the purpose of transparency and clarity. This includes adequate disclosure of Sharī'ah compliance processes in relation to products and services, and the general rights, responsibilities and exposures of FMI participants based on the underlying Sharī'ah-compliant contracts.

1.7 Assessment Methodology for the Principles and Responsibilities of Authorities for FMIs

24. The purpose of having an assessment methodology is to promote consistent implementation and ongoing observance of the principles for FMIs and responsibilities of authorities. Although specific objectives may differ by assessment, a common goal among all assessors is to determine whether and how well an FMI observes the principles or an authority fulfils the responsibilities. In addition, the assessment methodology serves to promote full observance of the principles and fulfilment of the responsibilities by allowing assessors to identify issues of concern that should be addressed.

25. The assessment methodology for this standard is set out in Annexes A–E. It is closely based on that in the CPSS-IOSCO Documents. However, for an assessment against this standard it is recommended that an assessor should be well versed with Islamic finance knowledge in order to assign an appropriate rating and recommendation based on his or her observation, especially on areas where the specificities of Islamic finance are applicable in the FMIs.

26. This methodology is intended to apply to FMIs that undertake Sharīʿah-compliant activities and transactions, pursuant to the legal and regulatory approach taken by a jurisdiction in the regulation of Islamic finance in that jurisdiction. Where an FMI undertakes both conventional transactions and transactions held out as being Sharīʿah-compliant, this methodology applies to the latter. At some points, achieving compliance with it may require a clear segregation between the two classes of transaction, the assets that support them, etc., but this will not necessarily be the case in all instances (e.g. in purely record-keeping functions).

1.8 Implementation Date

27. To encourage consistency in implementation of IFSB standards across jurisdictions, it is recommended that RSAs implement the standard in their jurisdictions effective from January 2024 onwards, taking into account an adequate pre-implementation period starting from the issuance date of this standard for the standard to be embedded into national regulations and guidelines, and where applicable, implemented into supervisory practices. RSAs are encouraged to implement the standard earlier than this date, where they are able and comfortable to do so.

28. The level of implementation of the standard in a particular jurisdiction may be dependent upon, and be without prejudice to, the general legal framework of that particular jurisdiction.

SECTION 2: OVERVIEW OF KEY RISKS IN ISLAMIC FINANCIAL MARKET INFRASTRUCTURES

2.1 Key Risks for Islamic FMIs

29. In general, and with one important exception, the risks faced by Islamic FMIs are similar to those applicable to their conventional counterparts. Some of these risks are, however, mitigated for Islamic FMIs by the fact that derivatives, and also short selling, are for Sharīʿah reasons not material features of the ICM.[11] On the other hand, some hedging instruments available to conventional FMIs are not available to Islamic FMIs. All references to "hedging" in the context of Islamic FMIs should therefore be taken to refer to the one of the types of hedging defined in resolution number 238 (24/9) by the International Fiqh Academy, issued on 6 November 2019.

2.2 Sharīʿah Non-compliance Risk

30. The important exception referred to above is that an Islamic FMI will be subject to an additional category of risk: Sharīʿah non-compliance risk (SNCR). This is defined in the IFSB Glossary as "*An operational risk resulting from non-compliance of the institution with the rules and principles of Sharīʿah in its products and services*." It is a form of risk which is managed and mitigated by appropriate Sharīʿah governance arrangements, as discussed in Principle 20. The paragraphs which follow discuss key areas of possible SNCR in particular FMIs and transaction types.

31. For systemically significant **payment systems** there appear to be no issues. Payment systems exist simply to move value securely and do so on the basis of fees rather than interest.

32. There also appear to be no issues for **TRs**, whose role is simply to record and disseminate information about trades that have taken place, including trades that have taken place over the counter.

[11] In some jurisdictions local interpretations of Sharīʿah have permitted the use of structures which may be used to achieve similar economic outcomes to short selling.

33. Similarly, there appear to be very few issues for **CSDs** in their primary role, which is fundamentally that of a custodian and book-keeper. Such issues as there are will be around ancillary activities. For example, a CSD may arrange insurance against misappropriation, theft etc.; to achieve full Sharī'ah compliance, this would need to be on a *takāful* basis. Some conventional CSDs are also involved as principal in securities borrowing and lending arrangements, which do raise Sharī'ah issues.

34. The FMIs for which the greatest SNCR issues arise are **CCPs**. A CCP becomes a party to every trade and has the fundamental role of ensuring that trades can be settled even if a party defaults. To do this, it will hold substantial financial resources, either its own funds or collateral deposited by participants, or both. The types of asset that can be accepted, and the way in which resources can be held, will raise Sharī'ah issues. So will the way these resources can be deployed. There will typically be a default fund[12] and the way in which this fund is structured and used may also raise issues. The processes for dealing with a default may also raise issues, where the defaulting party acts on behalf of many clients. A common aim will be to protect their clients and transfer their trading positions to another, non-defaulting, member, but this may not be straightforward. All these issues are discussed in more detail later. A CCP from a Sharīʿah perspective undertakes the settlement of transactions by delivery of assets and payments and is not a buyer or a seller in the transaction's origin. Regulations should be in line with this reality.[13] If a seller defaults in delivery of the asset, the CCP will, on the buyer's behalf, buy an asset and deliver to the buyer using in the first instance the collateral deposited by the seller to the CCP. If the buyer defaults, the CCP will make the payment on the buyer's behalf from the collateral he has deposited to the CCP. If the participant's funds are not sufficient, a CCP will use its own financial resources to settle a default and claim them

[12] Sometimes called a guarantee fund, but in CCPs not generally based on a guarantee contract as such contracts are normally understood.

[13] Considering the CCP as a party that undertakes the settlement of transactions by delivery of assets and payments, and not as a buyer or a seller in the transaction's origin, is fundamentally an interpretation of what the current contract pattern of a CCP already achieves in Sharīʿah terms and does not imply a contract of guarantee (*kafalah*). The fundamental function of a CCP is to place itself between the buyer and seller of an original trade and effectively guarantee the obligations under the contract agreed between the two parties, both of which would be participants of the CCP. The existing contractual terms of a CCP facilitate this function and allow it to ensure the timely settlement of all transactions and to deal effectively with any defaults. Any entity with different contractual terms would not be able to achieve this outcome and would not meet the internationally understood definition of a CCP.

back from the defaulting participant. If financial resources provided by other participants are used, the defaulting participant will remain liable until he pays them back (with no interest).

35. **SSSs** may hold positive or negative cash balances – though usually for very limited periods – and the issue of interest may therefore arise. Greater issues may arise in trading systems that do not have a CCP. In those systems, the SSS sometimes operates a guarantee fund (default fund) intended to ensure that trades can be settled in the event of at least small-scale defaults. This will raise Sharīʻah issues analogous to those for a CCP, though with the important difference that the SSS, unlike a CCP, will not be a party to the trades it is settling. Different contractual principles may therefore apply. Any guarantee structure used by an SSS to support transactions for which it claims Sharīʻah compliance should itself be Sharīʻah-compliant, as determined by the Sharīʻah board advising the SSS.

2.3 General Risks

36. Risks that are common to both conventional and Islamic FMIs are outlined below.

2.3.1 Systemic Risk

37. Safe and efficient FMIs mitigate systemic risk. FMIs may themselves face systemic risk, however, because the inability of one or more participants to perform as expected could cause other participants to be unable to meet their obligations when due. In such circumstances, a variety of "knock-on" effects are possible, and an FMI's inability to complete settlement could have significant adverse effects on the markets it serves and the broader economy. These adverse effects, for example, could arise from unwinding or reversing payments or deliveries; delaying the settlement or close out of transactions; or immediately liquidating collateral or other assets at fire sale prices. If an FMI were to take such steps, its participants could suddenly be faced with significant and unexpected credit and liquidity exposures that might be extremely difficult to manage at the time. This, in turn, might lead to further disruptions in the financial system and undermine public confidence in the safety, soundness, and reliability of the financial infrastructure.

38. More broadly, FMIs may be linked to or dependent upon one another, may have common participants, and may serve interconnected institutions and markets. Complex interdependencies may be a normal part of an FMI's structure or operations. In many cases, interdependencies have facilitated significant improvements in the safety and efficiency of FMIs' activities and processes. Interdependencies, however, can also present an important

source of systemic risk.[14] For example, these interdependencies raise the potential for disruptions to spread quickly and widely across markets. If an FMI depends on the smooth functioning of one or more FMIs for its payment, clearing, settlement, and recording processes, a disruption in one FMI can disrupt other FMIs simultaneously. These interdependencies, consequently, can transmit disruptions beyond a specific FMI and its participants and affect the broader economy.

2.3.2 Legal Risk

39. For the purposes of this standard, legal risk is the risk of the unexpected application of a law or regulation, usually resulting in a loss. Legal risk can also arise if the application of relevant laws and regulations is uncertain. For example, legal risk encompasses the risk that a counterparty faces from an unexpected application of a law that renders contracts illegal or unenforceable. Legal risk also includes the risk of loss resulting from a delay in the recovery of financial assets or a freezing of positions resulting from a legal procedure. In cross-border as well as some national contexts, different bodies of law can apply to a single transaction, activity, or participant. In such instances, an FMI and its participants may face losses resulting from the unexpected application of a law, or the application of a law different from that specified in a contract, by a court in a relevant jurisdiction.

2.3.3 Credit Risk

40. FMIs and their participants may face various types of credit risk, which is the risk that a counterparty, whether a participant or other entity, will be unable to meet fully its financial obligations when due, or at any time in the future. FMIs and their participants may face replacement-cost risk (often associated with pre-settlement risk) and principal risk (often associated with settlement risk). Replacement-cost risk is the risk of loss of unrealised gains on unsettled transactions with a counterparty (e.g. the unsettled transactions of a CCP). The resulting exposure is the cost of replacing the original transaction at current market prices. Principal risk is the risk that a counterparty will lose the full value involved in a transaction, for example, the risk that a seller of a financial asset will irrevocably deliver the asset but not

[14] See also CPSS, The interdependencies of payment and settlement systems, June 2008.

receive payment. Credit risk can also arise from other sources, such as the failure of settlement banks, custodians, or linked FMIs to meet their financial obligations.

2.3.4 Liquidity Risk

41. FMIs and their participants may face liquidity risk, which is the risk that a counterparty, whether a participant or other entity, will have insufficient funds to meet its financial obligations as and when expected, although it may be able to do so in the future. Liquidity risk includes the risk that a seller of an asset will not receive payment when due, and the seller may have to borrow or liquidate assets to complete other payments. Liquidity problems have the potential to create systemic problems, particularly if they occur when markets are closed or illiquid or when asset prices are changing rapidly, or if they create concerns about solvency. Liquidity risk can also arise from other sources, such as the failure or the inability of settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs to perform as expected.

2.3.5 General Business Risk

42. In addition, FMIs face general business risks, which are the risks related to the administration and operation of an FMI as a business enterprise, excluding those related to the default of a participant or another entity, such as a settlement bank, global custodian, or another FMI. General business risk refers to any potential impairment of the financial condition (as a business concern) of an FMI due to declines in its revenues or growth in its expenses, resulting in expenses exceeding revenues and a loss that must be charged against capital. Such impairment may be a result of adverse reputational effects, poor execution of business strategy, ineffective response to competition, losses in other business lines of the FMI or its parent, or other business factors. Business-related losses also may arise from risks covered by other principles, for example, legal or operational risk. A failure to manage general business risk could result in a disruption of an FMI's business operations.

2.3.6 Custody and Investment Risks

43. FMIs may also face custody and investment risks on the assets that they own and those they hold on behalf of their participants. Custody risk is the risk of loss on assets held in custody in the event of a custodian's (or sub-custodian's) insolvency, negligence, fraud, poor administration, or inadequate record-keeping. Investment risk is the risk of loss faced by an FMI when it invests its own or its participants' resources, such as collateral. These risks can be relevant not only to the costs of holding and investing resources but also to the safety and

reliability of an FMI's risk management systems. The failure of an FMI to properly safeguard its assets could result in credit, liquidity, and reputational problems for the FMI itself.

2.3.7 Operational Risk

44. All FMIs face operational risk, which is the risk that deficiencies in information systems or internal processes, human errors, management failures, or disruptions from external events will result in the reduction, deterioration, or breakdown of services provided by an FMI. These operational failures may lead to consequent delays, losses, liquidity problems, and in some cases systemic risks. Operational deficiencies also can reduce the effectiveness of measures that FMIs may take to manage risk, for example, by impairing their ability to complete settlement, or by hampering their ability to monitor and manage their credit exposures. In the case of TRs, operational deficiencies could limit the usefulness of the transaction data maintained by a TR. Possible operational failures include errors or delays in processing, system outages, insufficient capacity, fraud, and data loss and leakage. Operational risk can stem from both internal and external sources. For example, participants can generate operational risk for FMIs and other participants, which could result in liquidity or operational problems within the broader financial system.

SECTION 3: CORE PRINCIPLES FOR ISLAMIC FINANCIAL MARKET INFRASTRUCTURES

3.1 Preamble

45. This section reflects the materials from the CPSS-IOSCO Documents, with necessary additions, modifications or deletion of material where relevant, to address the specificities of supervision and regulation of Islamic FMIs. For ease of reference and consistency, the numberings and the sequence of each of the Principles, Responsibility of Authorities for FMIs, Key Considerations and Questions presented in this section are in line with the format of the CPSS-IOSCO Documents (with the exception of the explanatory notes which are numbered differently). The format enables the use of this document on its own, as a standalone standard for assessment of FMIs that are Sharīʿah-compliant, while also providing ease of reference to the equivalent material in CPSS-IOSCO Documents.

46. The structure for each Principle and Responsibility of Authorities for FMIs presented in this section will have the following sequence (where applicable):

(i) Key considerations;

(ii) Questions by key consideration; and

(iii) Explanatory note.

47. Generally, unless specified otherwise, all references made to the products[15] and services of FMIs in this standard assume that those products and services are, or are intended to be, Sharīʿah-compliant.

48. At the beginning of each Principle and Responsibility of Authorities for FMIs in this section, an indication box (on top-left) is placed to indicate which types of FMIs the materials are applicable to.

[15] The term "product" here refers to any product that may have been created by the FMI itself to facilitate Islamic capital markets activity, for example Islamic repurchase agreements.

General organisation

PS	CSD	SSS	CCP	TR
●	●	●	●	●

Principle 1: Legal basis

An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

49. As a robust legal basis for an FMI's activities in all relevant jurisdictions is critical to an FMI's overall soundness, this principle should be reviewed holistically with the other principles.

Key considerations

1. *The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.*

2. *An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.*

3. *An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.*

4. *An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.*

5. *An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws or Sharīʿah interpretations across jurisdictions.*

Questions by key consideration

Key consideration 1:

Material aspects and relevant jurisdictions

Q.1.1.1: What are the material aspects of the FMI's activities that require a high degree of legal certainty (e.g. rights and interests in financial instruments; settlement finality; netting; interoperability; immobilisation and dematerialisation of securities; arrangements for DvP, PvP or DvD; collateral arrangements; and default procedures)?

Q.1.1.2: What are the relevant jurisdictions for each material aspect of the FMI's activities?

Legal basis for each material aspect

Q.1.1.3: How does the FMI ensure that its legal basis (i.e. the legal framework and the FMI's rules, procedures and contracts) provides a high degree of legal certainty for each material aspect of the FMI's activities in all relevant jurisdictions?

a) For an FMI that is a CSD, how does the CSD ensure that its legal basis supports the immobilisation or dematerialisation of securities and the transfer of securities by book entry?

b) For an FMI that is a CCP, how does the CCP ensure that its legal basis enables it to act as a CCP, including the legal basis for novation, open offer or other similar legal device? Does the CCP state whether novation, open offer or other similar legal device can be revoked or modified? If yes, in which circumstances?

c) For an FMI that is a TR, how does the TR ensure that its legal basis protects the records it maintains? How does the legal basis define the rights of relevant stakeholders with respect to access, confidentiality and disclosure of data?

d) For an FMI that has a netting arrangement, how does the FMI ensure that its legal basis supports the enforceability of that arrangement?

e) Where settlement finality occurs in an FMI, how does the FMI ensure that its legal basis supports the finality of transactions, including those of an insolvent participant? Does the legal basis for the external settlement mechanisms the FMI uses, such as funds transfer or securities transfer systems, also support this finality?

***Key consideration 2**:*

Q.1.2.1: How has the FMI demonstrated that its rules, procedures and contracts are clear and understandable?

Q.1.2.2: How does the FMI ensure that its rules, procedures and contracts are consistent with relevant laws and regulations (e.g. through legal opinions or analyses)? Have any inconsistencies been identified and remedied? Are the FMI's rules, procedures and contracts reviewed or assessed by external authorities or entities?

Q.1.2.3: Do the FMI's rules, procedures and contracts have to be approved before coming into effect? If so, by whom and how?

Key consideration 3:

Q.1.3.1: How does the FMI articulate the legal basis for its activities to relevant authorities, participants and, where relevant, participants' customers?

Key consideration 4:

Enforceability of rules, procedures and contracts

Q.1.4.1: How does the FMI achieve a high level of confidence that the rules, procedures and contracts related to its operations are enforceable in all relevant jurisdictions identified in key consideration 1 (e.g. through legal opinions and analyses)?

Degree of certainty for rules and procedures

Q.1.4.2: How does the FMI achieve a high degree of certainty that its rules, procedures and contracts will not be voided, reversed or subject to stays? Are there any circumstances in which an FMI's actions under its rules, procedures or contracts could be voided, reversed or subject to stays? If so, what are those circumstances?

Q.1.4.3: Has a court in any relevant jurisdiction ever held any of the FMI's relevant activities or arrangements under its rules and procedures to be unenforceable?

***Key consideration 5**:*

Q.1.5.1: If the FMI is conducting business in multiple jurisdictions, how does the FMI identify and analyse any potential conflict-of-laws issues or any conflict of Sharī'ah interpretation that would have implications for the legal basis on which it operates? When uncertainty exists regarding the enforceability of an FMI's choice of law, or Sharī'ah interpretation in relevant jurisdictions, has the FMI obtained an independent legal analysis of potential conflict-of-laws issues? What potential conflict-of-laws issues has the FMI identified and analysed? How has the FMI addressed any potential conflict-of-laws issues?

Explanatory note

50. A robust legal basis for an FMI's activities in all relevant jurisdictions is critical to an FMI's overall soundness. The legal basis defines, or provides the foundation for relevant parties to define, the rights and obligations of the FMI, its participants, and other relevant parties, such as its participants' customers, custodians, settlement banks, and service providers. Most risk management mechanisms are based on assumptions about the manner and time at which these rights and obligations arise through the FMI. Therefore, if risk management is to be sound and effective, the enforceability of rights and obligations relating to an FMI and its risk management should be established with a high degree of certainty. If the legal basis for an FMI's activities and operations is inadequate, uncertain, or opaque, then the FMI, its participants, and their customers may face unintended, uncertain, or unmanageable credit or liquidity risks, which may also create or amplify systemic risks.

Legal basis

51. The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.[16] The legal basis consists of the legal framework and the FMI's rules, procedures, and contracts. The legal framework includes general laws and regulations that govern, among other things, property, contracts, insolvency, corporations, securities, banking, secured interests, and liability. In some cases, the legal framework that governs competition and consumer and investor protection may also be relevant. Laws and regulations specific to an FMI's activities include those governing its authorisation and its regulation, supervision, and oversight; rights and interests in financial instruments; settlement finality; netting; immobilisation and dematerialisation of securities; arrangements for DvP, PvP, or DvD; collateral arrangements; default procedures; and the resolution of an FMI. An FMI should establish rules, procedures, and contracts that are clear, understandable, and consistent with the legal framework and provide a high degree of legal certainty. An FMI also should consider whether the rights and obligations of the FMI, its participants, and as appropriate, other parties, as set forth in its rules, procedures, and contracts are consistent with relevant industry standards and market protocols.

52. An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers in a clear and understandable way. One recommended approach to articulating the legal basis for each material aspect of an FMI's activities is to obtain well-reasoned and independent legal opinions or analyses. A legal opinion or analysis should, to the extent practicable, confirm the enforceability of the FMI's rules and procedures and must provide reasoned support for its conclusions. An FMI should consider sharing these legal opinions and analyses with its participants in an effort to promote confidence among participants and transparency in the system. In addition, an FMI should seek to ensure that its activities are consistent with the legal basis in all relevant jurisdictions. These jurisdictions could include: (a) those where an

[16] The materiality of an aspect of an FMI´s activity has to be determined in light of this report's objectives – enhancing safety and efficiency – and underlying principles. Therefore, an aspect of an FMI's activities is or becomes material if it can be a source of a material risk, especially, but not limited to, credit, liquidity, general business, custody, investment, or operational risks. In addition, parts of the activity that have a significant effect on the FMI's efficiency may also qualify as material aspects of the activity covered by the principle on legal basis.

FMI is conducting business (including through linked FMIs); (b) those where its participants are incorporated, located, or otherwise conducting business for the purposes of participation; those where collateral is located or held; and (d) those indicated in relevant contracts.

53. A TR's rules, procedures, and contracts should be clear about the legal status of the transaction records that it stores. Most TRs store transaction data that do not represent legally enforceable trade records. For some TRs, however, participants may agree that the TR's electronic transaction record provides the official economic details of a legally binding contract, which enables trade details to be used for the calculation of payment obligations and other events that may occur during the life of the transaction. A TR should identify and mitigate any legal risks associated with any such ancillary services that it may provide. Further, the legal basis should also determine the rules and procedures for providing access and disclosing data to participants, relevant authorities, and the public to meet their respective information needs, as well as data protection and confidentiality issues (see also Principle 24 on disclosure of market data by TRs).

Rights and interests

54. The legal basis should clearly define the rights and interests of an FMI, its participants, and, where relevant, its participants' customers in the financial instruments, such as cash and securities, or other relevant assets held in custody, directly or indirectly, by the FMI. The legal basis should fully protect both a participant's assets held in custody by the FMI and, where appropriate, a participant's customer's assets held by or through the FMI from the insolvency of relevant parties and other relevant risks. It should also protect these assets when held at a custodian or linked FMI. In particular, consistent with Principle 11 on CSDs and Principle 14 on segregation and portability, the legal basis should protect the assets and positions of a participant's customers in a CSD and CCP. In addition, the legal basis should provide certainty, where applicable, with respect to an FMI's interests in, and rights to use and dispose of, collateral; an FMI's authority to transfer ownership rights or property interests; and an FMI's rights to make and receive payments, in all cases, notwithstanding the bankruptcy or insolvency of its participants, participants' customers, or custodian bank.[17] Also, the FMI

[17] Collateral arrangements may involve either a pledge or a title transfer, including transfer of full ownership. If an FMI accepts a pledge, it should have a high degree of certainty that the pledge has been validly created in the

should structure its operations so that its claims against collateral provided to it by a participant should have priority over all other claims, and the claims of the participant to that same collateral should have priority over the claims of third-party creditors. For TRs, the legal basis also should specifically define the rights and interests of participants and other relevant stakeholders with respect to the data stored in the TR's systems.

Settlement finality

55. There should be a clear legal basis regarding when settlement finality occurs in an FMI in order to define when key financial risks are transferred in the system, including the point at which transactions are irrevocable. Settlement finality is an important building block for risk management systems (see also Principle 8). An FMI should consider, in particular, the actions that would need to be taken in the event of a participant's insolvency. A key question is whether transactions of an insolvent participant would be honoured as final, or could be considered void or voidable by liquidators and relevant authorities. In some countries, for example, so-called "zero-hour rules" in insolvency law can have the effect of reversing a payment that appears to have been settled in a payment system.[18] Because this possibility can lead to credit and liquidity risks, zero-hour rules that undermine settlement finality should be eliminated. An FMI also should consider the legal basis for the external settlement mechanisms it uses, such as funds transfer or securities transfer systems. The laws of the relevant jurisdictions should support the provisions of the FMI's legal agreements with its participants and settlement banks relating to finality.

Netting arrangements

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relevant jurisdiction and validly perfected, if necessary. If an FMI relies on a title transfer, including transfer of full ownership, it should have a high degree of certainty that the transfer is validly created in the relevant jurisdiction and will be enforced as agreed and not recharacterised, for example, as an invalid or unperfected pledge or some other unintended category of transaction. An FMI should also have a high degree of certainty that the transfer itself is not voidable as an unlawful preference under insolvency law. See also Principle 5 on collateral, Principle 6 on calculation of collateral, and Principle 13 on participant-default rules and procedures.

[18] In the context of payment systems, "zero-hour rules" make all transactions by a bankrupt participant void from the start ("zero hour") of the day of the bankruptcy (or similar event). In an RTGS system, for example, the effect could be to reverse payments that have apparently already been settled and were thought to be final. In a DNS system, such a rule could cause the netting of all transactions to be unwound. This could entail a recalculation of all net positions and could cause significant changes to participants' balances.

56. If an FMI has a netting arrangement, the enforceability of the netting arrangement should have a sound and transparent legal basis.[19] In general, netting offsets obligations between or among participants in the netting arrangement, thereby reducing the number and value of payments or deliveries needed to settle a set of transactions. Netting can reduce potential losses in the event of a participant default and may reduce the probability of a default.[20] Netting arrangements should be designed to be explicitly recognised and supported under the law and enforceable against an FMI and an FMI's failed participants in bankruptcy. Without such legal underpinnings, net obligations may be challenged in judicial or administrative insolvency proceedings. If these challenges are successful, the FMI and its participants could be liable for gross settlement amounts that could drastically increase obligations because gross obligations could be many multiples of net obligations.

57. Novation, open offer, and other similar legal devices that enable an FMI to act as a CCP should be founded on a sound legal basis.[21] In novation (and substitution), the original contract between the buyer and seller is discharged and two new contracts are created, one between the CCP and the buyer and the other between the CCP and the seller. The CCP thereby assumes the original parties' contractual obligations to each other. In an open-offer system, the CCP extends an open offer to act as a counterparty to market participants and thereby is interposed between participants at the time a trade is executed. If all pre-agreed conditions are met, there is never a contractual relationship between the buyer and seller. Where supported by the legal framework, novation, open offer, and other similar legal devices give market participants legal certainty that a CCP is supporting the transaction.

Enforceability

58. The rules, procedures, and contracts related to an FMI's operation should be enforceable in all relevant jurisdictions. In particular, the legal basis should support the

[19] There are several types of netting arrangements used in the market that may be relevant to an FMI. Some types of arrangements net payments or other contractual obligations resulting from market trades (or both) on an ongoing basis, while others close-out payments or obligations when an event such as insolvency occurs. There are a number of legal structures for these types of netting arrangements.

[20] An FMI may bilaterally net its obligations with each participant, facilitate the bilateral netting of obligations between participants, or provide for the multilateral netting of obligations.

[21] In some countries, for example, assumption of obligation may be used instead of arrangements to replace the original contract between the buyer and seller with the two new contracts.

enforceability of the participant-default rules and procedures that an FMI uses to handle a defaulting or insolvent participant, especially any transfers and close-outs of a direct or indirect participant's assets or positions (see also Principle 13 on participant-default rules and procedures). An FMI should have a high degree of certainty that such actions taken under such rules and procedures will not be voided, reversed, or subject to stays, including with respect to the resolution regimes applicable to its participants.[22] Ambiguity about the enforceability of procedures could delay and possibly prevent an FMI from taking actions to fulfil its obligations to non-defaulting participants or to minimise its potential losses. Insolvency law should support isolating risk and retaining and using collateral and cash payments previously paid into an FMI, notwithstanding a participant default or the commencement of an insolvency proceeding against a participant.

59. An FMI should establish rules, procedures, and contracts related to its operations that are enforceable when the FMI is implementing its plans for recovery or orderly wind-down. Where relevant, they should adequately address issues and associated risks resulting from (a) cross-border participation and interoperability of FMIs and (b) foreign participants in the case of an FMI which is being wound down. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays. Ambiguity about the enforceability of procedures that facilitate the implementation of the FMI's plans for recovery or orderly wind-down, or the resolution of the FMI, could delay and possibly prevent the FMI or the relevant authorities from taking appropriate actions and hence increase the risk of a disruption to its critical services or a disorderly wind-down of the FMI. In the case that an FMI is being wound down or resolved, the legal basis should support decisions or actions concerning termination, close-out netting, the transfer of cash and securities positions of an FMI, or the transfer of all or parts of the rights and obligations provided in a link arrangement to a new entity.

Conflict-of-laws issues

60. Legal risk due to conflict of laws may arise if an FMI is, or reasonably may become, subject to the laws of various other jurisdictions (e.g. when it accepts participants established

[22] However, rights triggered only because of entry into resolution or the exercise of resolution powers may be subject to stays. See for example FSB, *Key attributes of effective resolution regimes for financial institutions*, KA 4.2, 4.3, and Annex IV, paragraph 1.3.

in those jurisdictions, when assets are held in multiple jurisdictions, or when business is conducted in multiple jurisdictions). In such cases, an FMI should identify and analyse potential conflict-of-laws issues and develop rules and procedures to mitigate this risk. For example, the rules governing its activities should clearly indicate the law that is intended to apply to each aspect of an FMI's operations. The FMI and its participants should be aware of applicable constraints on their abilities to choose the law that will govern the FMI's activities when there is a difference in the substantive laws of the relevant jurisdictions. For example, such constraints may exist because of jurisdictions' differing laws on insolvency and irrevocability. A jurisdiction ordinarily does not permit contractual choices of law that would circumvent that jurisdiction's fundamental public policy. Thus, when uncertainty exists regarding the enforceability of an FMI's choice of law in relevant jurisdictions, the FMI should obtain reasoned and independent legal opinions and analysis in order to address properly such uncertainty.

61. Where an FMI conducts its business in multiple jurisdictions, it should assess and manage the risk that different Sharīʿah interpretations may have implications for the legal basis on which it operates – for example, where those interpretations may form the basis of a challenge to the FMI's contracts, etc.

Mitigating legal risk

62. In general, there is no substitute for a sound legal basis and full legal certainty. In some practical situations, however, full legal certainty may not be achievable. In this case, the authorities may need to take steps to address the legal framework. Pending this resolution, an FMI should investigate steps to mitigate its legal risk through the selective use of alternative risk management tools that do not suffer from the legal uncertainty identified. These could include, in appropriate circumstances and if legally enforceable, participant requirements, exposure limits, collateral requirements, and prefunded default arrangements. The use of such tools may limit an FMI's exposure if its activities are found to be not supported by relevant laws and regulations. If such controls are insufficient or not feasible, an FMI could apply activity limits and, in extreme circumstances, restrict access or not perform the problematic activity until the legal situation is addressed.

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Principle 2: Governance[23]

An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.

63. In reviewing this principle, it should be noted that if an FMI is wholly owned or controlled by another entity, the governance arrangements of that entity should also be reviewed to ensure that they do not have adverse effects on the FMI's observance of this principle. As governance provides the processes through which an organisation sets its objectives, determines the means for achieving those objectives and monitors performance against those objectives, this principle should be reviewed holistically with the other principles.

Key considerations

1. *An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.*

2. *An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.*

3. *The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest.*

[23] Aspects related to Sharīʿah governance are addressed in Principle 25.

The board should review both its overall performance and the performance of its individual board members regularly.

4. *The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).*

5. *The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.*

6. *The board should establish a clear, documented risk management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk management and internal control functions have sufficient authority, independence, resources, and access to the board.*

7. *The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.*

Questions by key consideration

Key consideration 1:

Q.2.1.1: What are the FMI's objectives, and are they clearly identified? How does the FMI assess its performance in meeting its objectives?

Q.2.1.2: How do the FMI's objectives place a high priority on safety and efficiency? How do the FMI's objectives explicitly support financial stability and other relevant public interest considerations?

Key consideration 2:

Governance arrangements

Q.2.2.1: What are the governance arrangements under which the FMI's board of directors (or equivalent), Sharī'ah board and management operate? What are the lines of responsibility and accountability within the FMI? How and where are these arrangements documented?

Q.2.2.2: For central bank-operated systems, how do governance arrangements address any possible or perceived conflicts of interest? To what extent do governance arrangements allow for a separation of the operator and oversight functions?

Q.2.2.3: How does the FMI provide accountability to owners, participants and other relevant stakeholders?

Disclosure of governance arrangements

Q.2.2.4: How are the governance arrangements disclosed to owners, relevant authorities, participants and, at a more general level, the public?

Key consideration 3:

Roles and responsibilities of the board

Q.2.3.1: What are the roles and responsibilities of the FMI's board of directors (or equivalent), and are they clearly specified?

Q.2.3.2: What are the board's procedures for its functioning, including procedures to identify, address and manage member conflicts of interest? How are these procedures documented, and to whom are they disclosed? How frequently are they reviewed?

Q.2.3.3: Describe the board committees that have been established to facilitate the functioning of the board. What are the roles, responsibilities and composition of such committees?

Review of performance

Q.2.3.4: What are the procedures established to review the performance of the board as a whole and the performance of the individual board members?

Key consideration 4:

Q.2.4.1: To what extent does the FMI's board have the appropriate skills and incentives to fulfil its multiple roles? How does the FMI ensure that this is the case?

Q.2.4.2: What incentives does the FMI provide to board members so that it can attract and retain members of the board with appropriate skills? How do these incentives reflect the long-term achievement of the FMI's objectives?

Q.2.4.3: Does the board include non-executive or independent board members? If so, how many?

Q.2.4.4: If the board includes independent board members, how does the FMI define an independent board member? Does the FMI disclose which board member(s) it regards as independent?

Key consideration 5*:*

Roles and responsibilities of management

Q.2.5.1: What are the roles and responsibilities of management, and are they clearly specified?

Q.2.5.2: How are the roles and objectives of management set and evaluated?

Experience, skills and integrity

Q.2.5.3: To what extent does the FMI's management have the appropriate experience, mix of skills and the integrity necessary for the operation and risk management of the FMI? How does the FMI ensure that this is the case?

Q.2.5.4: What is the process to remove management if necessary?

Key consideration 6:

Risk management framework

Q.2.6.1: What is the risk management framework that has been established by the board? How is it documented?

Q.2.6.2: How does this framework address the FMI's risk tolerance policy, assign responsibilities and accountability for risk decisions (such as limits on risk exposures), and address decision-making in crises and emergencies?

Q.2.6.3: What is the process for determining, endorsing and reviewing the risk management framework?

Authority and independence of risk management and audit functions

Q.2.6.4: What are the roles, responsibilities, authority, reporting lines and resources of the risk management and audit functions?

Q.2.6.5: How does the board ensure that there is adequate governance surrounding the adoption and use of risk management models? How are these models and the related methodologies validated?

Key consideration 7:

Identification and consideration of stakeholder interests

Q.2.7.1: How does the FMI identify and take account of the interests of the FMI's participants and other relevant stakeholders in its decision-making in relation to its design, rules, overall strategy and major decisions?

Q.2.7.2: How does the board consider the views of direct and indirect participants and other relevant stakeholders on these decisions; for example, are participants included on the risk management committee, on user committees such as a default management group or through a public consultation? How are conflicts of interest between stakeholders and the FMI identified, and how are they addressed?

Disclosure

Q.2.7.3: To what extent does the FMI disclose major decisions made by the board to relevant stakeholders and, where appropriate, the public?

Explanatory note

64. Governance is the set of relationships between an FMI's owners, board of directors (or equivalent), Sharīʿah board, management, and other relevant parties, including participants, authorities, and other stakeholders (such as participants' customers, other interdependent FMIs, and the broader market). Governance provides the processes through which an organisation sets its objectives, determines the means for achieving those objectives, and monitors performance against those objectives. Good governance provides the proper incentives for an FMI's board and management to pursue objectives that are in the interest of its stakeholders and that support relevant public interest considerations.

FMI objectives

65. Given the importance of FMIs and the fact that their decisions can have widespread impact, affecting multiple financial institutions, markets, and jurisdictions, it is essential for each FMI to place a high priority on the safety and efficiency of its operations and explicitly support financial stability and other relevant public interests. Supporting the public interest is a broad concept that includes, for example, fostering fair and efficient markets. An FMI's governance arrangements should also include appropriate consideration of the interests of participants, participants' customers, relevant authorities, and other stakeholders. A TR, for example, should have objectives, policies, and procedures that support the effective and appropriate disclosure of market data to relevant authorities and the public (see Principle 24). For all types of FMIs, governance arrangements should provide for fair and open access (see Principle 18 on access and participation requirements) and for effective implementation of recovery or wind-down plans, or resolution.

Governance arrangements

66. Governance arrangements, which define the structure under which the board, Sharīʿah board and management operate, should be clearly and thoroughly documented. These arrangements should include certain key components such as the (a) role and composition of the board and any board committees, (b) role of the Sharīʿah board in the governance structure, (c) senior management structure, (d) reporting lines between management and the board, (e) ownership structure, (f) internal governance policy, (g) design of risk management and internal controls, (h) procedures for the appointment of board and Sharīʿah board members and senior management, and (i) processes for ensuring performance accountability. Governance arrangements should provide clear and direct lines of responsibility and accountability, particularly between management and the board, and ensure

sufficient independence for key functions such as risk management, internal control (including Sharī'ah control), and audit (including Sharī'ah audit). These arrangements should be disclosed to owners, the authorities, participants, and, at a more general level, the public.

67. No single set of governance arrangements is appropriate for all FMIs and all market jurisdictions. Arrangements may differ significantly because of national law, ownership structure, or organisational form. For example, national law may require an FMI to maintain a two-tier board system in which the supervisory board (all non-executive directors) is separated from the management board (all executive directors). Further, an FMI may be owned by its participants or by another organisation, may be operated as a for-profit or not-for-profit enterprise, or may be organised as a bank or non-bank entity. While specific arrangements vary, this principle is intended to be generally applicable to all ownership and organisational structures.

68. Depending on its ownership structure and organisational form, an FMI may need to focus particular attention on certain aspects of its governance arrangements. An FMI that is part of a larger organisation, for example, should place particular emphasis on the clarity of its governance arrangements, including in relation to any conflicts of interests and outsourcing issues that may arise because of the parent or other affiliated organisation's structure. The FMI's governance arrangements should also be adequate to ensure that decisions of affiliated organisations are not detrimental to the FMI. An FMI that is, or is part of, a for-profit entity may need to place particular emphasis on managing any conflicts between income generation and safety. For example, a TR should ensure that it effectively identifies and manages conflicts of interests that may arise between its public role as a centralised data repository and its own commercial interests, particularly if it offers services other than record-keeping. Where relevant, cross-border issues should be appropriately identified, assessed, and dealt with in the governance arrangements, both at the FMI level and at the level(s) of its parent entity(ies).

69. An FMI may also need to focus particular attention on certain aspects of its risk-management arrangements as a result of its ownership structure or organisational form. If an FMI provides services that present a distinct risk profile from, and potentially pose significant additional risks to, its payment, clearing, settlement, or recording function, the FMI needs to manage those additional risks adequately. This may include separating the additional services that the FMI provides from its payment, clearing, settlement, and recording function legally, or taking equivalent action. The ownership structure and organisational form may also need to be considered in the preparation and implementation of the FMI's recovery or wind-down plans or in assessments of the FMI's resolvability.

70. Central bank-operated systems may need to tailor the application of this principle in light of the central bank's own governance requirements and specific policy mandates. If a central bank is an operator of an FMI, as well as the overseer of private-sector FMIs, it needs to consider how to best address any possible or perceived conflicts of interest that may arise between those functions. Except when explicitly required by law, regulation, or policy mandates, a central bank should avoid using its oversight authority to disadvantage private-sector FMIs relative to an FMI the central bank owns or operates. This can be facilitated by separating the operator and oversight functions into different organisational units within the central bank that are managed by different personnel. Where there is competition with private-sector systems, a central bank should also be careful to protect confidential information about external systems collected in its role as overseer and avoid its misuse.

Roles, responsibilities, and composition of the board of directors

71. An FMI's board has multiple roles and responsibilities that should be clearly specified. These roles and responsibilities should include: (a) establishing clear strategic aims for the entity; (b) ensuring effective monitoring of senior management (including selecting its senior managers, setting their objectives, evaluating their performance, and, where appropriate, removing them); (c) establishing appropriate compensation policies (which should be consistent with best practices and based on long-term achievements, in particular, the safety and efficiency of the FMI); (d) establishing and overseeing the risk management function and material risk decisions; (e) overseeing internal control functions (including ensuring independence and adequate resources); (f) ensuring compliance with all supervisory and oversight requirements; (g) ensuring consideration of financial stability and other relevant public interests; (h) providing accountability to the owners, participants, and other relevant stakeholders; and (i) ensuring the FMI adheres to Sharīʻah rules and principles.

72. Policies and procedures related to the functioning of the board should be clear and documented. These policies include the responsibilities and functioning of board committees. A board would normally be expected to have, among others, a risk committee, an audit committee, and a compensation committee, or equivalents. All such committees should have

clearly assigned responsibilities and procedures.[24] Board policies and procedures should include processes to identify, address, and manage potential conflicts of interest of board members. Conflicts of interest include, for example, circumstances in which a board member has material competing business interests with the FMI. Further, policies and procedures should also include regular reviews of the board's performance and the performance of each individual member, as well as, potentially, periodic independent assessments of performance.

73. Governance policies related to board composition, appointment, and term should also be clear and documented. The board should be composed of suitable members with an appropriate mix of skills (including strategic and relevant technical skills), experience, knowledge of Islamic capital markets and Sharī'ah rules and principles as appropriate, and knowledge of the entity (including an understanding of the FMI's interconnectedness with other parts of the financial system). Members should also have a clear understanding of their roles in corporate governance, be able to devote sufficient time to their roles, ensure that their skills remain up-to-date, and have appropriate incentives to fulfil their roles. Members should be able to exercise objective and independent judgment. Independence from the views of management typically requires the inclusion of non-executive board members, including independent board members, as appropriate.[25] Definitions of an independent board member vary and often are determined by local laws and regulations, but the key characteristic of independence is the ability to exercise objective, independent judgment after fair consideration of all relevant information and views and without undue influence from executives or from inappropriate external parties or interests.[26] The precise definition of independence used by an FMI should be specified and publicly disclosed, and should exclude parties with significant business relationships with the FMI, cross-directorships, or controlling shareholdings, as well as employees of the organisation. Further, an FMI should publicly disclose which board members it regards as independent. An FMI may also need to consider setting a limit on the duration of board members' terms.

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[24] Such committees would normally be composed mainly of, and, if possible, led by, non-executive or independent directors (see also paragraph 3.2.10).

[25] Having non-executive members included on a board, for example, may (depending on local corporate law) help in balancing considerations of safety and efficiency with competitiveness and, where applicable, profitability.

[26] An FMI organised in a jurisdiction with national laws on board structure or composition that do not facilitate the use of independent members should use alternative means to enhance its board's ability to exercise independent judgment, such as advisory or supervisory boards with appropriate members.

Roles and responsibilities of management

74. An FMI should have clear and direct reporting lines between its management and board in order to promote accountability, and the roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI. Under board direction, management should ensure that the FMI's activities are consistent with the objectives, strategy, and risk tolerance of the FMI, as determined by the board. Management should ensure that internal controls and related procedures are appropriately designed and executed in order to promote the FMI's objectives, and that these procedures include a sufficient level of management oversight. Internal controls and related procedures should be subject to regular review and testing by well-trained and staffed risk management and internal-audit functions. Additionally, senior management should be actively involved in the risk-control process and should ensure that significant resources are devoted to its risk management framework.

Risk management governance

75. Because the board is ultimately responsible for managing an FMI's risks, it should establish a clear, documented risk management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. The board should regularly monitor the FMI's risk profile to ensure that it is consistent with the FMI's business strategy and risk-tolerance policy. In addition, the board should ensure that the FMI has an effective system of controls and oversight, including adequate governance and project management processes, over the models used to quantify, aggregate, and manage the FMI's risks. Board approval should be required for material decisions that would have a significant impact on the risk profile of the entity, such as the limits for total credit exposure and large individual credit exposures. Other material decisions that may require board approval include the introduction of new products, implementation of new links, use of new crisis-management frameworks, adoption of processes and templates for reporting significant risk exposures, and adoption of processes for considering adherence to relevant market protocols. It is critical that market governance processes fully reflect the role of the CCP in the market. The arrangements adopted by a CCP should be transparent to its participants and regulators.

76. The board and governance arrangements, generally, should support the use of clear and comprehensive rules and key procedures, including detailed and effective participant-default rules and procedures (see Principle 13). The board should have procedures in place

to support its capacity to act appropriately and immediately if any risks arise that threaten the FMI's viability as a going concern. The governance arrangements should also provide for effective decision making in a crisis and support any procedures and rules designed to facilitate the recovery or orderly wind-down of the FMI.

77. In addition, the governance of the risk management function is particularly important. It is essential that an FMI's risk management personnel have sufficient independence, authority, resources, and access to the board to ensure that the operations of the FMI are consistent with the risk management framework set by the board. The reporting lines for risk management should be clear and separate from those for other operations of the FMI, and there should be an additional direct reporting line to a non-executive director on the board via a chief risk officer (or equivalent). To help the board discharge its risk-related responsibilities, an FMI should consider the case for a risk committee, responsible for advising the board on the FMI's overall current and future risk tolerance and strategy. A CCP, however, should have such a risk committee or its equivalent. An FMI's risk committee should be chaired by a sufficiently knowledgeable individual who is independent of the FMI's executive management and be composed of a majority of members who are non-executive members. The committee should have a clear and public mandate and operating procedures and, where appropriate, have access to external expert advice.

78. Where an FMI, in accordance with applicable law, maintains a two-tier board system, the roles and responsibilities of the board and senior management will be allocated to the supervisory board and the management board, as appropriate. The reporting lines of the risk and other committees need to reflect this allocation, as well as the legal responsibilities of the management and supervisory boards. Therefore, a direct reporting line for the risk management function may involve members of the management board. In addition, the establishment of a risk committee has to take into account the legally founded responsibility of the management board for managing the risks of the FMI.

Model validation

79. The board should ensure that there is adequate governance surrounding the adoption and use of models, such as for credit, collateral and liquidity risk management systems. An FMI should validate, on an ongoing basis, the models and their methodologies used to quantify, aggregate, and manage the FMI's risks. The validation process should be independent of the development, implementation, and operation of the models and their methodologies, and the validation process should be subjected to an independent review of its adequacy and effectiveness. Validation should include: (a) an evaluation of the conceptual

soundness of (including developmental evidence supporting) the models; (b) an ongoing monitoring process that includes verification of processes and benchmarking; and (c) an analysis of outcomes that includes backtesting.

Internal controls and audit

80. The board is responsible for establishing and overseeing internal controls and audit. An FMI should have sound internal control policies and procedures to help manage its risks. For example, as part of a variety of risk controls, the board should ensure that there are adequate internal controls to protect against the misuse of confidential information. An FMI should also have an effective internal audit function, with sufficient resources and independence from management to provide, among other activities, a rigorous and independent assessment of the effectiveness of an FMI's risk management and control processes (see also Principle 3 on the framework for the comprehensive management of risks). The board will typically establish an audit committee to oversee the internal audit function. In addition to reporting to senior management, the audit function should have regular access to the board through an additional reporting line.

Stakeholder input

81. An FMI's board should consider all relevant stakeholders' interests, including those of its direct and indirect participants, in making major decisions, including those relating to the system's design, rules, and overall business strategy. An FMI with cross-border operations, in particular, should ensure that the full range of views across the jurisdictions in which it operates is appropriately considered in the decision-making process. Mechanisms for involving stakeholders in the board's decision-making process may include stakeholder representation on the board (including direct and indirect participants), user committees, and public consultation processes. As opinions among interested parties are likely to differ, the FMI should have clear processes for identifying and appropriately managing the diversity of stakeholder views and any conflicts of interest between stakeholders and the FMI. Without prejudice to local requirements on confidentiality and disclosure, the FMI should clearly and promptly inform its owners, participants, other users, and, where appropriate, the broader public, of the outcome of major decisions, and consider providing summary explanations for decisions to enhance transparency where it would not endanger candid board debate or commercial confidentiality.

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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.

82. In reviewing this principle, an assessor should consider how the various risks, both borne by and posed by the FMI, relate to and interact with each other. As such, this principle should be reviewed holistically with the other principles.

Key considerations

1. *An FMI should have risk management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk management frameworks should be subject to periodic review.*

2. *An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.*

3. *An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.*

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.*

Questions by key consideration

Key consideration 1:

Q.3.1.1: What types of risk arise in or are borne by the FMI?

Risk management policies, procedures and systems

Q.3.1.2: What are the FMI's policies, procedures and controls to help identify, measure, monitor and manage the risks that arise in or are borne by the FMI?

Q.3.1.3: What risk management systems are used by the FMI to help identify, measure, monitor and manage its range of risks?

Q.3.1.4: How do these systems provide the capacity to aggregate exposures across the FMI and, where appropriate, other relevant parties, such as the FMI's participants and their customers?

Review of risk management policies, procedures and systems

Q.3.1.5: What is the process for developing, approving and maintaining risk management policies, procedures and systems?

Q.3.1.6: How does the FMI assess the effectiveness of risk management policies, procedures and systems?

Q.3.1.7: How frequently are the risk management policies, procedures and systems reviewed and updated by the FMI? How do these reviews take into account fluctuation in risk intensity, changing environments and market practices?

Key consideration 2:

Q.3.2.1: What information does the FMI provide to its participants and, where relevant, their customers to enable them to manage and contain the risks they pose to the FMI?

Q.3.2.2: What incentives does the FMI provide for participants and, where relevant, their customers to monitor and manage the risks they pose to the FMI?

Q.3.2.3: How does the FMI design its policies and systems so that they are effective in allowing their participants and, where relevant, their customers to manage and contain their risks?

Key consideration 3:

Material risks

Q.3.3.1: How does the FMI identify the material risks that it bears from and poses to other entities as a result of interdependencies? What material risks has the FMI identified?

Q.3.3.2: How are these risks measured and monitored? How frequently does the FMI review these risks?

Risk management tools

Q.3.3.3: What risk management tools are used by the FMI to address the risks arising from interdependencies with other entities?

Q.3.3.4: How does the FMI assess the effectiveness of these risk management tools? How does the FMI review the risk management tools it uses to address these risks? How frequently is this review conducted?

Key consideration 4:

Scenarios that may prevent an FMI from providing critical operations and services

Q.3.4.1: How does the FMI identify scenarios that may potentially prevent the FMI from providing its critical operations and services? What scenarios have been identified as a result of these processes?

Q.3.4.2: How do these scenarios take into account both independent and related risks to which the FMI is exposed?

Recovery or orderly wind-down plans

Q.3.4.3: What plans does the FMI have for its recovery or orderly wind-down?

Q.3.4.4: How do the FMI's key recovery or orderly wind-down strategies enable the FMI to continue to provide critical operations and services?

Q.3.4.5: How are the plans for the FMI's recovery and orderly wind-down reviewed and updated? How frequently are the plans reviewed and updated?

Explanatory note

83. An FMI should take an integrated and comprehensive view of its risks, including the risks it bears from and poses to its participants and their customers, as well as the risks it bears from and poses to other entities, such as other FMIs, settlement banks, liquidity providers, and service providers. An FMI should consider how various risks relate to, and interact with, each other. The FMI should have a sound risk management framework (including policies, procedures, and systems) that enable it to identify, measure, monitor, and manage effectively the range of risks that arise in or are borne by the FMI. An FMI's framework should include the identification and management of interdependencies. An FMI should also provide appropriate incentives and the relevant information for its participants and other entities to manage and contain their risks vis-à-vis the FMI. As discussed in Principle 2 on governance, the board of directors plays a critical role in establishing and maintaining a sound risk management framework.

Identification of risks

84. To establish a sound risk management framework, an FMI should first identify the range of risks that arise within the FMI and the risks it directly bears from or poses to its participants, its participants' customers, and other entities. It should identify those risks that could materially affect its ability to perform or to provide services as expected. Typically these include legal, credit, liquidity, and operational risks. An FMI should also consider other relevant and material risks, such as market (or price), concentration, and general business risks, as well as risks that do not appear to be significant in isolation, but when combined with other risks become material. The consequences of these risks may have significant reputational effects on the FMI and may undermine an FMI's financial soundness as well as the stability of the broader financial markets. In identifying risks, an FMI should take a broad perspective and identify the risks that it bears from other entities, such as other FMIs, settlement banks, liquidity providers, service providers, and any entities that could be materially affected by the FMI's

inability to provide services. For example, the relationship between an SSS and an LVPS to achieve DvP settlement can create system-based interdependencies.

Comprehensive risk policies, procedures, and controls

85. An FMI's board and senior management are ultimately responsible for managing the FMI's risks (see Principle 2 on governance). The board should determine an appropriate level of aggregate risk tolerance and capacity for the FMI. The board and senior management should establish policies, procedures, and controls that are consistent with the FMI's risk tolerance and capacity. The FMI's policies, procedures, and controls serve as the basis for identifying, measuring, monitoring, and managing the FMI's risks and should cover routine and non-routine events, including the potential inability of a participant, or the FMI itself, to meet its obligations. An FMI's policies, procedures, and controls should address all relevant risks, including legal, credit, liquidity, general business, and operational risks. These policies, procedures, and controls should be part of a coherent and consistent framework that is reviewed and updated periodically and shared with the relevant authorities.

Information and control systems

86. In addition, an FMI should employ robust information and risk-control systems to provide the FMI with the capacity to obtain timely information necessary to apply risk-management policies and procedures. In particular, these systems should allow for the accurate and timely measurement and aggregation of risk exposures across the FMI, the management of individual risk exposures and the interdependencies between them, and the assessment of the impact of various economic and financial shocks that could affect the FMI. Information systems should also enable the FMI to monitor its credit and liquidity exposures, overall credit and liquidity limits, and the relationship between these exposures and limits.[27]

87. Where appropriate, an FMI should also provide its participants and its participants' customers with the relevant information to manage and contain their credit and liquidity risks. An FMI may consider it beneficial to provide its participants and its participants' customers

[27] These information systems should permit, where practicable, the provision of real time information to enable participants to manage risks. If an FMI does not provide real time information, it should provide clear, full, updated information to participants throughout the day (as frequently as possible) and consider appropriate enhancements to its systems.

with information necessary to monitor their credit and liquidity exposures, overall credit and liquidity limits, and the relationship between these exposures and limits. For example, where the FMI permits participants' customers to create exposures in the FMI that are borne by the participants, the FMI should provide participants with the capacity to limit such risks.

Incentives to manage risks

88. In establishing risk management policies, procedures, and systems, an FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI. There are several ways in which an FMI may provide incentives. For example, an FMI could apply financial penalties to participants that fail to settle securities in a timely manner or to repay intraday credit by the end of the operating day.[28] Another example is the use of loss-sharing arrangements proportionate to the exposures brought to the FMI. Such approaches can help reduce the moral hazard that may arise from formulas in which losses are shared equally among participants or other formulas where losses are not shared proportionally to risk.

Interdependencies

89. An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, or service providers) as a result of interdependencies and develop appropriate risk management tools to address these risks (see also Principle 20 on FMI links). In particular, an FMI should have effective risk-management tools to manage all relevant risks, including the legal, credit, liquidity, general business, and operational risks that it bears from and poses to other entities, in order to limit the effects of disruptions from and to such entities as well as disruptions from and to the broader financial markets. These tools should include business continuity arrangements that allow for rapid recovery and resumption of critical operations and services in the event of operational disruptions (see Principle 17 on operational risk), liquidity risk management techniques (see Principle 7 on liquidity risk), and recovery or orderly wind-down plans should

[28] If a financial penalty is imposed because of a delay in paying a debt, it is an additional amount that is to be channelled to charity on the basis of a prior commitment to do so, after deducting actual direct costs incurred by the FMI.

the FMI become non-viable.[29] Because of the interdependencies between and among systems, an FMI should ensure that its crisis-management arrangements allow for effective coordination among the affected entities, including cases in which its own viability or the viability of an interdependent entity is in question.

Recovery and orderly wind-down plans

90. 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. These scenarios should take into account the various independent and related risks to which the FMI is exposed. Using this analysis (and taking into account any constraints potentially imposed by domestic legislation), the FMI should prepare appropriate plans for its recovery or orderly wind-down. The plan should contain, among other elements, a substantive summary of the key recovery or orderly wind-down strategies, the identification of the FMI's critical operations and services, and a description of the measures needed to implement the key strategies. An FMI should have the capacity to identify and provide to related entities the information needed to implement the plan on a timely basis during stress scenarios. In addition, these plans should be reviewed and updated regularly. Where applicable, an FMI should provide relevant authorities with the information, including strategy and scenario analysis, needed for purposes of resolution planning.

Internal controls

91. An FMI also should have comprehensive internal processes to help the board and senior management monitor and assess the adequacy and effectiveness of an FMI's risk-management policies, procedures, systems, and controls. While business-line management serves as the first "line of defence," the adequacy of and adherence to control mechanisms should be assessed regularly through independent compliance programmes and independent audits.[30] A robust internal audit function can provide an independent assessment of the

[29] Although TRs are typically not exposed to financial risks from their record-keeping activities, they may be a part of a network linking various entities that could include CCPs, dealers, custodians, and service providers, and therefore should ensure that they effectively manage and minimise their own risks to reduce the potential for systemic risk to spread to such linked entities.

[30] Audits should be performed by qualified and independent individuals who did not participate in the creation of the control mechanisms. At times the FMI may find it necessary to engage a team of external auditors.

effectiveness of an FMI's risk management and control processes. An emphasis on the adequacy of controls by senior management and the board as well as internal audit can also help counterbalance a business-management culture that may favour business interests over establishing and adhering to appropriate controls. In addition, proactive engagement of audit and internal control functions when changes are under consideration can also be beneficial. Specifically, FMIs that involve their internal audit function in pre-implementation reviews will often reduce their need to expend additional resources to retrofit processes and systems with critical controls that had been overlooked during initial design phases and construction efforts.

Credit and liquidity risk management

PS	CSD	SSS	CCP	TR
●		●	●	

Principle 4: Credit risk

An FMI should effectively measure, monitor, and manage its credit exposure to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the defaultof the two largest participants and their affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions. All other CCPs should maintain, at a minimum, total financial resources sufficient to cover the default of the one participant and its affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions. In all cases, the CCP should ensure that those financial resources that may be used to support ICM transactions conform to Sharī'ah rules and principles.

92. Because of the extensive interactions between the financial risk management and financial resources principles, this principle should be reviewed in the context of Principle 5 on collateral, Principle 6 on calculation of collateral and Principle 7 on liquidity risk, as appropriate. This principle should also be reviewed in the context of Principle 13 on participant default rules and procedures, Principle 23 on disclosure of rules, key procedures and market data, and other principles, as appropriate.

Key considerations

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	●		●	●	

1. *An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement*

processes. Credit exposure may arise from current exposures, potential future exposures, or both.

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	•		•	•	

2. *An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk management tools to control these risks.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	•		•		

3. *A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent Sharī'ah-compliant financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient Sharī'ah-compliant resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
				•	

4. *A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using collateral[31] and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on calculation of collateral). In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would*

[31] The PFMI standard uses the terms "collateral" and "margin" essentially interchangeably. This reflects practice in the market, where both terms are used. This standard, however, uses the term "collateral" throughout, reflecting the fact that the term "margin" has other connotations in the relevant area of Sharīʿah scholarship. This change also results in a change to the terms "initial margin" and "variation margin", which in this standard are referred to as "initial collateral" and "variation collateral" but have the same meaning as the aforementioned conventional terms.

potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains. In all cases, the CCP should ensure that financial resources that may be used to support ICM transactions conform to Sharīʿah rules and principles.

The following key consideration applies to	PS	CSD	SSS	CCP	TR
				•	

5. *A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk management model should be performed at least annually.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
				•	

6. *In conducting stress testing, a CCP should consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and*

asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	•		•	•	

7. *An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.*

Questions by key consideration

Key consideration 1:

Q.4.1.1: What is the FMI's framework for managing credit exposures, including current and potential future exposures, to its participants and arising from its payment, clearing and settlement processes?

Q.4.1.2: How frequently is the framework reviewed to reflect the changing environment, market practices and new products?

Key consideration 2:

Q.4.2.1: How does the FMI identify sources of credit risk? What are the sources of credit risk that the FMI has identified?

Q.4.2.2: How does the FMI measure and monitor credit exposures? How frequently does and how frequently can the FMI recalculate these exposures? How timely is the information?

Q.4.2.3: What tools does the FMI use to control identified sources of credit risk (e.g. offering an RTGS or DvP settlement mechanism, limiting net debits or intraday credit, establishing concentration limits, or marking positions to

market on a daily or intraday basis)? How does the FMI measure the effectiveness of these tools?

Key consideration 3:

Coverage of exposures to each participant

Q.4.3.1: How does the payment system or SSS cover its current and, where they exist, potential future exposures to each participant? What is the composition of the FMI's financial resources used to cover these exposures? How accessible are these financial resources?

Q.4.3.2: To what extent do these financial resources cover the payment system's or SSS's current and potential future exposures fully with a high degree of confidence? How frequently does the payment system or SSS evaluate the sufficiency of these financial resources?

For DNS payment systems and DNS SSSs in which there is no settlement guarantee

Q.4.3.3: If the payment system or SSS is a DNS system in which there is no settlement guarantee, do its participants face credit exposures arising from the payment, clearing and settlement processes? If there are credit exposures in the system, how does the system monitor and measure these exposures?

Q.4.3.4: If the payment system or SSS is a DNS system in which there is no settlement guarantee and has credit exposures among its participants, to what extent does the payment system's or SSS's financial resources cover, at a minimum, the default of the two participants and their affiliates that would create the largest aggregate credit exposure in the system?

Key consideration 4:

Coverage of current and potential future exposures to each participant

Q.4.4.1: How does the CCP cover its current and potential future exposures to each participant fully with a high degree of confidence? What is the composition of

the CCP's financial resources used to cover its current and potential future exposures? How accessible are these financial resources?

Q.4.4.2: To what extent do these financial resources cover the CCP's current and potential future exposures fully with a high degree of confidence? How frequently does the CCP evaluate the sufficiency of these financial resources?

Risk profile and systemic importance in multiple jurisdictions

Q.4.4.3: Do any of the CCP's activities have a more-complex risk profile (such as clearing financial instruments that are characterised by discrete jump-to-default price changes or that are highly correlated with potential participant defaults)? Is the CCP systemically important in multiple jurisdictions?

Additional financial resources

Q.4.4.4: What additional financial resources does the CCP maintain to cover a wide range of potential stress scenarios that include, but are not limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure in extreme but plausible market conditions?

Q.4.4.5: If the CCP is involved in activities with a more-complex risk profile or is systemically important in multiple jurisdictions, to what extent do the additional financial resources cover, at a minimum, the default of the two participants and their affiliates that would create the largest credit exposure in the CCP in extreme but plausible market conditions?

Q.4.4.6: How frequently does the CCP evaluate the sufficiency of its additional resources?

Supporting rationale and governance arrangements

Q.4.4.7: How does the CCP document the supporting rationale regarding its holdings of total financial resources?

Q.4.4.8: What governance arrangements are in place relating to the amount of total financial resources at the CCP?

Q.4.4.9: What are the Sharī'ah governance arrangements in place to ensure the CCP's financial resources adhere to Sharī'ah rules and principles? (The

same question is also applicable when an SSS operates a default/guarantee fund.)

Key *consideration* 5:

Stress testing

Q.4.5.1: How does the CCP determine and stress-test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions? How frequently does the CCP stress-test its financial resources?

Q.4.5.2: How are stress test results communicated to appropriate decision-makers at the CCP? How are these results used to evaluate the adequacy of and adjust the CCP's total financial resources?

Review and validation

Q.4.5.3: How frequently does the CCP assess the effectiveness and appropriateness of stress test assumptions and parameters? How does the CCP's stress test programme take into account various conditions, such as a sudden and significant increase in position and price volatility, position concentration, change in market liquidity, and model risk including shift of parameters?

Q.4.5.4: How does the CCP validate its risk management model? How frequently does it perform this validation? Who carries this out?

Key consideration 6:

Q.4.6.1: In conducting stress testing, what scenarios does the CCP consider? What analysis supports the use of these particular scenarios? Do the scenarios include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions?

Key consideration 7:

Allocation of credit losses

Q.4.7.1: How do the FMI's rules and procedures explicitly address any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI? How do the FMI's rules and procedures address the allocation of uncovered credit losses and in what order, including the repayment of any funds an FMI may access from liquidity providers?

Replenishment of financial resources

Q.4.7.2: What are the FMI's rules and procedures on the replenishment of the financial resources that are exhausted during a stress event?

Explanatory note

93. Credit risk is broadly defined as the risk that a counterparty will be unable to meet fully its financial obligations when due or at any time in the future. The default of a participant (and its affiliates) has the potential to cause severe disruptions to an FMI, its other participants, and the financial markets more broadly.[32] Therefore, an FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes (see also Principle 3 on the framework for the comprehensive management of risks, Principle 9 on money settlements, and Principle 16 on custody and investment risks). Credit exposure may arise in the form of current exposures, potential future exposures, or both. Current exposure, in this context, is defined as the loss that an FMI (or in some cases, its participants) would face immediately if a participant were to

[32] An affiliate is defined as a company that controls, is controlled by, or is under common control with the participant. Control of a company is defined as (a) ownership, control, or holding with power to vote 20 percent or more of a class of voting securities of the company; or (b) consolidation of the company for financial reporting purposes.

default.[33] Potential future exposure is broadly defined as any potential credit exposure that an FMI could face at a future point in time.[34] The type and level of credit exposure faced by an FMI will vary based on its design and the credit risk of the counterparties concerned.[35]

Credit risk in payment systems

94. *Sources of credit risk.* A payment system may face credit risk from its participants, its payment and settlement processes, or both. This credit risk is driven mainly by current exposures from extending intraday credit to participants.[36] For example, a central bank that operates a payment system and provides intraday credit will face current exposures. A payment system can avoid carrying over current exposures to the next day by requiring its participants to refund any credit extensions before the end of the day. Intraday credit can lead to potential future exposures even when the FMI accepts collateral to secure the credit. A payment system would face potential future exposure if the value of collateral posted by a participant to cover intraday credit were to fall below the amount of credit extended to the participant by the FMI, leaving a residual exposure.

95. *Sources of credit risk in deferred net settlement systems.* A payment system that employs a DNS mechanism may face financial exposures arising from its relationship with its participants or its payment and settlement processes. A DNS payment system may explicitly guarantee settlement, whether the guarantee is provided by the FMI itself or its participants. In such systems, the guarantor of the arrangement would face current exposure if a participant were not to meet its payment or settlement obligations. Even in a DNS system that does not have an explicit guarantee, participants in the payment system may still face settlement risk vis-à-vis each other. Whether this risk involves credit exposures or liquidity exposures, or a combination of both, will depend on the type and scope of obligations, including any contingent

[33] Current exposure is technically defined as the larger of zero or the market value (or replacement cost) of a transaction or portfolio of transactions within a netting set with a counterparty that would be lost upon the default of the counterparty.

[34] Potential future exposure is technically defined as the maximum exposure estimated to occur at a future point in time at a high level of statistical confidence. Potential future exposure arises from potential fluctuations in the market value of a participant's open positions between the time they are incurred or reset to the current market price and the time they are liquidated or effectively hedged.

[35] In considering its credit exposure to a central bank, on a case-by-case basis an FMI may take into account the special characteristics of the central bank.

[36] Many payment systems do not face credit risk from their participants or payment and settlement processes, although they may face significant liquidity risk.

obligations, the participants bear. The type of obligations will, in turn, depend on factors such as the payment system's design, rules, and legal framework.

96. *Measuring and monitoring credit risk.* A payment system should frequently and regularly measure and monitor its credit risks, throughout the day using timely information. A payment system should ensure it has access to adequate information, such as appropriate collateral valuations, to allow it to measure and monitor its current exposures and degree of collateral coverage. In a DNS payment system without a settlement guarantee, the FMI should provide the capacity to its participants to measure and monitor their current exposures to each other in the system or adopt rules that require participants to provide relevant exposure information. Current exposure is relatively straightforward to measure and monitor; however, potential future exposure may require modelling or estimation. In order to monitor its risks associated with current exposure, a payment system should monitor market conditions for developments that could affect these risks, such as collateral values. In order to estimate its potential future exposure and associated risk, a payment system should model possible changes in collateral values and market conditions over an appropriate liquidation period. A payment system, where appropriate, needs to monitor the existence of large exposures to its participants and their customers. Additionally, it should monitor any changes in the creditworthiness of its participants.

97. *Mitigating and managing credit risk.* A payment system should mitigate its credit risks to the extent possible. A payment system can, for example, eliminate some of its or its participants' credit risks associated with the settlement process by employing an RTGS mechanism. In addition, a payment system should limit its current exposures by limiting intraday credit extensions and, where relevant, avoid carrying over these exposures to the next day by requiring participants to refund any credit extensions before the end of the day.[37] Such limits should balance the usefulness of credit to facilitate settlement within the system against the payment system's credit exposures.

98. In order to manage the risk from a participant default, a payment system should consider the impact of participant defaults and robust techniques for managing collateral. A

[37] A central bank often avoids using limits on a participant's credit because of its role as a monetary authority and liquidity provider.

payment system should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (equity can be used after deduction of the amount dedicated to cover general business risk) (see Principle 5 on collateral and Principle 15 on general business risk).[38] By requiring collateral to cover the credit exposures, a payment system mitigates, and in some cases eliminates, its current exposure and may provide participants with an incentive to manage credit risks they pose to the payment system or other participants. Further, this collateralisation reduces the need in a DNS payment system to unwind payments should a participant default on its obligations. Collateral or other equivalent financial resources can fluctuate in value, however, so the payment system should establish prudent haircuts to mitigate the resulting potential future exposure.

99. A DNS payment system that explicitly guarantees settlement, whether the guarantee is from the FMI itself or from its participants, should maintain sufficient financial resources to cover fully all current and potential future exposures using collateral and other equivalent financial resources. A DNS payment system in which there is no settlement guarantee, but where its participants face credit exposures arising from its payment and settlement processes, should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.[39] A higher level of coverage should be considered for a payment system that creates large exposures or that could have a significant systemic impact if more than two participants and their affiliates were to default.

Credit risk in SSSs

100. *Sources of credit risk.* An SSS may face a number of credit risks from its participants or its settlement processes. An SSS faces counterparty credit risk when it extends intraday or overnight credit to participants. This extension of credit creates current exposures and can lead to potential future exposures, even when the SSS accepts collateral to secure the credit.

[38] Equity may only be used up to the amount held in sufficiently liquid net assets. Such use of equity should be strictly limited to avoiding disruptions in settlement when collateral is not available in a timely manner.

[39] If the financial exposure faced by the DNS payment system is a liquidity exposure, then Principle 7 would apply.

An SSS would face potential future exposure if the value of collateral posted by a participant to cover this credit might fall below the amount of credit extended to the participant by the SSS, leaving a residual exposure. In addition, an SSS that explicitly guarantees settlement would face current exposures if a participant were not to fund its net debit position or meet its obligations to deliver financial instruments. Further, if an SSS does not use a DvP settlement mechanism, the SSS or its participants face principal risk, which is the risk of loss of securities or payments made to the defaulting participant prior to the detection of the default (see Principle 12 on exchange-of-value settlement systems).

101. Sources of credit risk in deferred net settlement systems. An SSS may settle securities on a gross basis and funds on a net basis (DvP model 2) or settle both securities and funds on a net basis (DvP model 3). Further, an SSS that uses a DvP model 2 or 3 settlement mechanism may explicitly guarantee settlement, whether the guarantee is by the FMI itself or by its participants. In such systems, this guarantee represents an extension of intraday credit from the guarantor. In an SSS that does not provide an explicit settlement guarantee, participants may face settlement risk vis-à-vis each other if a participant defaults on its obligations. Whether this settlement risk involves credit exposures, liquidity exposures, or a combination of both will depend on the type and scope of the obligations, including any contingent obligations, the participants bear. The type of obligations will, in turn, depend on factors such as the SSS's design, rules, and legal framework.

102. *Measuring and monitoring credit risk.* An SSS should frequently and regularly measure and monitor its credit risks throughout the day using timely information. An SSS should ensure it has access to adequate information, such as appropriate collateral valuations, to allow it to measure and monitor its current exposures and degree of collateral coverage. If credit risk exists between participants, the SSS should provide the capacity to participants to measure and monitor their current exposures to each other in the system or adopt rules that require participants to provide relevant exposure information. Current exposure should be relatively straightforward to measure and monitor; however, potential future exposure may require modelling or estimation. In order to monitor its risks associated with current exposure, an SSS should monitor market conditions for developments that could affect these risks, such as collateral values. In order to estimate its potential future exposure and associated risk, an SSS should model possible changes in collateral values and market conditions over an appropriate liquidation period. An SSS, where appropriate, needs to monitor the existence of large exposures to its participants and their customers. Additionally, it should monitor any changes in the creditworthiness of its participants.

103. *Mitigating and managing credit risk.* An SSS should mitigate its credit risks to the extent possible. An SSS should, for example, eliminate its or its participants' principal risk associated with the settlement process by employing an exchange-of-value settlement system (see Principle 12 on exchange-of-value settlement systems). The use of a system that settles securities and funds on a gross, obligation-by-obligation basis (DvP model 1) would further reduce credit and liquidity exposures among participants and between participants and the SSS. In addition, an SSS should limit its current exposures by limiting intraday credit extensions and, where relevant, overnight credit extensions.[40] Such limits should balance the usefulness of credit to facilitate settlement within the system against the SSS's credit exposures.

104. In order to manage the risk from a participant default, an SSS should consider the impact of participant defaults and use robust techniques for managing collateral. An SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (equity can be used after deduction of the amount dedicated to cover general business risk) (see Principle 5 on collateral and Principle 15 on general business risk).[41] By requiring collateral to cover the credit exposures, an SSS mitigates, and in some cases eliminates, its current exposures and may provide participants with an incentive to manage the credit risks they pose to the SSS or other participants. Further, this collateralisation allows an SSS that employs a DvP model 2 or 3 mechanism to avoid unwinding transactions or to mitigate the effect of an unwind should a participant default on its obligations. Collateral and other equivalent financial resources can fluctuate in value, however, so the SSS needs to establish prudent haircuts to mitigate the resulting potential future exposures.

105. An SSS that uses a DvP model 2 or 3 mechanism and explicitly guarantees settlement, whether the guarantee is from the FMI itself or from its participants, should maintain sufficient financial resources to cover fully, with a high degree of confidence, all current and potential future exposures using collateral and other equivalent financial resources. An SSS that uses a DvP model 2 or 3 mechanism and does not explicitly guarantee

[40] A central bank often avoids using limits on a participant's credit because of its role as a monetary authority and liquidity provider.

[41] Equity may only be used up to the amount held in sufficiently liquid net assets. Such use of equity should be strictly limited to avoiding disruptions in settlement when collateral is not available in a timely manner.

settlement, but where its participants face credit exposures arising from its payment, clearing, and settlement processes, should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.[42] A higher level of coverage should be considered for an SSS that has large exposures or that could have a significant systemic impact if more than two participants and their affiliates were to default.

Credit risk in CCPs

106. *Sources of credit risk.* A CCP typically faces both current and potential future exposures because it typically holds open positions with its participants. Current exposure arises from fluctuations in the market value of open positions between the CCP and its participants.[43] Potential future exposure arises from potential fluctuations in the market value of a defaulting participant's open positions until the positions are closed out, fully hedged, or transferred by the CCP following an event of default.[44] For example, during the period in which a CCP neutralises or closes out a position following the default of a participant, the market value of the position or asset being cleared may change, which could increase the CCP's credit exposure, potentially significantly.[45] A CCP can also face potential future exposure due to the potential for collateral (initial collateral) to decline significantly in value over the close-out period.

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[42] If the financial exposure faced by the DNS SSS is a liquidity exposure, then Principle 7 would apply.

[43] For example, for a CCP that pays and collects variation collateral (after marking positions to market and then, upon completion of the variation cycle, resetting the value of positions to zero daily), the current exposure is the difference between the current (i.e. at the moment) value of open positions and the value of the positions when the CCP last marked them to market for the purpose of collecting variation collateral.

[44] For positions that are marked to market and settled daily, potential future exposure is typically related to the interval between the last daily mark-to-market and the point the position is closed out. That is, potential future exposure includes uncovered current exposure stemming from the price development from the last mark-to-market to the time of close out, full hedging, or transfer.

[45] A CCP may close out a defaulting participant's positions by entering the market to buy or sell contracts identical but opposite to the net positions held by the defaulting participant at current market prices (see Principle 13 on participant-default rules and procedures). (The CCP may alternatively auction the defaulting participant's positions to other participants, whether in whole or in part.) During the liquidation period, market prices on the open positions can change, exposing the CCP to additional liquidation costs until the point of close out. To mitigate this risk, a CCP may also temporarily hedge the defaulter's positions by entering into positions with values that are negatively correlated with the values of the positions held by the defaulting participant. The CCP's liquidation cost therefore not only includes the uncovered current exposure that would exist at the time of default but also the potential future exposure associated with relevant changes in market prices during the liquidation period.

107. *Measuring and monitoring credit risk.* A CCP should frequently and regularly measure and monitor its credit risks throughout the day using timely information. A CCP should ensure that it has access to adequate information to allow it to measure and monitor its current and potential future exposures. Current exposure is relatively straightforward to measure and monitor when relevant market prices are readily available. Potential future exposure is typically more challenging to measure and monitor and usually requires modelling and estimation of possible future market price developments and other variables and conditions, as well as specifying an appropriate time horizon for the close out of defaulted positions. In order to estimate the potential future exposures that could result from participant defaults, a CCP should identify risk factors and monitor potential market developments and conditions that could affect the size and likelihood of its losses in the close out of a defaulting participant's positions. A CCP should monitor the existence of large exposures to its participants and, where appropriate, their customers. Additionally, it should monitor any changes in the creditworthiness of its participants.

108. *Mitigating and managing credit risk.* A CCP should mitigate its credit risk to the extent possible. For example, to control the build-up of current exposures, a CCP should require that open positions be marked to market and that each participant pay funds, typically in the form of variation collateral, to cover any loss in its positions' net value at least daily; such a requirement limits the accumulation of current exposures and therefore mitigates potential future exposures. In addition, a CCP should have the authority and operational capacity to make intraday collateral calls, both scheduled and unscheduled, from participants. Further, a CCP may choose to place limits on credit exposures in some cases, even if collateralised. Limits on concentrations of positions or additional collateral requirements may also be warranted.

109. A CCP typically uses a sequence of prefunded financial resources, often referred to as a "waterfall", to manage its losses caused by participant defaults. The waterfall may include a defaulter's initial collateral, the defaulter's contribution to a prefunded default arrangement, a specified portion of the CCP's own funds, and other participants' contributions to a prefunded default arrangement.[46] Initial collateral is used to cover a CCP's potential future exposures, as

[46] Prefunded default arrangements for loss mutualisation and other pooling-of-resources arrangements involve trade-offs that a CCP should carefully assess and balance. For example, a CCP may be able to protect itself against

well as current exposures not covered by variation collateral, to each participant with a high degree of confidence.[47] However, a CCP generally remains exposed to residual risk (or tail risk) if a participant defaults and market conditions concurrently change more drastically than is anticipated in the collateral calculations. In such scenarios, a CCP's losses may exceed the defaulting participant's posted collateral. Although it is not feasible to cover all such tail risks given the unknown scope of potential losses due to price changes, a CCP should maintain additional financial resources, such as additional collateral or a prefunded default arrangement, to cover a portion of the tail risk.

110. The structure of the prefunded financial resources should comply with Sharī'ah rules and principles as approved by the Sharī'ah board. The contributions by the participants to such resources could be either in cash or in kind, but if the latter, in addition to ensuring it complies with Sharī'ah rules and principles, a CCP should apply a prudent haircut to the value of the asset. Additionally, a CCP should ensure such prefunded resources are invested in a Sharī'ah-compliant manner at all times. A CCP should also document and disclose the treatment of income generated from such investment to the participants and relevant authorities.

111. Because the CCP is a party to every transaction, and must settle the buy leg even if the sell leg fails,[48] or vice versa, failure by any party to settle creates an unfulfilled obligation between it and the CCP. The resources it has contributed to the CCP are thus the first resources to be called upon to settle that obligation. In general, failure to settle will be resolved by allowing additional time, generally with a penalty fee[49] to be channelled to charity on the basis of a prior commitment to do so in the case of late payment. However, should a participant be declared to be in default, then all its outstanding positions will be closed out. As already indicated, any losses to the CCP in doing so will be met first from the resources provided by

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defaults in extreme conditions more efficiently using pooled resources, as the costs are shared among participants. The lower cost provides an incentive to increase the available financial resources so that the CCP is more financially secure. The pooling of resources, however, also increases the interdependencies among participants. The proportion of assets used to absorb a default that is pooled across participants versus the proportion that is segregated, such as collaterals, should balance the safety and soundness of the CCP against the increased interdependencies among participants in order to minimise systemic risk.

[47] Other resources may be used in place of initial collateral; however, these resources should be prefunded and of equivalent or stronger quality in comparison to prudently designed collateral arrangements.

[48] Acquiring securities in the market if necessary.

[49] The penalty fee is to be distributed to charity after deducting actual expenses incurred by the CCP.

that participant and second by the CCP itself up to a limit normally set by regulators. Only if these prove insufficient will resources provided by other participants be used, or more extreme measures be taken, such as the possibility of calling additional contributions.

112. In relation to a default arrangement prefunded by participants, having adequate resources in such a fund or replenishing it after it is being used is time sensitive. Therefore, for the purpose of managing risk and ensuring resilience in FMIs, and depending on the structure, a CCP may impose a late payment fee on participants should they fail to honour their contributions within the specific time requirement.

113. Where a fee is charged, either for late payment or for failure to settle on time, it may be used to defray actual costs incurred by the CCP (not including opportunity loss and cost of funds) – for example, in purchasing securities in the market to settle a transaction. Any excess must be channelled to charity as approved by the Sharīʿah board advising the FMI.

114. A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using collateral and other prefunded financial resources. As discussed more fully in Principle 6 on calculation of collateral, a CCP should establish initial collateral requirements that are commensurate with the risks of each product and portfolio. Initial collateral should meet an established single-tailed confidence level of at least 99 percent of the estimated distribution of future exposure.[50] For a CCP that calculates collateral at the portfolio level, this standard applies to the distribution of future exposure of each portfolio. For a CCP that calculates collateral at more-granular levels, such as at the subportfolio level or product level, the standard must be met for the corresponding distributions of future exposure.

115. In addition to fully covering its current and potential future exposures, a CCP should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios involving extreme but plausible market conditions. Specifically, a CCP that is involved in activities with a more-complex risk profile (such as clearing financial instruments that are characterised by discrete jump-to-default price changes or that are highly correlated with potential participant defaults) or that is systemically important in multiple jurisdictions, should maintain additional financial resources sufficient to cover a wide range of potential

[50] This concept parallels the technical definition of potential future exposure as a risk measure. See footnote 34.

stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. Determinations of whether a CCP is systemically important in multiple jurisdictions should include consideration of, among other factors, (a) the location of the CCP's participants, (b) the aggregate volume and value of transactions that originate in each jurisdiction in which it operates, (c) the proportion of its total volume and value of transactions that originate in each jurisdiction in which it operates, (d) the range of currencies in which the instruments it clears are cleared or settled, (e) any links it has with FMIs located in other jurisdictions, and (f) the extent to which it clears instruments that are subject to mandatory clearing obligations in multiple jurisdictions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to (see Principle 2 on governance), the amount of total financial resources it maintains.

Testing the sufficiency of a CCP's total financial resources

116. A CCP should determine the amount and regularly test the sufficiency of its total financial resources through stress testing. A CCP should also conduct reverse stress tests, as appropriate, to test how severe stress conditions would be covered by its total financial resources. Because initial collateral is a key component of a CCP's total financial resources, a CCP should also test the adequacy of its initial collateral requirements and model through backtesting and sensitivity analysis, respectively (see Principle 6 for further discussion on testing of the initial collateral requirements and model).

117. *Stress testing.* A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress-testing scenarios, models, and underlying parameters and

assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk management model should be performed at least annually.[51]

118. In conducting stress testing, a CCP should consider a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods.[52] Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Extreme but plausible conditions should not be considered a fixed set of conditions, but rather, conditions that evolve. Stress tests should quickly incorporate emerging risks and changes in market assumptions (e.g. departures from usual patterns of co-movements in prices among the products a CCP clears).[53] A CCP proposing to clear new products should consider movements in prices of any relevant related products.

119. *Reverse stress tests.* A CCP should conduct, as appropriate, reverse stress tests aimed at identifying the extreme scenarios and market conditions in which its total financial resources would not provide sufficient coverage of tail risk. Reverse stress tests require a CCP to model hypothetical positions and extreme market conditions that may go beyond what are considered extreme but plausible market conditions in order to help understand collateral

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[51] Although a CCP may use the results of stress testing to assess the validity of the stress scenarios, models, and underlying parameters and assumptions, these aspects should not be arbitrarily adjusted to control the adequacy of total financial resources. Stress scenarios, models, and underlying parameters and assumptions should be examined based on historical data of prices of cleared products and participants' positions and potential developments of these factors under extreme but plausible market conditions in the markets that the CCP serves. See paragraph 118.

[52] The risk management methods of some CCPs may integrate the management of risk from participant positions with risks from price developments. If this integrated risk management approach is well implemented, stress scenarios can take into account appropriate combinations in defaulting positions and price changes.

[53] Dependence among exposures as well as between participants and exposures should be considered. If an FMI calculates exposures on a portfolio basis, then the dependence of the instruments within participants' portfolios needs to be stressed.

calculations and the sufficiency of financial resources given the underlying assumptions modelled. Modelling extreme market conditions can help a CCP determine the limits of its current model and resources; however, it requires the CCP to exercise judgment when modelling different markets and products. A CCP should develop hypothetical extreme scenarios and market conditions tailored to the specific risks of the markets and of the products it serves. Reverse stress testing should be considered a helpful management tool but need not, necessarily, drive the CCP's determination of the appropriate level of financial resources.

Use of financial resources

120. The rules of an FMI should expressly set out the waterfall, including the circumstances in which specific resources of the FMI can be used in a participant default (see Principle 13 on participant-default rules and procedures and Principle 23 on disclosure of rules, key procedures, and market data). For the purposes of this principle, an FMI should not include as "available" to cover credit losses from participant defaults those resources that are needed to cover current operating expenses, potential general business losses, or other losses from other activities in which the FMI is engaged (see Principle 15 on general business risk). In addition, if an FMI serves multiple markets (either in the same jurisdiction or multiple jurisdictions), its ability to use resources supplied by participants in one market to cover losses from a participant default in another market should have a sound legal basis, be clear to all participants, and avoid significant levels of contagion risk between markets and participants. The design of an FMI's stress tests should take into account the extent to which resources are pooled across markets in scenarios involving one or more participant defaults across several markets.

Contingency planning for uncovered credit losses

121. In certain extreme circumstances, the post-liquidation value of the collateral and other financial resources that secure an FMI's credit exposures may not be sufficient to cover credit losses resulting from those exposures fully. An FMI should analyse and plan for how it would address any uncovered credit losses. An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated,

including the repayment of any funds an FMI may borrow from liquidity providers.[54] An FMI's rules and procedures should also indicate its process to replenish any financial resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.

[54] For instance, an FMI's rules and procedures might provide the possibility to allocate uncovered credit losses by writing down potentially unrealised gains by non-defaulting participants and the possibility of calling for additional contributions from participants based on the relative size and risk of their portfolios.

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Principle 5: Collateral

An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks, and where applicable, Sharīʻah-compliant. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.

122. Because of the extensive interactions between the financial risk management and financial resources principles, this principle should be reviewed in the context of Principle 4 on credit risk, Principle 6 on calculation of collateral and Principle 7 on liquidity risk, as appropriate. This principle should also be reviewed in the context of Principle 14 on segregation and portability, Principle 16 on custody and investment risk, and other principles, as appropriate.

Key considerations

1. *An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks, and that are Sharīʻah-compliant.*

2. *An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.*

3. *In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.*

4. *An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.*

5. *An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.*

6. *An FMI should use a collateral management system that is well-designed and operationally flexible.*

Questions by key consideration

Key consideration 1:

Q.5.1.1: How does the FMI determine whether a specific asset can be accepted as collateral, including collateral that will be accepted on an exceptional basis? How does the FMI determine what qualifies as an exceptional basis? How frequently does the FMI adjust these determinations? How frequently does the FMI accept collateral on an exceptional basis, and does it place limits on its acceptance of such collateral?

Q.5.1.2: How does the FMI monitor the collateral that is posted so that the collateral meets the applicable acceptance criteria?

Q.5.1.3: How does the FMI identify and mitigate possible specific wrong-way risk – for example, by limiting the collateral it accepts (including collateral concentration limits)?

Key consideration 2:

Valuation practices

Q.5.2.1: How frequently does the FMI mark its collateral to market, and does it do so at least daily?

Q.5.2.2: To what extent is the FMI authorised to exercise discretion in valuing assets when market prices do not represent their true value?

Haircutting practices

Q.5.2.3: How does the FMI determine haircuts?

Q.5.2.4: How does the FMI test the sufficiency of haircuts and validate its haircut procedures, including with respect to the potential decline in the assets' value in stressed market conditions involving the liquidation of collateral? How frequently does the FMI complete this test?

Key consideration 3:

Q.5.3.1: How does the FMI identify and evaluate the potential procyclicality of its haircut calibrations? How does the FMI consider reducing the need for procyclical adjustments – for example, by incorporating periods of stressed market conditions during the calibration of haircuts?

Key consideration 4:

Q.5.4.1: What are the FMI's policies for identifying and avoiding concentrated holdings of certain assets in order to limit potential adverse price effects at liquidation? What factors (e.g. adverse price effects or market conditions) are considered when determining these policies?

Q.5.4.2: How does the FMI review and evaluate concentration policies and practices to determine their adequacy? How frequently does the FMI review and evaluate these policies and practices?

Key consideration 5:

Q.5.5.1: What are the legal, operational, market, Sharī'ah non-compliance and other risks that the FMI faces by accepting cross-border collateral? How does the FMI mitigate these risks?

Q.5.5.2: How does the FMI ensure that cross-border collateral can be used in a timely manner?

Key consideration 6:

Collateral management system design

Q.5.6.1: What are the primary features of the FMI's collateral management system?

Q.5.6.2: How and to what extent does the FMI track the use of collateral and its rights to the collateral provided?

Operational flexibility

Q.5.6.3: How and to what extent does the FMI's collateral management system accommodate changes in the ongoing monitoring and management of collateral?

Q.5.6.4: To what extent is the collateral management system staffed to ensure smooth operations even during times of market stress?

Explanatory note

123. Collateralising credit exposures protects an FMI and, where relevant, its participants against potential losses in the event of a participant default (see Principle 4 on credit risk). Besides mitigating an FMI's own credit risk, the use of collateral can provide participants with incentives to manage the risks they pose to the FMI or other participants. An FMI should apply prudent haircuts to the value of the collateral to achieve a high degree of confidence that the liquidation value of the collateral will be greater than or equal to the obligation that the collateral secures in extreme but plausible market conditions.[55] Additionally, an FMI should have the capacity to use the collateral promptly when needed.

Acceptable collateral

124. An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks, and where applicable, that are Sharī'ah-compliant.[56] In the normal course of business, an FMI may be exposed to risk from certain types of collateral that are not considered to have low credit, liquidity, and market risks. However, in some instances, these assets may be acceptable collateral for credit purposes if an

[55] The risk management methods of some FMIs may integrate the management of risk from participant positions with the risk from fluctuations in the value of collateral provided by participants.

[56] An FMI, where applicable, should limit its acceptable collaterals to those that are Sharī'ah-compliant as determined by a Sharī'ah board. IFSB Working Paper Series (WP-01): *Strengthening the Financial Safety Net: The Role of Sharī`ah-Compliant Lender-of-Last-Resort (SLOLR) Facilities as an Emergency Financing Mechanism* cites several examples of collateral acceptable in Sharī'ah.

appropriate haircut is applied. An FMI must be confident of the collateral's value in the event of liquidation and of its capacity to use that collateral quickly, especially in stressed market conditions. An FMI that accepts collateral with credit, liquidity, and market risks above minimum levels should demonstrate that it sets and enforces appropriately conservative haircuts and concentration limits.[57]

125. In an instance where a collateral changes its status from Sharī'ah-compliant to non-Sharī'ah-compliant during the holding period by an FMI, the FMI should seek a replacement from the participant, where applicable.

126. To ensure the operation of the market is not disrupted during a highly volatile market environment arising from a crisis, an FMI may consider accepting broader forms of collaterals and imposing a lenient approach towards haircuts on any collateral accepted, while being mindful of the risk associated with such arrangement.

127. Further, an FMI should regularly adjust its requirements for acceptable collateral in accordance with changes in underlying risks. When evaluating types of collateral, an FMI should consider potential delays in accessing the collateral due to the settlement conventions for transfers of the asset. In addition, participants should not be allowed to post their own securities, or securities of companies closely linked to them, as collateral. More generally, an FMI should mitigate specific wrong-way risk by limiting the acceptance of collateral that would likely lose value in the event that the participant providing the collateral defaults.[58] The FMI should measure and monitor the correlation between a counterparty's creditworthiness and the collateral posted and take measures to mitigate the risks – for instance, by setting more-conservative haircuts.

128. If an FMI plans to use assets held as collateral to secure liquidity facilities in the event of a participant default, the FMI will also need to consider, in determining acceptable collateral, what will be acceptable as security to lenders offering liquidity facilities (see Principle 7).

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[57] In general, guarantees are not acceptable collateral. However, in rare circumstances and subject to regulatory approval, a guarantee fully backed by collateral that is realisable on a same-day basis may serve as acceptable collateral. An explicit guarantee from the relevant central bank of issue would constitute acceptable collateral providing it is supported by the legal framework applicable to and the policies of the central bank.

[58] Specific wrong-way risk is defined as the risk that an exposure to a counterparty is highly likely to increase when the creditworthiness of that counterparty is deteriorating.

Valuing collateral

129. To have adequate assurance of the collateral's value in the event of liquidation, an FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions. An FMI should, at a minimum, mark its collateral to market daily. Haircuts should reflect the potential for asset values and liquidity to decline over the interval between their last revaluation and the time by which an FMI can reasonably assume that the assets can be liquidated. Haircuts also should incorporate assumptions about collateral value during stressed market conditions and reflect regular stress testing that takes into account extreme price moves, as well as changes in market liquidity for the asset. If market prices do not fairly represent the true value of the assets, an FMI should have the authority to exercise discretion in valuing assets according to predefined and transparent methods. An FMI's haircut procedures should be independently validated at least annually.[59]

Limiting procyclicality

130. An FMI should appropriately address procyclicality in its collateral arrangements. To the extent practicable and prudent, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions in order to reduce the need for procyclical adjustments. In this context, procyclicality typically refers to changes in risk management practices that are positively correlated with market, business, or credit cycle fluctuations and that may cause or exacerbate financial instability. While changes in collateral values tend to be procyclical, collateral arrangements can increase procyclicality if haircut levels fall during periods of low market stress and increase during periods of high market stress. For example, in a stressed market, an FMI may require the posting of additional collateral both because of the decline of asset prices and because of an increase in haircut levels. Such actions could exacerbate market stress and contribute to driving down asset prices further, resulting in additional collateral requirements. This cycle could exert further downward pressure on asset prices. Addressing issues of procyclicality may create additional costs for FMIs and their participants in periods of low market stress because of higher

[59] Validation of the FMI's haircut procedures should be performed by personnel of sufficient expertise who are independent of the personnel that created and applied the haircut procedures. These expert personnel could be drawn from within the FMI. However, a review by personnel external to the FMI may also be necessary at times.

collateral requirements, but result in additional protection and potentially less-costly and less-disruptive adjustments in periods of high market stress.

Avoiding concentrations of collateral

131. An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects. High concentrations within holdings can be avoided by establishing concentration limits or imposing concentration charges. Concentration limits restrict participants' ability to provide certain collateral assets above a specified threshold as established by the FMI. Concentration charges penalise participants for maintaining holdings of certain assets beyond a specified threshold as established by the FMI. Further, concentration limits and charges should be constructed to prevent participants from covering a large share of their collateral requirements with the most risky assets acceptable. Concentration limits and charges should be periodically reviewed by the FMI to determine their adequacy.

Cross-border collateral

132. If an FMI accepts cross-border (or foreign) collateral, it should identify and mitigate any additional risks associated with its use and ensure that it can be used in a timely manner.[60] A cross-border collateral arrangement can provide an efficient liquidity bridge across markets, help relax collateral constraints for some participants, and contribute to the efficiency of some asset markets. These linkages, however, can also create significant interdependencies and risks to FMIs that need to be evaluated and managed by the affected FMIs (see also Principle 17 on operational risk and Principle 20 on FMI links). For example, an FMI should have appropriate legal and operational safeguards to ensure that it can use the cross-border collateral in a timely manner and should identify and address any significant liquidity effects. An FMI also should consider foreign-exchange risk where collateral is denominated in a currency different from that in which the exposure arises, and set haircuts to address the additional risk to a high level of confidence. An FMI should also be mindful of Sharī'ah risk that may arise from cross-collateral activity whereby the collateral transferred from one FMI to another (to satisfy collateral requirements) may not comply with Sharī'ah rules and principles.

[60] Cross-border collateral has at least one of the following foreign attributes: (a) the currency of denomination, (b) the jurisdiction in which the assets are located, or (c) the jurisdiction in which the issuer is established.

The FMI should have the capacity to address potential operational challenges of operating across borders, such as differences in time zones or operating hours of foreign CSDs or custodians.

Collateral management systems

133. An FMI should use a well-designed and operationally flexible collateral management system. Such a system should accommodate changes in the ongoing monitoring and management of collateral. Where appropriate, the system should allow for the timely calculation and execution of collateral calls, the management of collateral call disputes, and the accurate daily reporting of levels of initial and variation collateral. Further, a collateral management system should track the extent of use of collateral (both cash and non-cash) and the rights of an FMI to the collateral provided to it by its counterparties. An FMI's collateral management system should also have functionality to accommodate the timely deposit, withdrawal, substitution, and liquidation of collateral. An FMI should allocate sufficient resources to its collateral management system to ensure an appropriate level of operational performance, efficiency, and effectiveness. Senior management should ensure that the FMI's collateral management function is adequately staffed to ensure smooth operations, especially during times of market stress, and that all activities are tracked and reported, as appropriate, to senior management.[61]

Use of collateral

134. The Sharīʿah ruling is that collateral remains in the ownership of the pledgor. Use of collateral refers to the FMI's subsequent use of collateral that has been provided by participants in the normal course of business. This differs from the FMI's use of collateral in a default scenario during which the defaulter's collateral, can be used to access liquidity facilities or can be liquidated to cover losses (see Principle 13 on participant-default rules and procedures). An FMI should have clear and transparent rules regarding the use of collateral (see Principle 23 on disclosure of rules, key procedures, and market data). In particular, the rules should clearly specify when an FMI may use its participant collateral and the duration of

[61] Information included in summary reports should incorporate information on the use of collateral and the terms of such use, including instrument, credit quality, and maturity. These reports should also track concentration of individual collateral asset classes.

that use, and the treatment of the profit thereof according to the contract used in the investment in adherence to Sharīʿah rules and principles (see Principle 16 on custody and investment risks).

135. The FMI must seek consent from the participant to any use of the collateral for investment purposes. Further, the FMI should document and disclose how returns generated from such collateral will be treated in accordance with Sharīʿah rules and principles.

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Principle 6: Calculation of collateral

A CCP should cover its credit exposures to its participants for all products through an effective Sharīʿah-compliant collateral system that is risk-based and regularly reviewed.

136. Because of the extensive interactions between the financial risk management and financial resources principles, this principle should be reviewed in the context of Principle 4 on credit risk, Principle 5 on collateral and Principle 7 on liquidity risk, as appropriate. This principle should also be reviewed in the context of Principle 8 on settlement finality, Principle 17 on operational risk, and other principles, as appropriate.

Key considerations

1. *A CCP should have a Sharīʿah-compliant collateral system that establishes collateral levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.*

2. *A CCP should have a reliable source of timely price data for its collateral system. A CCP should also have procedures and sound valuation models for addressing circumstances in which pricing data are not readily available or reliable.*

3. *A CCP should adopt initial collateral models and parameters that are risk-based and generate collateral requirements sufficient to cover its potential future exposure to participants in the interval between the last collateral collection and the close out of positions following a participant default. Initial collateral should meet an established single-tailed confidence level of at least 99 percent with respect to the estimated distribution of future exposure. For a CCP that calculates collateral at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a CCP that calculates collateral at more-granular levels, such as at the subportfolio level or by product, the requirement must be met for the corresponding distributions of future exposure. The model should (a) use a conservative estimate of the time horizons for the effective hedging or close out of the particular types of products cleared by the CCP (including in stressed market conditions), (b) have an appropriate method for measuring credit exposure that accounts for relevant product risk factors*

and portfolio effects across products, and (c) to the extent practicable and prudent, limit the need for destabilising, procyclical changes.

4. *A CCP should mark participant positions to market and collect variation collateral at least daily to limit the build-up of current exposures. A CCP should have the authority and operational capacity to make intraday collateral calls and payments, both scheduled and unscheduled, to participants.*

5. *In calculating collateral requirements, a CCP may allow offsets or reductions in required collateral across products that it clears or between products that it and another CCP clear, if the risk of one product is significantly and reliably correlated with the risk of the other product. Where two or more CCPs are authorised to offer cross-collateral, they must have appropriate safeguards and harmonised overall risk management systems.*

6. *A CCP should analyse and monitor its model performance and overall collateral coverage by conducting rigorous daily backtesting and at least monthly, and more-frequent where appropriate, sensitivity analysis. A CCP should regularly conduct an assessment of the theoretical and empirical properties of its collateral model for all products it clears. In conducting sensitivity analysis of the model's coverage, a CCP should take into account a wide range of parameters and assumptions that reflect possible market conditions, including the most-volatile periods that have been experienced by the markets it serves and extreme changes in the correlations between prices.*

7. *A CCP should regularly review and validate its collateral system.*

Questions by key consideration

Key consideration 1:

Description of collateral methodology

Q.6.1.1: What is the general framework of the CCP's collateral system, particularly with respect to current and potential future exposures? If the CCP does not

use a collateral system, what risk management measures does it take to mitigate its risks? To what extent do these measures deliver equivalent outcomes?

Q.6.1.2: Is the collateral methodology documented?

Q.6.1.3: To what extent is the detail of the CCP's collateral methodology made available to participants for use in their individual risk management efforts?

Credit exposures

Q.6.1.4: What are the determinants of the credit exposures of the CCP, with respect to the attributes of each product, portfolio and market it serves?

Q.6.1.5: To what extent are the CCP's collateral requirements commensurate with the risks and particular attributes of each product, portfolio and market it serves?

Operational components

Q.6.1.6: How does the CCP address the risk of a participant payment failure that would cause a shortage of required collateral to the participant's position?

Q.6.1.7: How does the CCP enforce timelines for collateral collections and payments? If the CCP has participants from different time zones, how does the CCP address issues posed by differences in local funding markets and operating hours of relevant payment and settlement systems?

Key consideration 2:

Sources of price data

Q.6.2.1: What are the sources of price data for the CCP's collateral model? What data does the CCP use to determine initial collateral?

Q.6.2.2: How does the CCP determine that the price data it uses for its collateral system is timely and reliable, including prices provided by a third party where relevant?

Estimation of prices

Q.6.2.3: When prices are not readily available or reliable, how does the CCP estimate prices to calculate collateral requirements?

Q.6.2.4: How does the CCP validate models used to estimate prices or collateral requirements when price data are not readily available or reliable? How does the FMI ensure the independence of the validation process?

Key consideration 3:

Initial collateral model

Q.6.3.1: What is the design of the CCP's initial collateral model? Describe the model in detail, including the method used to determine potential future exposure. What is the level of coverage of the initial collateral model?

Q.6.3.2: What are the assumptions of the collateral model?

Q.6.3.3: How does the CCP estimate the key parameters and inputs of the collateral model (such as the liquidation horizon and confidence interval)?

Closeout and sample periods

Q.6.3.4: How does the CCP determine an appropriate closeout period for each product? In particular, how does the CCP account for potentially increased liquidation times during stressed market conditions? What factors are considered in this analysis (e.g. market liquidity, impact of a participant's default on prevailing market conditions, adverse effects of position concentration, and the CCP's hedging capability)?

Q.6.3.5: How does the CCP determine an appropriate sample period for historical data used in the collateral model? What factors are considered (e.g. reflection of new, current or past volatilities, or use of simulated data for new products without much history)?

Q.6.3.6: How does the CCP consider the trade-off between prompt liquidation and adverse price effects?

Procyclicality and specific wrong-way risk

Q.6.3.7: How does the CCP address procyclicality in the collateral methodology? In particular, does the CCP adopt collateral requirements that, to the extent practical and prudent, limit the need for destabilising procyclical changes?

Q.6.3.8: How does the CCP identify and mitigate specific wrong-way risk?

Key consideration 4:

Q.6.4.1: What is the design of the CCP's variation collateral model? Describe the model in detail, including the method used to measure current exposure, frequency of mark-to-market and schedule of collateral collection, and intraday collateral call capabilities.

Q.6.4.2: Does the CCP have the authority and operational capacity to make and complete intraday collateral calls for initial and variation collateral?

Key consideration 5:

Portfolio collateral

Q.6.5.1: Does the CCP allow offsets or reductions in required collateral across products that it clears or between products that it or another CCP clear? If so, is the risk of one product significantly and reliably correlated with the risk of the other product? How does the CCP offset or reduce required collateral?

Q.6.5.2: How does the CCP identify and measure its potential future exposure at the product and portfolio level? How does the CCP's portfolio collateral methodology account for offsets or reductions in required collateral across products that it clears?

Cross-collateral

Q.6.5.3: In the case of cross-collateral between two or more CCPs, how have the CCPs harmonised their approaches to risk management? What legal and operational arrangements govern the cross-collateral arrangements?

Robustness of methodologies

Q.6.5.4: How does the CCP confirm the robustness of its portfolio and cross-collateral methodologies? How does the CCP's methodology account for the degree of price dependency, and its stability in stressed market conditions?

Key consideration 6:

Backtesting and sensitivity analysis

Q.6.6.1: Describe in detail the backtesting methodologies and model performance, including both target confidence level and the result of overall collateral coverage. How does such testing address portfolio effects within and across asset classes within the CCP and cross-collateral programmes with other CCPs? How frequently is the backtesting conducted?

Q.6.6.2: Describe in detail the sensitivity analysis of model performance and overall coverage of the CCP's initial collateral methodology. Does the analysis cover a wide range of parameters, assumptions, historical and hypothetical market conditions, and participant positions, including stressed conditions? How frequently is the analysis conducted?

Collateral model performance

Q.6.6.3: What are the identified potential shortcomings of the collateral model based on backtesting and sensitivity analysis?

Q.6.6.4: What actions would the CCP take if the model did not perform as expected?

Q.6.6.5: How does the CCP disclose the results of its backtesting and sensitivity analysis?

Key consideration 7:

Q.6.7.1: How does the CCP regularly review and validate its collateral system including its theoretical and empirical properties? How frequently is this done?

Q.6.7.2: How does the CCP incorporate material revisions and adjustments of the collateral methodology, including parameters, into its governance arrangements?

Q.6.7.3: How and to whom does the CCP disclose both the method and the results of this review and validation?

Explanatory note

137. An effective Sharīʻah-compliant collateral system[62] is a key risk management tool for a CCP to manage the credit exposures posed by its participants' open positions (see also Principle 4 on credit risk). A CCP should collect collateral, which is a deposit of collateral in the form of money, securities, or other financial instruments that are Sharīʻah-compliant, to assure performance and to mitigate its credit exposures for all products that it clears if a participant defaults (see also Principle 5 on collateral). Collateral systems typically differentiate between initial collateral and variation collateral.[63] Initial collateral is typically collected to cover potential changes in the value of each participant's position (i.e. potential future exposure) over the appropriate close-out period in the event the participant defaults. Calculating potential future exposure requires modelling potential price movements and other relevant factors, as well as specifying the target degree of confidence and length of the close-out period. Variation collateral is collected and paid out to reflect current exposures resulting from actual changes in market prices. To calculate variation collateral, open positions are marked to current market prices and funds are typically collected from (or paid to) a counterparty to settle any losses (or gains) on those positions.

138. Where a CCP operates a dual system, it should ensure separation between the Sharīʿah-compliant and any non-compliant collateral system that it also operates. This is to

[62] Where a CCP establishes a collateral system or its equivalent, it should adhere to Sharīʻah rules and requirements as approved by its Shariah board. A CCP should also document the specificities of Islamic collateral and disclose these to the participants.

[63] Variation collateral may also be called mark-to-market collateral or variation settlement in some jurisdictions.

ensure that trading through the Sharīʿah-compliant system does not employ any non-Sharīʿah-compliant means.[64]

Collateral requirements

139. One of the most common risk management tools used by CCPs to limit their credit exposure is a requirement that each participant provide collateral to protect the CCP against a high percentile of the distribution of future exposure. In this report, such requirements are described as collateral requirements. Collateral, however, is not the only risk management toolavailable to a CCP (see also Principle 4 on credit risk). In the case of some CCPs for cash markets, the CCP may require each participant to provide collateral to cover credit exposures; they may call these requirements collateral, or they may hold this collateral in a pool known as a clearing fund.[65]

140. When setting collateral requirements, a CCP should have a collateral system that establishes collateral levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves. Product risk characteristics can include, but are not limited to, price volatility and correlation, non-linear price characteristics, jump-to-default risk, market liquidity, possible liquidation procedures (e.g. tender by or commission to market-makers), and correlation between price and position such as wrong-way risk.[66] Collateral requirements need to account for the complexity of the underlying instruments and the availability of timely, high-quality pricing data. Furthermore, the appropriate close-out period may vary among products and markets depending upon the product's liquidity, price, and other characteristics. Additionally, a CCP for cash markets should take into account the risk of "fails to deliver" of securities (or other relevant instruments) in its collateral methodology. In a fails-to-deliver scenario, the CCP should continue to collateral positions for which a participant fails to deliver the required security (or other relevant instrument) on the settlement date.

[64] For example, by non-Shari'ah-compliant collateral or by investments in non-Shari'ah-compliant accounts or instruments.

[65] For the purposes of this standard, a clearing fund is a prefunded default arrangement.

[66] Correlation should not be understood to be limited to linear correlation, but rather to encompass a broad range of co-dependence or co-movement in relevant economic variables.

141. In a time of crisis, a CCP, in an effort to assist the market in a highly volatile environment, may consider to hold collateral calls/forced selling and temporarily taking a lenient haircut approach towards collaterals in the collateral system, while being mindful of the risk involved. A CCP may also consider accepting a broader list of collaterals and valuing them accordingly.

Price information

142. A CCP should have a reliable source of timely price data because such data is critical for a CCP's collateral system to operate accurately and effectively. In most cases, a CCP should rely on market prices from continuous, transparent, and liquid markets. If a CCP acquires pricing data from third-party pricing services, the CCP should continually evaluate the data's reliability and accuracy. A CCP should also have procedures and sound valuation models for addressing circumstances in which pricing data from markets or third-party sources are not readily available or reliable. A CCP should have its valuation models validated under a variety of market scenarios at least annually by a qualified and independent party to ensure that its model accurately produces appropriate prices, and where appropriate, the CCP should adjust its calculation of initial collateral to reflect any identified model risk.[67] A CCP should address all pricing and market liquidity concerns on an ongoing basis in order to conduct daily measurement of its risks.

143. For some markets, such as OTC markets, prices may not be reliable because of the lack of a continuous liquid market. In contrast to an exchange-traded market, there may not be a steady stream of live transactions from which to determine current market prices. Although independent third-party sources would be preferable, in some cases, participants may be an appropriate source of price data, as long as the CCP has a system that ensures that prices submitted by participants are reliable and accurately reflect the value of cleared products. Moreover, even when quotes are available, bid-ask spreads may be volatile and widen, particularly during times of market stress, thereby constraining the CCP's ability to measure accurately and promptly its exposure. In cases where price data is not available or

[67] Validation of the FMI's valuation procedures should be performed by personnel with sufficient expertise who are independent of the personnel that created and use the valuation procedures. These expert personnel could be drawn from within the FMI. However, a review by personnel external to the FMI may also be necessary at times.

reliable, a CCP should analyse historical information about actual trades submitted forclearing and indicative prices, such as bid-ask spreads, as well as the reliability of price data,especially in volatile and stressed markets, to determine appropriate prices. When prices are estimated, the systems and models used for this purpose must be subject to annual validation and testing.

Initial collateral methodology

144. A CCP should adopt initial collateral models and parameters that are risk-based and generate collateral requirements that are sufficient to cover its potential future exposures to participants in the interval between the last collateral collection and the close out of positions following a participant default. Initial collateral should meet an established single-tailed confidence level of at least 99 percent with respect to the estimated distribution of future exposure.[68] For a CCP that calculates collateral at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a CCP that calculates collateral at more-granular levels, such as at the subportfolio level or by product, the requirement must be met for the corresponding distributions of future exposure at a stage prior to collateral among subportfolios or products. The method selected by the CCP to estimate its potential future exposure should be capable of measuring and incorporating the effects of price volatility and other relevant product factors and portfolio effects over a close-out period that reflects the market size and dynamics for each product cleared by the CCP.[69] The estimation may account for the CCP's ability to implement effectively the hedging of future exposure. The method selected by the CCP should take into account correlations across product prices, market liquidity for close out or hedging, and the potential for non-linear risk exposures posed by certain products, including jump-to-default risks. A CCP should have the authority and operational capacity to make intraday initial collateral calls, both scheduled and unscheduled, to its participants.

[68] This concept parallels the technical definition of potential future exposure as a risk measure. See footnote 34.

[69] CCPs often calculate exposures for a shorter period, commonly one day, and, when necessary, scale up to cover the liquidation period. A CCP should be cautious when scaling because the standard square-root of time heuristic is not appropriate for prices that are serially correlated or exhibit non-linear dynamics.

145. *Close-out period.* A CCP should select an appropriate close-out period for each product that it clears and document the close-out periods and related analysis for each product type. A CCP should base its determination of the close-out periods for its initial collateral model upon historical price and liquidity data, as well as reasonably foreseeable events in a default scenario. The close-out period should account for the impact of a participant's default on prevailing market conditions. Inferences about the potential impact of a default on the close-out period should be based on historical adverse events in the product cleared, such as significant reductions in trading or other market dislocations. The close-out period should be based on anticipated close-out times in stressed market conditions but may also take into account a CCP's ability to hedge effectively the defaulter's portfolio. Further, close-out periods should be set on a product-specific basis because less-liquid products might require significantly longer close-out periods. A CCP should also consider and address position concentrations, which can lengthen close-out time frames and add to price volatility during close outs.

146. *Sample period for historical data used in the collateral model.* A CCP should select an appropriate sample period for its collateral model to calculate required initial collateral for each product that it clears and should document the period and related analysis for each product type. The amount of collateral may be very sensitive to the sample period and the collateral model. Selection of the period should be carefully examined based on the theoretical properties of the collateral model and empirical tests on these properties using historical data. In certain instances, a CCP may need to determine collateral levels using a shorter historical period to reflect new or current volatility in the market more effectively. Conversely, a CCP may need to determine collateral levels based on a longer historical period in order to reflect past volatility. A CCP should also consider simulated data projections that would capture plausible events outside of the historical data especially for new products without enough history to cover stressed market conditions.

147. *Specific wrong-way risk.* A CCP should identify and mitigate any credit exposure that may give rise to specific wrong-way risk. Specific wrong-way risk arises where an exposure to a counterparty is highly likely to increase when the creditworthiness of that counterparty is deteriorating. For example, participants in a CCP clearing credit-default swaps should not be allowed to clear single-name credit-default swaps on their own names or on the names of their legal affiliates. A CCP is expected to review its portfolio regularly in order to identify, monitor, and mitigate promptly any exposures that give rise to specific wrong-way risk.

148. *Limiting procyclicality.* A CCP should appropriately address procyclicality in its collateral arrangements. In this context, procyclicality typically refers to changes in risk-management practices that are positively correlated with market, business, or credit cycle fluctuations and that may cause or exacerbate financial instability. For example, in a period of rising price volatility or credit risk of participants, a CCP may require additional initial collateral for a given portfolio beyond the amount required by the current collateral model. This could exacerbate market stress and volatility further, resulting in additional collateral requirements. These adverse effects may occur without any arbitrary change in risk-management practices. To the extent practicable and prudent, a CCP should adopt forward-looking and relatively stable and conservative collateral requirements that are specifically designed to limit the need for destabilising, procyclical changes. To support this objective, a CCP could consider increasing the size of its prefunded default arrangements to limit the need and likelihood of large or unexpected collateral calls in times of market stress. These procedures may create additional costs for CCPs and their participants in periods of low market volatility due to higher collateral or prefunded default arrangement contributions, but they may also result in additional protection and potentially less costly and less disruptive adjustments in periods of high market volatility. In addition, transparency regarding collateral practices when market volatility increases may help mitigate the effects of procyclicality. Nevertheless, it may be impractical and even imprudent for a CCP to establish collateral requirements that are independent of significant or cyclical changes in price volatility.

Variation collateral

149. A CCP faces the risk that its exposure to its participants can change rapidly as a result of changes in prices, positions, or both. Adverse price movements, as well as participants building larger positions through new trading, can rapidly increase a CCP's exposures to its participants (although some markets may impose trading limits or position limits that reduce this risk). A CCP can ascertain its current exposure to each participant by marking each participant's outstanding positions to current market prices. To the extent permitted by a CCP's rules and supported by law, the CCP should net any gains against any losses and require frequent (at least daily) settlement of gains and losses. This settlement should involve the daily (and, when appropriate, intraday) collection of variation collateral from participants whose positions have lost value and can include payments to participants whose positions have gained value. The regular collection of variation collateral prevents current exposures from accumulating and mitigates the potential future exposures a CCP might face. A CCP should also have the authority and operational capacity to make intraday variation

collateral calls and payments, both scheduled and unscheduled, to its participants. A CCP should consider the potential impact of its intraday variation collateral collections and paymentson the liquidity position of its participants and should have the operational capacity to make intraday variation collateral payments.

Portfolio collateral

150. In calculating collateral requirements, a CCP may allow offsets or reductions in required collateral amounts between products for which it is the counterparty if the risk of one product is significantly and reliably correlated with the risk of another product. A CCP should base such offsets on an economically meaningful methodology that reflects the degree of price dependence between the products. Often, price dependence is modelled through correlations, but more complete or robust measures of dependence should beconsidered, particularly for non-linear products. In any case, the CCP should consider how price dependence can vary with overall market conditions, including in stressed market conditions. Following the application of offsets, the CCP needs to ensure that the collateral meets or exceeds the single-tailed confidence level of at least 99 percent with respect to the estimated distribution of the future exposure of the portfolio. If a CCP uses portfolio collateral, it should continuously review and test offsets among products. It should test the robustness of its portfolio method on both actual and appropriate hypothetical portfolios. It is especially important to test how correlations perform during periods of actual and simulated market stress to assess whether the correlations break down or otherwise behave erratically. Prudent assumptions informed by these tests should be made about product offsets.

Cross-collateral

151. Two or more CCPs may enter into a cross-collateral arrangement, which is an agreement among the CCPs to consider positions and supporting collateral at their respective organisations as a common portfolio for participants that are members of two or more of the organisations (see also Principle 20 on FMI links). The aggregate collateral requirements for positions held in cross-collateral accounts may be reduced if the value of the positions held at the separate CCPs move inversely in a significant and reliable fashion. In the event of a participant default under a cross-collateral arrangement, participating CCPs may be allowed to use any excess collateral in the cross-collateral accounts to cover losses.

152. CCPs that participate in cross-collateral arrangements must share information frequently and ensure that they have appropriate safeguards, such as joint monitoring of

positions, collateral collections, and price information. Each CCP must thoroughly understand the others' respective risk management practices and financial resources. The CCPs should also have harmonised overall risk management systems and should regularly monitor possible discrepancies in the calculation of their exposures, especially with regard to monitoring how price correlations perform over time. This harmonisation is especially relevant in terms of selecting an initial collateral methodology, setting collateral parameters, segregating accounts and collateral, and establishing default-management arrangements. All of the precautions with regard to portfolio collateral discussed above would apply to cross-collateral regimes between or among CCPs. CCPs operating a cross-collateral arrangement should also analyse fully the impact of cross-collateral on prefunded default arrangements and on the adequacy of overall financial resources. The CCPs must have in place arrangements that are legally robust and operationally viable to govern the cross-collateral arrangement.

Testing collateral coverage

153. A CCP should analyse and monitor its model performance and overall collateral coverage by conducting rigorous daily backtesting and at least monthly, and more-frequent as appropriate, sensitivity analysis. A CCP also should regularly conduct an assessment of the theoretical and empirical properties of its collateral model for all products it clears. In order to validate its collateral models and parameters, a CCP should have a backtesting programme that tests its initial collateral models against identified targets. Backtesting is an ex-post comparison of observed outcomes with the outputs of the collateral models. A CCP should alsoconduct sensitivity analysis to assess the coverage of the collateral methodology under variousmarket conditions using historical data from realised stressed market conditions and hypothetical data for unrealised stressed market conditions. Sensitivity analysis should also be used to determine the impact of varying important model parameters. Sensitivity analysis is an effective tool to explore hidden shortcomings that cannot be discovered through backtesting. The results of both the backtesting and sensitivity analyses should be disclosed to participants.

154. *Backtesting.* A CCP should backtest its collateral coverage using participant positions from each day in order to evaluate whether there are any exceptions to its initial collateral coverage. This assessment of collateral coverage should be considered an integral part of the evaluation of the model's performance. Coverage should be evaluated across products and participants and take into account portfolio effects across asset classes within the CCP. The initial collateral model's actual coverage, along with projected measures of its performance, should meet at least the established single-tailed confidence level of 99 percent with respect

to the estimated distribution of future exposure over an appropriate close-out period.[70] In case backtesting indicates that the model did not perform as expected (i.e. the model did not identify the appropriate amount of initial collateral necessary to achieve the intended coverage), a CCP should have clear procedures for recalibrating its collateral system, such as by making adjustments to parameters and sampling periods. In addition, a CCP should evaluate the source of backtesting exceedances to determine if a fundamental change to the collateral methodology is warranted or if only the recalibration of current parameters is necessary. Backtesting procedures alone are not sufficient to evaluate the effectiveness of models and adequacy of financial resources against forward-looking risks.

155. *Sensitivity analysis.* A CCP should test the sensitivity of its collateral model coverage using a wide range of parameters and assumptions that reflect possible market conditions in order to understand how the level of collateral coverage might be affected by highly stressed market conditions. The FMI should ensure that the range of parameters and assumptions captures a variety of historical and hypothetical conditions, including the most-volatile periods that have been experienced by the markets it serves and extreme changes in the correlations between prices. The CCP should conduct sensitivity analysis on its collateral model coverage at least monthly using the results of these sensitivity tests and conduct a thorough analysis of the potential losses it could suffer. A CCP should evaluate the potential losses in individual participants' positions and, where appropriate, their customers' positions. Furthermore, for a CCP clearing credit instruments, parameters reflective of the simultaneous default of both participants and the underlying credit instruments should be considered. Sensitivity analysis should be performed on both actual and simulated positions. Rigorous sensitivity analysis of collateral requirements may take on increased importance when markets are illiquid or volatile. This analysis should be conducted more frequently when markets are unusually volatile or less liquid or when the size or concentration of positions held by its participants increases significantly.

[70] This period should be appropriate to capture the risk characteristics of the specific instrument in order to allow the CCP to estimate the magnitude of the price changes expected to occur in the interval between the last collateral collection and the time the CCP estimates it will be able to close out the relevant positions.

Validation of the collateral methodology

156. A CCP should regularly review and validate its collateral system. A CCP's collateral methodology should be reviewed and validated by a qualified and independent party at least annually, or more frequently if there are material market developments. Any material revisions or adjustments to the methodology or parameters should be subject to appropriate governance processes (see also Principle 2 on governance) and validated prior to implementation. CCPs operating a cross-collateral arrangement should also analyse the impact of cross-collateral on prefunded default arrangements and evaluate the adequacy of overall financial resources. Also, the collateral methodology, including the initial collateral models and parameters used by a CCP, should be made as transparent as possible. At a minimum, the basic assumptions of the analytical method selected and the key data inputs should be disclosed to participants. Ideally, a CCP would make details of its collateral methodology available to its participants for use in their individual risk management efforts.

Timeliness and possession of collateral payments

157. A CCP should establish and rigorously enforce timelines for collateral collections and payments and set appropriate consequences for failure to pay on time. A CCP with participants in a range of time zones may need to adjust its procedures for collateral (including the times at which it makes collateral calls) to take into account the liquidity of a participant's local funding market and the operating hours of relevant payment and settlement systems. Collateral should be held by the CCP until the exposure has been extinguished; that is, collateral should not be returned before settlement is successfully concluded.

PS	CSD	SSS	CCP	TR
●		●	●	

Principle 7: Liquidity risk

An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient Sharīʿah-compliant liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.

158. Because of the extensive interactions between the financial risk management and financial resources principles, this principle should be reviewed in the context of Principle 4 on credit risk, Principle 5 on collateral and Principle 6 on calculation of collateral, as appropriate. This principle should also be reviewed in the context of Principle 8 on settlement finality, Principle 13 on participant default rules and procedures, Principle 23 on disclosure of rules, key procedures and market data, and other principles, as appropriate.

Key considerations

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	●		●	●	

1. *An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities in a Sharīʿah-compliant manner.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	●		●	●	

2. *An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	•		•		

3. *A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
				•	

4. *A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation collateral payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	•		•	•	

5. *For the purpose of meeting its minimum liquid resource requirement, an FMI's Sharīʿah-compliant qualifying liquid resources in each currency include, for example, cash at the central bank of issue and at creditworthy commercial banks, and committed lines of credit, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of*

transactions with) the relevant central bank. All such resources should be available when needed.

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	●		●	●	

6. *An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	●		●	●	

7. *An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	●		●	●	

8. *An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical and Sharīʿah-compliant, to enhance its management of liquidity risk.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	●		●	●	

9. *An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to*

use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.

The following key consideration applies to	PS	CSD	SSS	CCP	TR
	•		•	•	

10. An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.

Questions by key consideration

Key consideration 1:

Q.7.1.1: What is the FMI's framework for managing its liquidity risks, in all relevant currencies, from its participants, settlement banks, nostro agents, custodian banks, liquidity providers and other entities?

Q.7.1.2: What are the nature and size of the FMI's liquidity needs, and the associated sources of liquidity risks, that arise in the FMI in all relevant currencies?

Q.7.1.3: How does the FMI take into account the potential aggregate liquidity risk presented by an individual entity and its affiliates that may play multiples roles with respect to the FMI?

Key consideration 2:

Q.7.2.1: What operational and analytical tools does the FMI have to identify, measure and monitor settlement and funding flows?

Q.7.2.2: How does the FMI use those tools to identify, measure and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity?

Key consideration 3:

Q.7.3.1: How does the payment system or SSS determine the amount of liquid resources in all relevant currencies to effect same day settlement and, where appropriate, intraday or multiday settlement of payment obligations? What potential stress scenarios (including, but not limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions) does the payment system or SSS use to make this determination?

Q.7.3.2: What is the estimated size of the liquidity shortfall in each currency that the payment system or SSS would need to cover?

Key consideration 4:

Sufficient liquid resources

Q.7.4.1: How does the CCP determine the amount of liquid resources in all relevant currencies to settle securities-related payments, make required variation collateral payments and meet other payment obligations on time? What potential stress scenarios (including, but not limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions) does the CCP use to make this determination?

Q.7.4.2: What is the estimated size of the liquidity shortfall in each currency that would need to be covered, following the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions? How frequently does the CCP estimate this?

Risk profile and systemic importance in multiple jurisdictions

Q.7.4.3: Do any of the CCP's activities have a more complex risk profile (such as clearing financial instruments that are characterised by discrete jump-to-default price changes or that are highly correlated with potential participant defaults)? Is the CCP systemically important in multiple jurisdictions?

Q.7.4.4: If the CCP is involved in activities with a more complex risk profile or is systemically important in multiple jurisdictions, has the CCP considered maintaining additional resources sufficient to cover a wider range of stress scenarios that would include the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions?

Key consideration 5:

Size and composition of qualifying liquid resources

Q.7.5.1: What is the size and composition of the FMI's qualifying liquid resources in each currency that is held by the FMI? In what manner and within what time frame can these liquid resources be made available to the FMI?

Availability and coverage of qualifying liquid resources

Q.7.5.2: What prearranged funding arrangements has the FMI established to convert its readily available collateral and investments into cash? How has the FMI established that these arrangements would be highly reliable in extreme but plausible market conditions? Has the FMI identified any potential barriers to accessing its liquid resources?

Q.7.5.3: If the FMI has access to routine credit at the central bank of issue, what is the FMI's relevant borrowing capacity for meeting its minimum liquid resource requirement in that currency?

Q.7.5.4: To what extent does the size and the availability of the FMI's qualifying liquid resources cover its identified minimum liquidity resource requirement in each currency to effect settlement of payment obligations on time?

Key consideration 6:

Size and composition of supplemental liquid resources

Q.7.6.1: What is the size and composition of any supplemental liquid resources available to the FMI?

Availability of supplemental liquid resources

Q.7.6.2: How and on what basis has the FMI determined that these assets are likely to be saleable or acceptable as collateral to obtain the relevant currency, even if this cannot be reliably prearranged or guaranteed in extreme market conditions?

Q.7.6.3: What proportion of these supplemental assets qualifies as potential collateral at the relevant central bank?

Q.7.6.4: In what circumstances would the FMI use its supplemental liquid resources in advance of, or in addition to, using its qualifying liquid resources?

Q.7.6.5: To what extent does the size and availability of the FMI's supplemental liquid resources, in conjunction with its qualifying liquid resources, cover the relevant liquidity needs identified through the FMI's stress test programme for determining the adequacy of its liquidity resources (see key consideration 9)?

Key consideration 7:

Use of liquidity providers

Q.7.7.1: Does the FMI use a liquidity provider to meet its minimum required qualifying liquidity resources? Who are the FMI's liquidity providers? How and on what basis has the FMI determined that each of these liquidity providers has sufficient information to understand and to manage their associated liquidity risk in each relevant currency on an ongoing basis, including in stressed conditions?

Reliability of liquidity providers

Q.7.7.2: How has the FMI determined that each of its liquidity providers has the capacity to perform on its commitment in each relevant currency on an ongoing basis?

Q.7.7.3: How does the FMI take into account a liquidity provider's potential access to credit at the central bank of issue?

Q.7.7.4: How does the FMI regularly test the timeliness and reliability of its procedures for accessing its liquid resources at a liquidity provider?

Key consideration 8:

Q.7.8.1: To what extent does the FMI currently have, or is the FMI eligible to obtain, access to accounts, payment services and securities services at each relevant central bank that could be used to conduct its payments and settlements and to manage liquidity risks in each relevant currency?

Q.7.8.2: What are the arrangements in place with the central bank to ensure the accounts or services used by the FMI are Sharīʻah-compliant?

Q.7.8.3: To what extent does the FMI use each of these services at each relevant central bank to conduct its payments and settlements and to manage liquidity risks in each relevant currency?

Q.7.8.4: If the FMI employs services other than those provided by the relevant central banks, to what extent has the FMI analysed the potential to enhance the management of liquidity risk by expanding its use of central bank services?

Q.7.8.5: What, if any, practical or other considerations to expanding its use of relevant central bank services have been identified by the FMI?

Key consideration 9:

Stress test programme

Q.7.9.1: How does the FMI use stress testing to determine the amount and test the sufficiency of its liquid resources in each currency? How frequently does the FMI stress-test its liquid resources?

Q.7.9.2: What is the process for reporting on an ongoing basis the results of the FMI's liquidity stress tests to appropriate decision-makers at the FMI, for the purpose of supporting their timely evaluation and adjustment of the size and composition of the FMI's liquidity resources and liquidity risk management framework?

Stress test scenarios

Q.7.9.3: What scenarios are used in the stress tests, and to what extent do they take into account a combination of peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions?

Q.7.9.4: To what extent do the scenarios and stress tests take into account the FMI's particular payment and settlement structure (e.g. real-time gross or deferred net; with or without a settlement guarantee; DVP model 1, 2 or 3 for SSSs), and the liquidity risk that is borne directly by the FMI, by its participants, or both?

Q.7.9.5: To what extent do the scenarios and stress tests take into account the nature and size of the liquidity needs, and the associated sources of liquidity risks, that arise in the FMI to settle its payment obligations on time, including the potential that individual entities and their affiliates may play multiple roles with respect to the FMI?

Review and validation

Q.7.9.6: How frequently does the FMI assess the effectiveness and appropriateness of stress test assumptions and parameters? How does the FMI's stress test programme take into account various conditions, such as a sudden and significant increase in position and price volatility, position concentration, change in market liquidity, and model risk including shift of parameters?

Q.7.9.7: How does the FMI validate its risk management model? How frequently does it perform this validation?

Q.7.9.8: Where and to what extent does the FMI document its supporting rationale for, and its governance arrangements relating to, the amount and form of its total liquid resources?

Key consideration 10:

Same day settlement

Q.7.10.1: How do the FMI's rules and procedures enable it to settle payment obligations on time following any individual or combined default among its participants?

Q.7.10.2: How do the FMI's rules and procedures address unforeseen and potentially uncovered liquidity shortfalls and avoid unwinding, revoking or delaying the same day settlement of payment obligations?

Replenishment of liquidity resources

Q.7.10.3: How do the FMI's rules and procedures allow for the replenishment of any liquidity resources employed during a stress event?

Explanatory note

159. Liquidity risk arises in an FMI when it, its participants, or other entities cannot settle their payment obligations when due as part of the clearing or settlement process. Depending on the design of an FMI, liquidity risk can arise between the FMI and its participants, between the FMI and other entities (such as its settlement banks, nostro agents, custodian banks, and liquidity providers), or between participants in an FMI (such as in a DNS paymentsystem or SSS). It is particularly important for an FMI to manage carefully its liquidity risk if, as is typical in many systems, the FMI relies on incoming payments from participants or otherentities during the settlement process in order to make payments to other participants. If a participant or another entity fails to pay the FMI, the FMI may not have sufficient funds to meet its payment obligations to other participants. In such an event, the FMI would need to rely on its own liquidity resources (i.e. liquid assets and prearranged funding arrangements) to cover the funds shortfall and complete settlement. An FMI should have a robust framework to manage its liquidity risks from the full range of participants and other entities. In some cases, a participant may play other roles within the FMI, such as a settlement or custodian bank or

liquidity provider. These other roles should be considered in determining an FMI's liquidity needs.

Sources of liquidity risk

160. An FMI should clearly identify its sources of liquidity risk and assess its current and potential future liquidity needs on a daily basis. An FMI can face liquidity risk from the default of a participant. For example, if an FMI extends intraday credit, implicitly or explicitly, to participants, such credit, even when fully collateralised, may create liquidity pressure in the event of a participant default. The FMI might not be able to convert quickly the defaulting participant's collateral into cash at short notice. If an FMI does not have sufficient cash to meet all of its payment obligations to participants, there will be a settlement failure. An FMI can also face liquidity risk from its settlement banks, nostro agents, custodian banks, and liquidity providers, as well as linked FMIs and service providers, if they fail to perform as expected. Moreover, as noted above, an FMI may face additional risk from entities that have multiple roles within the FMI (e.g. a participant that also serves as the FMI's settlement bank or liquidity provider). These interdependencies and the multiple roles that an entity may serve within an FMI should be taken into account by the FMI.

161. An FMI that employs a DNS mechanism may create direct liquidity exposures between participants. For example, in a payment system that uses a multilateral net settlement mechanism, participants may face liquidity exposures to each other if one of the participants fails to meet its obligations. Similarly, in an SSS that uses a DvP model 2 or 3 settlement mechanism and does not guarantee settlement, participants may face liquidity exposures to each other if one of the participants fails to meet its obligations.[71] A long-standing concern is that these types of systems may address a potential settlement failure by unwinding transfers involving the defaulting participant.[72] An unwind imposes liquidity pressures (and, potentially, replacement costs) on the non-defaulting participants. If all such transfers must be deleted, and if the unwind occurs at a time when markets are illiquid (e.g. at or near the end of the day), the remaining participants could be confronted with shortfalls of funds or securities that

[71] See also Annex F on summary of designs of payment systems, SSSs, and CCPs.

[72] Unwinding involves deleting some or all of the defaulting participant's provisional funds transfers and, in an SSS, securities transfers and then recalculating the settlement obligations of the other participants.

would be extremely difficult to cover. The potential total liquidity pressure of unwinding could be equal to the gross value of the netted transactions.

Measuring and monitoring liquidity risk

162. An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity. In particular, an FMI should understand and assess the value and concentration of its daily settlement and funding flows through its settlement banks, nostro agents, and other intermediaries. An FMI also should be able to monitor on a daily basis the level of liquid assets (such as cash, securities, other assets held in custody, and investments) that it holds. An FMI should be able to determine the value of its available liquid assets, taking into account the appropriate haircuts on those assets (see Principle 5 on collateral and Principle 6 on calculation of collateral). In a DNS system, the FMI should provide sufficient information and analytical tools to help its participants measure and monitor their liquidity risks in the FMI.

163. If an FMI maintains prearranged funding arrangements, the FMI should also identify, measure, and monitor its liquidity risk from the liquidity providers of those arrangements. An FMI should obtain a high degree of confidence through rigorous due diligence that each liquidity provider, whether or not it is a participant in the FMI, would have the capacity to perform as required under the liquidity arrangement and is subject to commensurate regulation, supervision, or oversight of its liquidity risk management requirements. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, the liquidity provider’s potential access to credit from the relevant central bank may be taken into account.

Managing liquidity risk

164. An FMI should also regularly assess its design and operations to manage liquidity risk in the system. An FMI that employs a DNS mechanism may be able to reduce its or its participants’ liquidity risk by using alternative settlement designs, such as new RTGS designs with liquidity-saving features or a continuous or extremely frequent batch settlement system. In addition, it could reduce the liquidity demands of its participants by providing participants with sufficient information or control systems to help them manage their liquidity needs and risks. Furthermore, an FMI should ensure that it is operationally ready to manage the liquidity risk caused by participants’ or other entities’ financial or operational problems. Among other

things, the FMI should have the operational capacity to reroute payments, where feasible, on a timely basis in case of problems with a correspondent bank.

165. An FMI has other risk management tools that it can use to manage its or, where relevant, its participants' liquidity risk. To mitigate and manage liquidity risk stemming from a participant default, an FMI could use, either individually or in combination, exposure limits, collateral requirements, and prefunded default arrangements. To mitigate and manage liquidity risks from the late-day submission of payments or other transactions, an FMI could adopt rules or financial incentives for timely submission. To mitigate and manage liquidity risk stemming from a service provider or a linked FMI, an FMI could use, individually or in combination, selection criteria, concentration or exposure limits, and collateral requirements. For example, an FMI should seek to manage or diversify its settlement flows and liquid resources to avoid excessive intraday or overnight exposure to one entity. This, however, may involve trade-offs between the efficiency of relying on an entity and the risks of being overly dependent on that entity. These tools are often also used by an FMI to manage its credit risk.

Maintaining sufficient liquid resources for payment systems and SSSs

166. An FMI should ensure that it has sufficient liquid resources, as determined by regular and rigorous stress testing, to effect settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios. A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday or multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions. In some instances, a payment system or SSS may need to have sufficient liquid resources to effect settlement of payment obligations over multiple days to account for any potential liquidation of collateral that is outlined in the FMI's participant-default procedures.

Maintaining sufficient liquid resources for CCPs

167. Similarly, a CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payment obligations, make required variation collateral payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to

the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. The CCP should carefully analyse its liquidity needs, and the analysis is expected to be reviewed by the relevant authorities. In many cases, a CCP may need to maintain sufficient liquid resources to meet payments to settle required collateral and other payment obligations over multiple days to account for multiday hedging and close-out activities as directed by the CCP's participant-default procedures.

Liquid resources for meeting the minimum requirement

168. For the purpose of meeting its minimum liquid resource requirement, an FMI's qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed. However, such access does not eliminate the need for sound risk management practices and adequate access to private-sector liquidity resources.[73]

Other liquid resources

169. An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets

[73] The authority or authorities with primary responsibility for an FMI will assess the adequacy of an FMI's liquidity risk management procedures, considering the views of the central banks of issue in accordance with Responsibility E.

that are likely to be saleable or acceptable as collateral for lines of credit or other financing mechanisms on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. An FMI may consider using such resources within its liquidity risk management framework in advance of, or in addition to, using its qualifying liquid resources. This may be particularly beneficial where liquidity needs exceed qualifying liquid resources, where qualifying liquid resources can be preserved to cover a future default, or where using other liquid resources would cause less liquidity dislocation to the FMI's participants and the financial system as a whole. Even if an FMI does not have access to routine central bank credit, it should take account of what collateral is typically accepted by the relevant central bank of issue, as such assets may be more likely to be liquid in stressed circumstances. In any case, an FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.

Assessing liquidity providers

170. If an FMI has prearranged funding arrangements, the FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider’s potential access to credit from the central bank of issue may be taken intoaccount. Additionally, an FMI should adequately plan for the renewal of prearranged funding arrangements with liquidity providers in advance of their expiration.

Procedures regarding the use of liquid resources

171. An FMI should have detailed procedures for using its liquid resources to complete settlement during a liquidity shortfall. An FMI’s procedures should clearly document the sequence for using each type of liquid resource (e.g. the use of certain assets before prearranged funding arrangements). These procedures may include instructions for accessing cash deposits or overnight investments of cash deposits, executing same-day market transactions, or drawing on prearranged liquidity lines. In addition, an FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider, including by activating and drawing down test amounts from committed credit facilities and by testing operational procedures for conducting same-day repos.

Central bank services

172. If an FMI has access to central bank accounts, payment services, securities services, or collateral management services, it should use these services, where practical, to enhance its management of liquidity risk. Cash balances at the central bank of issue, for example, offer the highest liquidity (see Principle 9 on money settlements). An FMI that has such access should also seek arrangements with the central bank to ensure that it neither receives nor pays interest and complies with other Sharī'ah requirements.

Stress testing of liquidity needs and resources

173. An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use these results to evaluate the adequacy of and adjust its liquidity risk management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios.Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also consider the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. An FMI should also consider any strong inter-linkages or similar exposures between its participants, as well as the multiple roles that participants may play with respect to the risk managementof the FMI, and assess the probability of multiple failures and the contagion effect among its participants that such failures may cause.

174. *Reverse stress tests.* An FMI should conduct, as appropriate, reverse stress tests aimed at identifying the extreme default scenarios and extreme market conditions for which the FMI's liquid resources would be insufficient. In other words, these tests identify how severe stress conditions would be covered by the FMI's liquid resources. An FMI should judge whether it would be prudent to prepare for these severe conditions and various combinations of factors influencing these conditions. Reverse stress tests require an FMI to model extreme market conditions that may go beyond what are considered extreme but plausible market conditions in order to help understand the sufficiency of liquid resources given the underlying assumptions modelled. Modelling extreme market conditions can help an FMI determine the limits of its

current model and resources; however, it requires the FMI to exercise judgment when modelling different markets and products. An FMI should develop hypothetical extreme scenarios and market conditions tailored to the specific risks of the markets and of the products it serves. Reverse stress tests should be considered a helpful risk management tool but they need not, necessarily, drive an FMI's determination of the appropriate level of liquid resources.

175. *Frequency of stress testing.* Liquidity stress testing should be performed on a daily basis using standard and predetermined parameters and assumptions. In addition, on at least a monthly basis, an FMI should perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for achieving the FMI's identified liquidity needs and resources in light of current and evolving market conditions. An FMI should perform stress testing more frequently when markets are unusually volatile, when they are less liquid, or when the size or concentration of positions held by its participants increases significantly. A full validation of an FMI's liquidity risk management model should be performed at least annually.

Contingency planning for uncovered liquidity shortfalls

176. In certain extreme circumstances, the liquid resources of an FMI or its participants may not be sufficient to meet the payment obligations of the FMI to its participants or the payment obligations of participants to each other within the FMI.[74] In a stressed environment, for example, normally liquid assets held by an FMI may not be sufficiently liquid to obtain same-day funding, or the liquidation period may be longer than expected. An FMI should establish explicit rules and procedures that enable the FMI to effect same-day, and where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.

[74] These exceptional circumstances could arise from unforeseen operational problems or unanticipated rapid changes in market conditions.

177. If an FMI allocates potentially uncovered liquidity shortfalls to its participants, the FMI should have clear and transparent rules and procedures for the allocation of shortfalls. These procedures could involve a funding arrangement between the FMI and its participants,the mutualisation of shortfalls among participants according to a clear and transparent formula, or the use of liquidity rationing (e.g. reductions in payouts to participants). Any allocation rule or procedure must be discussed thoroughly with and communicated clearly to participants, as well as be consistent with participants' respective regulatory liquidity risk management requirements. Furthermore, an FMI should consider and validate, through simulations and other techniques and through discussions with each participant, the potential impact on each participant of any such same-day allocation of liquidity risk andeach participant's ability to bear proposed liquidity allocations.

Settlement

PS	CSD	SSS	CCP	TR
●		●	●	

Principle 8: Settlement finality

An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.

178. In reviewing this principle, it should be noted that this principle is not intended to eliminate failures to deliver in securities trades. The occurrence of non-systemic amounts of such failures, although potentially undesirable, should not by itself be interpreted as a failure to satisfy this principle. This principle should be reviewed in the context of Principle 9 on money settlements, Principle 20 on FMI links, and other principles, as appropriate.

Key considerations

1. *An FMI's rules and procedures should clearly define the point at which settlement is final.*

2. *An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.*

3. *An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.*

Questions by key consideration

Key consideration 1:

Point of settlement finality

Q.8.1.1: At what point is the settlement of a payment, transfer instruction or other obligation final, meaning irrevocable and unconditional? Is the point of

settlement finality defined and documented? How and to whom is this information disclosed?

Q.8.1.2: How does the FMI's legal framework and rules, including the applicable insolvency law(s), acknowledge the discharge of a payment, transfer instruction or other obligation between the FMI and its participants, or between participants?

Q.8.1.3: How does the FMI demonstrate that there is a high degree of legal certainty that finality will be achieved in all relevant jurisdictions (e.g. by obtaining a well-reasoned legal opinion)?

Finality in the case of links

Q.8.1.4: How does the FMI ensure settlement finality in the case of linkages with other FMIs?

a) For an SSS, how is consistency of finality achieved between the SSS and, if relevant, the LVPS where the cash leg is settled?

b) For a CCP for cash products, what is the relation between the finality of obligations in the CCP and the finality of the settlement of the CCP claims and obligations in other systems, depending on the rules of the relevant CSD/SSS and payment system?

Key consideration 2:

Final settlement on the value date

Q.8.2.1: Is the FMI designed to complete final settlement on the value date (or same day settlement)? How does the FMI ensure that final settlement occurs no later than the end of the intended value date?

Q.8.2.2: Has the FMI ever experienced deferral of final settlement to the next business day that was not contemplated by its rules, procedures or contracts? If so, under what circumstances? If deferral was a result of the FMI's actions, what steps have been taken to prevent a similar situation in the future?

Intraday or real-time final settlement

Q.8.2.3: Does the FMI provide intraday or real-time final settlement? If so, how? How are participants informed of the final settlement?

Q.8.2.4: If settlement occurs through multiple-batch processing, what is the frequency of the batches and within what time frame do they operate? What happens if a participant does not have enough funds or securities at the settlement time? Are transactions entered in the next batch? If so, what is the status of those transactions and when would they become final?

Q.8.2.5: If settlement does not occur intraday or in real time, how has the LVPS or SSS considered the introduction of either of these modalities?

Key consideration 3:

Q.8.3.1: How does the FMI define the point at which unsettled payments, transfer instructions or other obligations may not be revoked by a participant? How does the FMI prohibit the unilateral revocation of accepted and unsettled payments, transfer instructions or obligations after this time?

Q.8.3.2: Under what circumstances can an instruction or obligation accepted by the system for settlement still be revoked (e.g. queued obligations)? How can an unsettled payment or transfer instruction be revoked? Who can revoke unsettled payment or transfer instructions?

Q.8.3.3: Under what conditions does the FMI allow exceptions and extensions to the revocation deadline?

Q.8.3.4: Where does the FMI define this information? How and to whom is this information disclosed?

Explanatory note

179. An FMI should be designed to provide clear and certain final settlement of payments, transfer instructions, or other obligations. Final settlement is defined as the irrevocable and

unconditional transfer of an asset or financial instrument, or the discharge of an obligation by the FMI or its participants in accordance with the terms of the underlying contract.[75] A payment, transfer instruction, or other obligation that an FMI accepts for settlement in accordance with its rules and procedures should be settled with finality on the intended value date.[76] The value date is the day on which the payment, transfer instruction, or other obligation is due and the associated funds and securities are typically available to the receiving participant.[77] Completing final settlement by the end of the value date is important because deferring final settlement to the next-business day can create both credit and liquidity pressures for an FMI's participants and other stakeholders, and potentially be a source of systemic risk. Where necessary or preferable, an FMI should provide intraday or real-time settlement finality to reduce settlement risk.

180. Although some FMIs guarantee settlement, this principle does not necessarily require an FMI to provide such a guarantee. Instead, this principle requires FMIs to clearly define the point at which the settlement of a payment, transfer instruction, or other obligation is final, and to complete the settlement process no later than the end of the value date, and preferably earlier in the value date. Similarly, this principle is not intended to eliminate fails to deliver in securities trades.[78] The occurrence of non-systemic amounts of such failures, although potentially undesirable, should not by itself be interpreted as a failure to satisfy this principle.[79] However, an FMI should take steps to mitigate both the risks and the implications of such failures to deliver securities (see Principle 4 on credit risk, Principle 7 on liquidity risk, and other relevant principles).

Final settlement

181. An FMI's rules and procedures should clearly define the point at which settlement is final. A clear definition of when settlements are final also greatly assists in a resolution scenario

[75] Final settlement (or settlement finality) is a legally defined moment. See also Principle 1 on legal basis.

[76] The value date of an FMI's settlement activity might not necessarily coincide with the exact calendar date if the FMI introduces night-time settlement.

[77] This principle is not intended to discourage an FMI from offering a facility for entering transaction details in advance of the value date.

[78] These fails typically occur because of miscommunication between the counterparties, operational problems in the delivery of securities, or failure to acquire a specific security associated with the trade by a specific point in time.

[79] In certain markets, participants may have adopted the convention of rescheduling delivery until the trade finally settles.

such that the positions of the participant in resolution and other affected parties can be quickly ascertained.

182. An FMI's legal framework and rules generally determine finality. The legal basis governing the FMI, including the insolvency law, must acknowledge the discharge of a payment, transfer instruction, or other obligation between the FMI and system participants, or between or among participants, for the transaction to be considered final. An FMI should take reasonable steps to confirm the effectiveness of cross-border recognition and protection of cross-system settlement finality, especially when it is developing plans for recovery or orderly wind-down or providing relevant authorities information relating to its resolvability. Because of the complexity of legal frameworks and system rules, particularly in the context of cross-border settlement where legal frameworks are not harmonised, a well-reasoned legal opinion is generally necessary to establish the point at which finality takes place (see also Principle 1 on legal basis).

Same-day settlement

183. An FMI's processes should be designed to complete final settlement, at a minimum no later than the end of the value date. This means that any payment, transfer instruction, or other obligation that has been submitted to and accepted by an FMI in accordance with its risk management and other relevant acceptance criteria should be settled on the intended value date. An FMI that is not designed to provide final settlement on the value date (or same-day settlement) would not satisfy this principle, even if the transaction's settlement date is adjusted back to the value date after settlement. This is because, in most of such arrangements, there is no certainty that final settlement will occur on the value date as expected. Further, deferral of final settlement to the next-business day can entail overnight risk exposures. For example, if an SSS or CCP conducts its money settlements using instruments or arrangements that involve next-day settlement, a participant's default on its settlement obligations between the initiation and finality of settlement could pose significant credit and liquidity risks to the FMI and its other participants.[80]

[80] In most cases, next-day settlements over weekend periods involve multi-day settlement risk.

Intraday settlement

184. Depending on the type of obligations that an FMI settles, the use of intraday settlement, either in multiple batches or in real time, may be necessary or desirable to reduce settlement risk.[81] As such, some types of FMIs, such as LVPSs and SSSs, should consider adopting RTGS or multiple-batch settlement to complete final settlement intraday. RTGS is the real-time settlement of payments, transfer instructions, or other obligations individually on a transaction-by-transaction basis. Batch settlement is the settlement of groups of payments, transfer instructions, or other obligations together at one or more discrete, often pre-specified times during the processing day. With batch settlement, the time between the acceptance and final settlement of transactions should be kept short.[82] To speed up settlements, an FMI should encourage its participants to submit transactions promptly. To validate the finality of settlement, an FMI also should inform its participants of their final account balances and, where practical, settlement date and time as quickly as possible, preferably in real time.[83]

185. The use of multiple-batch settlement and RTGS involves different trade-offs. Multiple-batch settlement based on a DNS mechanism, for example, may expose participants to settlement risks for the period during which settlement is deferred. These risks, if not sufficiently controlled, could result in the inability of one or more participants to meet their financial obligations. Conversely, while an RTGS system can mitigate or eliminate these settlement risks, it requires participants to have sufficient liquidity to cover all their outgoing payments and can therefore require relatively large amounts of intraday liquidity. This liquidity can come from various sources, including balances at a central bank or commercial bank, incoming payments, and intraday credit. An RTGS system may be able to reduce its liquidity needs by implementing a queuing facility or other liquidity-saving mechanisms.

[81] For example, intraday or real-time finality is sometimes necessary for monetary policy or payments operations, settlement of back-to-back transactions, intraday collateral calls by CCPs, or safe and efficient cross-border links between CSDs that perform settlement functions.

[82] Transactions, in certain circumstances, may be settled on a gross basis although through multiple batches during the operating day.

[83] Nominal value date might not necessarily coincide with local settlement date.

Revocation of unsettled payments, transfer instructions, or other obligations

186. An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant. In general, an FMI should prohibit the unilateral revocation of accepted and unsettled payments, transfer instructions, or other obligations after a certain point or time in the settlement day, so as to avoid creating liquidity risks. In all cases, cutoff times and materiality rules for exceptions should be clearly defined. The rules should make clear that changes to operating hours are exceptional and require individual justifications. For example, an FMI may want to permit extensions for reasons connected with the implementation of monetary policy or widespread financial market disruption. If extensions are allowed for participants with operating problems to complete processing, the rules governing the approval and duration of such extensions should be clear to participants.

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Principle 9: Money settlements

An FMI should conduct its money settlements using an account which represents a claim on the central bank where practical and available. If such an account is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.

187. This principle should be reviewed in the context of Principle 8 on settlement finality, Principle 16 on custody and investment risks, and other principles, as appropriate.

Key considerations

1. *An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.*

2. *If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.*

3. *If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.*

4. *If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.*

5. *An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.*

6. *An FMI should neither receive nor pay interest on the accounts that it uses for money settlements. If for any reason the receipt of interest is unavoidable,[84] then the interest received should be channelled to charity.*

Questions by key consideration

Key consideration 1:

Q.9.1.1: How does the FMI conduct money settlements? If the FMI conducts settlement in multiple currencies, how does the FMI conduct money settlement in each currency?

Q.9.1.2: How does an FMI manage its settlement transactions in such a way as to avoid receiving or paying interest?

Q.9.1.3: If the FMI does not settle in central bank money, why is it not used?

Key consideration 2:

Q.9.2.1: If central bank money is not used, how does the FMI assess the credit and liquidity risks of the settlement asset used for money settlement?

Q.9.2.2: If the FMI settles in commercial bank money, how does the FMI select its settlement banks? What are the specific selection criteria the FMI uses?

Key consideration 3:

Q.9.3.1: How does the FMI monitor the settlement banks' adherence to criteria it uses for selection? For example, how does the FMI evaluate the banks' regulation,

[84] For example, because it is required to settle through the central bank, and that bank does not have non-interest-bearing facilities available.

supervision, creditworthiness, capitalisation, access to liquidity and operational reliability?

Q.9.3.2: How does the FMI monitor, manage and limit its credit and liquidity risks arising from the commercial settlement banks? How does the FMI monitor and manage the concentration of credit and liquidity exposures to these banks?

Q.9.3.3: How does the FMI assess its potential losses and liquidity pressures as well as those of its participants if there is a failure of its largest settlement bank?

Key consideration 4:

Q.9.4.1: If an FMI conducts money settlements on its own books, how does it minimise and strictly control its credit and liquidity risks?

Key consideration 5:

Q.9.5.1: Do the FMI's legal agreements with its settlement banks state when transfers occur, that transfers are final when effected, and that funds received are transferable?

Q.9.5.2: Are funds received transferable by the end of the day at the latest? If not, why? Are they transferable intraday? If not, why?

Explanatory note

188. An FMI typically needs to conduct money settlements with or between its participants for a variety of purposes, such as the settlement of individual payment obligations, funding and defunding activities, and the collection and distribution of collateral payments. To conduct such money settlements, an FMI can use an account at the central bank or at a commercial bank. Central bank money is a liability of a central bank, in this case in the form of deposits held at the central bank, which can be used for settlement purposes. Settlement in central bank money typically involves the discharge of settlement obligations on the books of the central bank of issue. Commercial bank money is a liability of a commercial bank, in the form

of deposits held at the commercial bank, which can be used for settlement purposes. Settlement in commercial bank money typically occurs on the books ofa commercial bank. In this model, an FMI typically establishes an account with one or more commercial settlement banks and requires each of its participants to establish an account with one of them. In some cases, the FMI itself can serve as the settlement bank. Money settlements are then effected through accounts on the books of the FMI, which may need to be funded and defunded. An FMI may also use a combination of central bank and commercial bank monies to conduct settlements, for example, by using central bank money for funding and defunding activities and using commercial bank money for the settlement of individual payment obligations.

Credit and liquidity risk in money settlements

189. An FMI and its participants may face credit and liquidity risks from money settlements. Credit risk may arise when a settlement bank has the potential to default on its obligations (e.g. if the settlement bank becomes insolvent). When an FMI settles on its own books, participants face credit risk from the FMI itself. Liquidity risk may arise in money settlements if, after a payment obligation has been settled, participants or the FMI itself are unable to transfer readily their assets at the settlement bank into other liquid assets, such as claims on a central bank.

Central bank money

190. An FMI should conduct its money settlements using central bank money, where practical and available, to avoid credit and liquidity risks. With the use of central bank money, a payment obligation is typically discharged by providing the FMI or its participants with a direct claim on the central bank; that is, the settlement asset is central bank money. Central banks have the lowest credit risk and are the source of liquidity with regard to their currency of issue. Indeed, one of the fundamental purposes of central banks is to provide a safe and liquid settlement asset. The use of central bank money, however, may not always be practical or available. For example, an FMI or its participants may not have direct access to all relevant central bank accounts and payment services. A multicurrency FMI that has access to all relevant central bank accounts and payment services may find that some central bank payment services do not operate, or provide finality, at the times when it needs to make money settlements.

Commercial bank money

191. If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk. An alternative to the use of central bank money is commercial bank money. When settling in commercial bank money, a payment obligation is typically discharged by providing the FMI or its participants with a directclaim on the relevant commercial bank. To conduct settlements in commercial bank money, an FMI and its participants need to establish accounts with at least one commercial bank,and likely hold intraday or overnight balances, or both. The use of commercial bank money to settle payment obligations, however, can create additional credit and liquidity risks for the FMI and its participants. For example, if the commercial bank conducting settlement becomes insolvent, the FMI and its participants may not have immediate access to their settlement funds or ultimately receive the full value of their funds.

192. If an FMI uses a commercial bank for its money settlements, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement bank. For example, an FMI should limit both the probability of being exposed to a commercial settlement bank's failure and limit the potential losses and liquidity pressures to which it would be exposed in the event of such a failure. An FMI should establish and monitor adherence to strict criteria for its commercial settlement banks that take into account, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. A commercial settlement bank should be subject to effective banking regulation and supervision. It should also be creditworthy, be well capitalised, and have ample liquidity from the marketplace or the central bank of issue.

193. In addition, an FMI should take further steps to limit its credit exposures and liquidity pressures by diversifying the risk of a commercial settlement bank failure, where reasonable, through use of multiple commercial settlement banks. In some jurisdictions, however, there may be only one commercial settlement bank that meets appropriate criteria for creditworthiness and operational reliability. Additionally, even with multiple commercial settlement banks, the extent to which risk is actually diversified depends upon the distribution or concentration of participants using different commercial settlement banks and the amounts

owed by those participants.[85] An FMI should monitor and manage the full range and concentration of exposures to its commercial settlement banks and assess its potential losses and liquidity pressures as well as those of its participants in the event that the commercial settlement bank with the largest share of activity were to fail.

Settlement on the books of an FMI

194. If money settlement does not occur in central bank money and the FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks. In such an arrangement, an FMI offers cash accounts to its participants, and a payment or settlement obligation is discharged by providing an FMI's participants with a direct claim on the FMI itself. The credit and liquidity risks associated with a claim on an FMI are therefore directly related to the FMI's overall credit and liquidity risks. One way an FMI could minimise these risks is to limit its activities and operations to clearing and settlement and closely related processes. Further, to settle payment obligations, the FMI could be established as a supervised special-purpose financial institution and limit the provision of cash accounts to only participants.[86] In some cases, an FMI can further mitigate risk by having participants fund and defund their cash accounts at the FMI using central bank money. In such an arrangement, an FMI is able to back the settlements conducted on its own books with balances that it holds in its account at the central bank.

Finality of funds transfers between settlement accounts

195. In settlements involving either central bank or commercial bank money, a critical issue is the timing of the finality of funds transfers. These transfers should be final when effected (see also Principle 1 on legal basis and Principle 8 on settlement finality). To this end, an FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a

[85] The concentration of an FMI's exposure to a commercial settlement bank can be further exacerbated if the commercial settlement bank has multiple roles with respect to the FMI. For example, an FMI may use a particular commercial settlement bank that is also a participant in the FMI for depositing and investing funds, for depositing and transferring securities, and for back-up liquidity resources. See Principle 7 on liquidity risk.

[86] Depending on local laws, these special-purpose institutions would generally be required to have banking licenses and be subject to prudential supervision.

minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks. If an FMI conducts intraday money settlements (e.g. to collect intraday collateral), the arrangement should provide real-time finality or intraday finality at the times when an FMI wishes to effect money settlement.

Avoidance of interest

196. Interest is forbidden by Sharīʿah, and therefore an FMI should ensure that the account through which it settles, whether with the central bank or a commercial bank, does not charge or pay interest. (This does not prohibit earning a return on the funds in that account in a Sharīʿah-compliant way.) If for any reason the FMI is unable to settle except through an interest-bearing account, then any interest earned should be treated as non-Sharīʿah-compliant income and be channelled to charity as approved by the Sharīʿah board that advises the FMI (as provided for in Principle 25).

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Principle 10: Physical deliveries

An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.

197. This principle should be reviewed in the context of Principle 15 on general business risk, Principle 23 on disclosure of rules, key procedures and market data, and other principles, as appropriate.

Key considerations

1. *An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.*
2. *An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.*

Questions by key consideration

Key consideration 1:

Q.10.1.1: Which asset classes does the FMI accept for physical delivery?

Q.10.1.2: How does the FMI define its obligations and responsibilities with respect to the delivery of physical instruments or commodities? How are these responsibilities defined and documented? To whom are these documents disclosed?

Q.10.1.3: How does the FMI engage with its participants to ensure they have an understanding of their obligations and the procedures for effecting physical delivery?

Key consideration 2:

Q.10.2.1: How does the FMI identify the risks and costs associated with storage and delivery of physical instruments or commodities? What risks and costs has the FMI identified?

Q.10.2.2: What processes, procedures and controls does the FMI have to monitor and manage any identified risks and costs associated with storage and delivery of physical instruments or commodities?

Q.10.2.3: If an FMI can match participants for delivery and receipt, under what circumstances can it do so, and what are the associated rules and procedures? Are the legal obligations for delivery clearly expressed in the rules and associated agreements?

Q.10.2.4: How does the FMI monitor its participants' delivery preferences and, to the extent practicable, ensure that its participants have the necessary systems and resources to be able to fulfil their physical delivery obligations?

Explanatory note

198. An FMI may settle transactions using physical delivery, which is the delivery of an asset, such as an instrument or a commodity, in physical form.[87] An FMI that provides physical settlement should have rules that clearly state its obligations with respect to the delivery of physical instruments or commodities.[88] In addition, an FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of such physical instruments and commodities.

[87] Examples of physical instruments that may be covered under this principle include securities, commercial paper, and other debt instruments that are issued in paper form, which should all be Sharī'ah-compliant.

[88] Immobilised and dematerialised securities, which represent the normal market practice, are covered in Principle 11 on CSDs.

Rules that state the FMI's obligations

199. An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities. The obligations that an FMI may assume with respect to physical deliveries vary based on the types of assets that the FMI settles. An FMI should clearly state which asset classes it accepts for physical delivery and the procedures surrounding the delivery of each. An FMI also should clearly state whether its obligation is to make or receive physical deliveries or to indemnify participants for losses incurred in the delivery process. Clear rules on physical deliveries enable the FMI and its participants to take the appropriate steps to mitigate the risks posed by such physical deliveries. An FMI should engage with its participants to ensure that they have an understanding of their obligations and the procedures for effecting physical delivery.

Risks of storage and delivery

200. An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities. Issues relating to delivery may arise, for example, during a crisis (e.g. COVID-19), and an FMI may face restrictions by a relevant authority which could affect its physical delivery obligations due, for example, to a lockdown/movement control order. An FMI should plan for and manage physical deliveries by establishing definitions for acceptable physical instruments or commodities, the appropriateness of alternative delivery locations or assets, rules for warehouse operations, and the timing of delivery, when relevant. If an FMI is responsible for the warehousing and transportation of a commodity, it should make arrangements that take into account the commodity's particular characteristics (e.g. storage under specific conditions, such as an appropriate temperature and humidity for perishables).

201. An FMI should have appropriate processes, procedures, and controls to manage the risks of storing and delivering physical assets, such as the risk of theft, loss, counterfeiting, or deterioration of assets. An FMI's policies and procedures should ensure that the FMI's record of physical assets accurately reflects its holdings of assets – for example, by separating duties between handling physical assets and maintaining records. An FMI also should have appropriate employment policies and procedures for personnel that handle physical assets and should include appropriate pre-employment checks and training. In addition, an FMI should consider other measures, such as *takāful* coverage and random storage facility audits, to mitigate its storage and delivery risks (other than principal risk).

Matching participants for delivery and receipt

202. In some instances, an FMI serving a commodity market can reduce its risks associated with the physical storage and delivery of commodities by matching participants that have delivery obligations with those due to receive the commodities, thereby removing itself from direct involvement in the storage and delivery process. In such instances, the legal obligations for delivery should be clearly expressed in the rules, including default rules, and any related agreements. In particular, an FMI should be clear whether the receiving participant should seek compensation from the FMI or the delivering participant in the event of a loss. Additionally, an FMI holding collateral should not release the collateral of the matched participants until it confirms that both have fulfilled their respective obligations. An FMI should also monitor its participants' performance and, to the extent practicable, ensure that its participants have the necessary systems and resources to be able to fulfil their physical delivery obligations.

Central securities depositories and exchange-of-value settlement systems

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Principle 11: Central securities depositories

A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.

203. In reviewing this principle, where an entity legally defined as a CSD or an SSS does not hold or facilitate the holding of assets or collateral owned by its participants, the CSD or SSS in general would not be required to have arrangements to manage the safekeeping of such assets or collateral. This principle should be reviewed in the context of Principle 17 on operational risk, Principle 20 on FMI links, and other principles, as appropriate.

Key considerations

1. *A CSD should have appropriate rules, procedures, and controls, including robust accounting practices, to safeguard the rights of securities issuers and holders, prevent the unauthorised creation or deletion of securities, and conduct periodic and at least daily reconciliation of securities issues it maintains.*

2. *A CSD should prohibit overdrafts and debit balances in securities accounts.*

3. *A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry. Where appropriate, a CSD should provide incentives to immobilise or dematerialise securities.*

4. *A CSD should protect assets against custody risk through appropriate rules and procedures consistent with its legal framework.*

5. *A CSD should employ a robust system that ensures segregation between the CSD's own assets and the securities of its participants and segregation among the securities of participants. Where supported by the legal framework, the CSD should also support operationally the segregation of securities belonging to a participant's customers on the participant's books and facilitate the transfer of customer holdings.*

6. *A CSD should identify, measure, monitor, and manage its risks from other activities that it may perform; additional tools may be necessary in order to address these risks.*

Questions by key consideration

Key consideration 1:

Safeguarding the rights of securities issuers and holders

Q.11.1.1: How are the rights of securities issuers and holders safeguarded by the rules, procedures and controls of the CSD?

Q.11.1.2: How do the CSD's rules, procedures and controls ensure that the securities it holds on behalf of participants are appropriately accounted for on its books and protected from risks associated with the other services the CSD may provide?

Q.11.1.3: How does the CSD ensure that it has robust accounting practices? Do audits review whether there are sufficient securities to satisfy customer rights? How frequently are end-to-end audits conducted to examine the procedures and internal controls used in the safekeeping of securities?

Prevention of the unauthorised creation or deletion of securities

Q.11.1.4: What are the CSD's internal procedures to authorise the creation and deletion of securities? What are the CSD's internal controls to prevent the unauthorised creation and deletion of securities?

Periodic reconciliation of securities issues

Q.11.1.5: Does the CSD conduct periodic and at least daily reconciliation of the totals of securities issues in the CSD for each issuer (or its issuing agent)? How

does the CSD ensure that the total number of securities recorded in the CSD for a particular issue is equal to the amount of securities of that issue held on the CSD's books?

Q.11.1.6: If the CSD is not the official registrar of the issues held on its books, how does the CSD reconcile its records with the official registrar?

Key consideration 2:

Q.11.2.1: How does the CSD prevent overdrafts and debit balances in securities accounts?

Key consideration 3:

Q.11.3.1: Are securities issued or maintained in a dematerialised form? What percentage of securities is dematerialised, and what percentage of the total volume of transactions applies to these securities?

Q.11.3.2: If securities are issued as a physical certificate, is it possible to immobilise them and allow their holding and transfer in a book-entry system? What percentage of securities is immobilised, and what percentage of the total volume of transactions applies to immobilised securities?

Q11.3.3: What incentives, if any, does the CSD provide to immobilise or dematerialise securities?

Key consideration 4:

Q.11.4.1: How do the CSD's rules and procedures protect assets against custody risk, including the risk of loss because of the CSD's negligence, misuse of assets, fraud, poor administration, inadequate record-keeping or failure to protect participants' interests in their securities?

Q.11.4.2: How has the CSD determined that those rules and procedures are consistent with the legal framework?

Q.11.4.3: What other methods, if any, does the CSD employ to protect its participants against misappropriation, destruction and theft of securities (e.g. *takāful* or other compensation schemes)?

Key consideration 5:

Q.11.5.1: What segregation arrangements are in place at the CSD? How does the CSD ensure segregation between its own assets and the securities of its participants? How does the CSD ensure segregation among the securities of participants?

Q.11.5.2: Where supported by the legal framework, how does the CSD support the operational segregation of securities belonging to participants' customers from the participants' book? How does the CSD facilitate the transfer from these customers' accounts to another participant?

Key consideration 6:

Q.11.6.1: Does the CSD provide services other than central safekeeping and administration of securities and settlement? If so, what services? What are the arrangements in place to ensure that such services comply with Sharīʿah requirements?

Q.11.6.2: If the CSD provides services other than central safekeeping and administration of securities and settlement, how does it identify the risks associated with those activities, including potential credit and liquidity risks? How does it measure, monitor and manage these risks, including legally separating services other than safekeeping and administration of securities where necessary?

Explanatory note

204. A CSD is an entity that provides securities accounts and, in many countries, operates an SSS. A CSD also provides central safekeeping and asset services, which may include the administration of corporate actions and redemptions, and plays an important role in helping

to ensure the integrity of securities issues.[89] Securities can be held at the CSD either in physical (but immobilised) form or in dematerialised form (i.e. as electronic records). The precise activities of a CSD vary based on its jurisdiction and market practices.A CSD, for example, may be the official securities registrar and maintain the definitive record of legal ownership for a security; however, in some cases, another entity may serve as the official securities registrar. Further, the activities of a CSD may vary depending on whether it operates in a jurisdiction with a direct or indirect holding arrangement or a combination of both.[90] A CSD should have clear and comprehensive rules and procedures to ensure that the securities it holds on behalf of its participants are appropriately accounted for on its books and protected from risks associated with the other services that the CSD may provide.

Rules, procedures, and controls to safeguard the integrity of securities issues

205. The preservation of the rights of issuers and holders of securities is essential for the orderly functioning of a securities market. Therefore, a CSD should employ appropriate rules, procedures, and controls to safeguard the rights of securities issuers and holders, prevent the unauthorised creation or deletion of securities, and conduct periodic and at least daily reconciliation of the securities issues that it maintains. A CSD should, in particular, maintain robust accounting practices and perform end-to-end auditing to verify that its records are accurate and provide a complete accounting of its securities issues. If a CSD records the issuance of securities (alone or in conjunction with other entities), it should verify and account for the initial issuance of securities and ensure that newly issued securities are delivered in a timely manner. To further safeguard the integrity of the securities issues, a CSD should conduct periodic and at least daily reconciliation of the totals of securities issues in the CSD for each issuer (or its issuing agent), and ensure that the total number of securities recorded in the CSD for a particular issue is equal to the amount of securities of that issue held on the CSD's books. Reconciliation may require coordination with other entities if the CSD does not

[89] Where an entity legally defined as a CSD or an SSS does not hold or facilitate the holding of assets or collateral owned by their participants, the CSD or SSS in general would not be required to have arrangements to manage the safekeeping of such assets or collateral.

[90] In a direct holding system, each beneficial or direct owner of the security is known to the CSD or the issuer. In some countries, the use of direct holding systems is required by law. Alternatively, an indirect holding system employs a multi-tiered arrangement for the custody and transfer of ownership of securities (or the transfer of similar interests therein) in which investors are identified only at the level of their custodian or intermediary. In either system, the shareholder list may be maintained by the issuer, CSD, securities registrar, or transfer agent.

(or does not exclusively) record the issuance of the security or is not the official registrar of the security. For instance, if the issuer (or its issuing agent) is the only entity that can verify the total amount of an individual issue, it is important that the CSD and the issuer cooperate closely to ensure that the securities in circulation in a system correspond to the volume issued into that system. If the CSD is not the official securities registrar for the securities issuer, reconciliation with the official securities registrar should be required.

Overdrafts and debit balances in securities accounts

206. A CSD should prohibit overdrafts and debit balances in securities accounts to avoid credit risk and reduce the potential for the creation of securities. If a CSD were to allow overdrafts or a debit balance in a participant's securities account in order to credit another participant's securities account, a CSD would effectively be creating securities and would affect the integrity of the securities issue.

Immobilisation and dematerialisation

207. A CSD can maintain securities in physical form or dematerialised form.[91] Securities held in physical form may be transferred via physical delivery or immobilised and transferred via book entry.[92] The safekeeping and transferring of securities in physical form, however, creates additional risks and costs, such as the risk of destruction or theft of certificates, increased processing costs, and increased time to clear and settle securities transactions. By immobilising securities and transferring them via book entry, a CSD can improve efficiency through increased automation and reduce the risk of errors and delays in processing.[93] Dematerialising securities also eliminates the risk of destruction or theft of certificates. A CSD should therefore maintain securities in an immobilised or dematerialised form and transfer securities via book entry.[94] To facilitate the immobilisation of all physical securities of

[91] Dematerialisation involves the elimination of physical certificates or documents of title that represent ownership of securities so that securities exist only as accounting records.

[92] Immobilisation involves concentrating the location of securities in a depository and transferring ownership by book entry.

[93] Improved efficiency through book-entry settlement also may support the development of more-liquid securities markets.

[94] Book-entry transfers also facilitate the settlement of securities through a DvP mechanism, thereby reducing or eliminating principal risk in settlement (see also Principle 12 on exchange-of-value settlement systems).

a particular issue, a global note representing the whole issue can be issued. In certain cases, however, immobilisation or dematerialisation within a CSD may not be legally possible or practicable. Legal requirements, for example, may limit the possible implementation or extent of immobilisation and dematerialisation. In such cases, a CSD should provide incentives to immobilise or dematerialise securities.[95]

Protection of assets

208. A CSD should protect assets against custody risk, including the risk of loss because of the CSD's negligence, misuse of assets, fraud, poor administration, inadequate record-keeping, or failure to protect a participant's interests in securities or because of the CSD's insolvency or claims by the CSD's creditors. A CSD should have rules and procedures consistent with its legal framework and robust internal controls to achieve these objectives.[96] Where appropriate, a CSD should consider takaful or other compensation schemes to protect participants against misappropriation, destruction, and theft of securities.

209. A CSD should employ a robust system that ensures the segregation of assets belonging to the CSD from the securities belonging to its participants. In addition, the CSD should segregate participants' securities from those of other participants through the provision of separate accounts. While the title to securities is typically held in a CSD, often the beneficial owner, or the owner depending on the legal framework, of the securities does not participate directly in the system. Rather, the owner establishes relationships with CSD participants (or other intermediaries) that provide safekeeping and administrative services related to the holding and transfer of securities on behalf of customers. Where supported by the legal framework, a CSD also should support operationally the segregation of securities belonging to a participant's customers on the participant's books and facilitate the transfer of customer holdings to another participant.[97] Where relevant, the segregation of accounts typically helps

[95] In addition, the relevant authorities will have a role in providing the necessary framework to support immobilisation or dematerialisation.

[96] The relevant authorities will have a role in providing the necessary framework to protect the CSD's participants' and their customers' assets.

[97] The customer's rights and interests to the securities held by the participant or the CSD will depend upon the applicable legal framework. In some jurisdictions, a CSD may be required to maintain records that would facilitate the identification of customer securities regardless of the type of holding system in effect.

provide appropriate protection against the claims of a CSD's creditors or the claims of the creditors of a participant in the event of its insolvency.

Other activities

210. If a CSD provides services other than central safekeeping and administration of securities, it should identify, measure, monitor, and manage the risks associated with those activities, particularly credit and liquidity risks, consistent with the respective principles in this report. Additional tools may be necessary to address these risks, including the need for the FMI to separate legally the other activities. For example, a CSD that operates an SSS may provide Sharīʿah-compliant repurchase agreements in which securities are used to guarantee the debt (see Principle 7 on liquidity risk) to help facilitate timely settlement and reduce settlement fails.

PS	CSD	SSS	CCP	TR
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Principle 12: Exchange-of-value settlement systems

If an FMI settles transactions that involve the settlement of two linked obligations (e.g. securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.

211. This principle should be reviewed in the context of Principle 4 on credit risk, Principle 7 on liquidity risk, Principle 8 on settlement finality, and other principles, as appropriate.

Key consideration

1. *An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.*

Questions by key consideration

Key consideration 1:

Q.12.1.1: How do the FMI's legal, contractual, technical and risk management frameworks ensure that the final settlement of relevant financial instruments eliminates principal risk? What procedures ensure that the final settlement of one obligation occurs if and only if the final settlement of a linked obligation also occurs?

Q.12.1.2: How are the linked obligations settled – on a gross basis (trade by trade) or on a net basis?

Q.12.1.3: Is the finality of settlement of linked obligations simultaneous? If not, what is the timing of finality for both obligations? Is the length of time between the blocking and final settlement of both obligations minimised? Are blocked assets protected from a claim by a third party?

Q.12.1.4: In the case of a CCP, does the CCP rely on the DvP or PvP services provided by another FMI, such as an SSS or payment system? If so, how would the CCP characterise the level of its reliance on such services? What contractual relationship does the CCP have with the SSS or payment system to ensure that final settlement of one obligation occurs only when the final settlement of any linked obligations occurs?

Explanatory note

212. The settlement of a financial transaction by an FMI may involve the settlement of two linked obligations, such as the delivery of securities against payment of cash or securities or the delivery of one currency against delivery of another currency.[98] In this context, principal risk may be created when one obligation is settled, but the other obligation is not (e.g. the securities are delivered but no cash payment is received). Because this principal risk involves the full value of the transaction, substantial credit losses as well as substantial liquidity pressures may result from the default of a counterparty or, more generally, the failure to complete the settlement of both linked obligations. Further, a settlement default could result in high replacement costs (i.e. the unrealised gain on the unsettled contract or the cost of replacing the original contract at market prices that may be changing rapidly during periods of stress). An FMI should eliminate or mitigate these risks through the use of a DvP, DvD, or PvP settlement mechanism.[99]

Linking final settlement of obligations

213. An FMI that is an exchange-of-value settlement system should eliminate principal risk by linking the final settlement of one obligation to the final settlement of the other through an appropriate DvP, DvD, or PvP settlement mechanism (see also Principle 4 on credit risk, Principle 7 on liquidity risk, and Principle 8 on settlement finality). DvP, DvD, and PvP

[98] In some cases, the settlement of a transaction can be free of payment, for example, for the purposes of pledging collateral and repositioning securities. The settlement of a transaction may also involve more than two linked obligations, for example, for the purposes of some collateral substitutions where there are multiple securities. These cases are not inconsistent with this principle.

[99] While DvP, DvD, and PvP settlement mechanisms eliminate principal risk, they do not eliminate the risk that the failure of a participant could result in systemic disruptions, including liquidity dislocations.

settlement mechanisms eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation occurs. If an FMI effects settlement using a DvP, DvD, or PvP settlement mechanism, it should settle a high percentage of obligations through that mechanism. In the securities market, for example, a DvP settlement mechanism is a mechanism that links a securities transfer and a funds transfer in such a way as to ensure that delivery occurs if and only if the corresponding payment occurs.[100] DvP can and should be achieved for both the primary and secondary markets. The settlement of two obligations can be achieved in several ways and varies by how trades or obligations are settled, either on a gross basis (trade-by-trade) or on a net basis, and the timing of when finality occurs.

Models of gross or net settlement of obligations

214. The final settlement of two linked obligations can be achieved either on a gross basis or on a net basis. For example, an SSS can settle the transfers of both securities and funds on a gross basis throughout the settlement day. Alternatively, an SSS can settle securities transfers on a gross basis throughout the day but settle funds transfers on a net basis at the end of the day or at certain times during the day. An SSS can also settle both securities and funds transfers on a net basis at the end of the day or at certain times during the day. Regardless of whether an FMI settles on a gross or net basis, the legal, contractual, technical, and risk management framework should ensure that the settlement of an obligation is final if and only if the settlement of the corresponding obligation is final.

Timing of settlement

215. DvP, DvD, and PvP can be achieved through different timing arrangements. Strictly speaking, DvP, DvD, and PvP do not require a simultaneous settlement of obligations. In some cases, settlement of one obligation could follow the settlement of the other. For example, when an SSS does not itself provide cash accounts for settlement, it may first block the underlying

[100] Similarly, a PvP settlement mechanism is a mechanism which ensures that the final transfer of a payment in one currency occurs if and only if the final transfer of a payment in another currency or currencies takes place. A DvD settlement mechanism is a securities settlement mechanism which links two or more securities transfers in such a way as to ensure that delivery of one security occurs if and only if the corresponding delivery of the other security or securities occurs.

securities in the account of the seller.[101] The SSS may then request a transfer of funds from the buyer to the seller at the settlement bank for funds transfers. The securities are delivered to the buyer or its custodian if and only if the SSS receives confirmation of settlement of the cash leg from the settlement bank. In such DvP arrangements, however,the length of time between the blocking of securities, the settling of cash, and the subsequent release and delivery of the blocked securities should be minimised.[102] Further, blocked securities must not be subject to a claim by a third party (e.g. other creditors, tax authorities, or even the SSS itself) because these claims would give rise to principal risk.

[101] In this context, DvP could be achieved through a link between an SSS and a payment system. The SSS settles the securities leg of the transaction while the payment system settles the cash leg. However, in the context of these principles this arrangement is not considered an FMI link, but a DvP system.

[102] An SSS that settles securities transactions on a net basis with an end-of-day finality arrangement could meet this requirement by providing a mechanism that allows intraday finality.

Default management

PS	CSD	SSS	CCP	TR
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Principle 13: Participant-default rules and procedures

An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.

216. Because of the extensive interactions between the default management principles as they apply to CCPs, this principle needs to be reviewed in the context of Principle 14 on segregation and portability. This principle should also be reviewed in the context of Principle 4 on credit risk, Principle 7 on liquidity risk, Principle 23 on disclosure of rules, key procedures and market data, and other principles, as appropriate.

Key considerations

1. *An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.*

2. *An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.*

3. *An FMI should publicly disclose key aspects of its default rules and procedures.*

4. *An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.*

Questions by key consideration

Key consideration 1:

Participant default rules and procedures

Q.13.1.1: Do the FMI's rules and procedures clearly define an event of default (both a financial and an operational default of a participant) and the method for identifying a default? How are these events defined?

Q.13.1.2: How do the FMI's rules and procedures address the following key aspects of a participant default:

a) the actions that the FMI can take when a default is declared;

b) the extent to which the actions are automatic or discretionary;

c) changes to normal settlement practices;

d) the management of transactions at different stages of processing;

e) the expected treatment of proprietary and customer transactions and accounts;

f) the probable sequencing of actions;

g) the roles, obligations and responsibilities of the various parties, including non-defaulting participants; and

h) the existence of other mechanisms that may be activated to contain the impact of a default?

Use of financial resources

Q.13.1.3: How do the FMI's rules and procedures allow the FMI to promptly use any financial resources that it maintains for covering losses and containing liquidity pressures arising from default, including liquidity facilities?

Q.13.1.4: How do the FMI's rules and procedures address the order in which the financial resources can be used?

Q.13.1.5: How do the FMI's rules and procedures address the replenishment of resources following a default?

Key consideration 2:

Q.13.2.1: Does the FMI's management have internal plans that clearly delineate the roles and responsibilities for addressing a default? What are these plans?

Q.13.2.2: What type of communication procedures does the FMI have in order to reach in a timely manner all relevant stakeholders, including regulators, supervisors and overseers?

Q.13.2.3: How frequently are the internal plans to address a default reviewed? What is the governance arrangement around these plans?

Key consideration 3:

Q.13.3.1: How are the key aspects of the FMI's participant default rules and procedures made publicly available? How do they address:

a) the circumstances in which action may be taken;

b) who may take those actions;

c) the scope of the actions which may be taken, including the treatment of both proprietary and customer positions, funds and assets;

d) the mechanisms to address an FMI's obligations to non-defaulting participants; and

e) where direct relationships exist with participants' customers, the mechanisms to help address the defaulting participant's obligations to its customers?

Key consideration 4:

Q.13.4.1: How does the FMI engage with its participants and other relevant stakeholders in the testing and review of its participant default procedures?

How frequently does it conduct such tests and reviews? How are these tests results used? To what extent are the results shared with the board, risk committee and relevant authorities?

Q.13.4.2: What range of potential participant default scenarios and procedures do these tests cover? To what extent does the FMI test the implementation of the resolution regime for its participants?

Explanatory note

217. Participant-default rules and procedures facilitate the continued functioning of an FMI in the event that a participant fails to meet its obligations. These rules and procedures help limit the potential for the effects of a participant's failure to spread to other participants and undermine the viability of the FMI. Key objectives of default rules and procedures should include: (a) ensuring timely completion of settlement, even in extreme but plausible market conditions; (b) minimising losses for the FMI and for non-defaulting participants; (c) limiting disruptions to the market; (d) providing a clear framework for accessing FMI liquidity facilities as needed; and (e) managing and closing out the defaulting participant's positions and liquidating any applicable collateral in a prudent and orderly manner. In some instances, managing a participant default may involve hedging open positions, funding collateral so that the positions can be closed out over time, or both. An FMI may also decide to auction or allocate open positions to its participants. To the extent consistent with these objectives, an FMI should allow non-defaulting participants to continue to manage their positions as normal.

Rules and procedures

218. An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations to non-defaulting participants in the event of a participant default. An FMI should explain clearly in its rules and procedures what circumstances constitute a participant

default, addressing both financial and operational defaults.[103] An FMI should describe the method for identifying a default. In particular, it should specify whether a declaration of default is automatic or discretionary, and if discretionary, which person or group shall exercise that discretion. Key aspects to be considered in designing the rules and procedures include: (a) the actions that an FMI can take when a default is declared; (b) the extent to which such actions are automatic or discretionary; (c) potential changes to the normal settlement practices, should these changes be necessary in extreme circumstances, to ensure timely settlement; (d) the management of transactions at different stages of processing; (e) the expected treatment of proprietary and customer transactions and accounts; (f) the probable sequencing of actions; (g) the roles, obligations, and responsibilities of the various parties, including non-defaulting participants; and (h) the existence of other mechanisms that may be activated to contain the impact of a default. An FMI should involve its participants, authorities, and other relevant stakeholders in developing its default rules and procedures (see Principle 2 on governance and Principle 25 on Sharī'ah governance).

Use and sequencing of financial resources

219. An FMI's default rules and procedures should enable the FMI to take timely action to contain losses and liquidity pressures before, at, and after the point of participant default (see also Principle 4 on credit risk and Principle 7 on liquidity risk). Specifically, an FMI's rules and procedures should allow the FMI to use promptly any financial resources that it maintains for covering losses and containing liquidity pressures arising from default, including liquidity facilities. The rules of the FMI should specify the order in which different types of resources will be used. This information enables participants to assess their potential future exposures from using the FMI's services. Typically, an FMI should first use assets provided by the defaulting participant, such as collateral or other collateral, to provide incentives for participants to manage prudently the risks, particularly credit risk, they pose to an FMI.[104] The application of previously provided collateral should not be subject to prevention, stay, or reversal under applicable law and the rules of the FMI. An FMI should also have a credible

[103] An operational default occurs when a participant is not able to meet its obligations due to an operational problem, such as a failure in information technology systems.

[104] The defaulting participant's assets do not include segregated customer collateral; such segregated collateral should not be used to cover losses resulting from a participant default, except in the case of a potential close out of segregated customer positions. See Principle 14 on segregation and portability.

and explicit plan for replenishing its resources over an appropriate time horizon following a participant default so that it can continue to operate in a safe and sound manner. In particular, the FMI's rules and procedures should define the obligations of the non-defaulting participants to replenish the financial resources depleted during a default so that the time horizon of such replenishment is anticipated by non-defaulting participants without any disruptive effects.[105]

Proprietary and customer positions

220. A CCP should have rules and procedures to facilitate the prompt close out ortransfer of a defaulting participant's proprietary and customer positions. Typically, the longer these positions remain open on the books of the CCP, the larger the CCP's potential credit exposures resulting from changes in market prices or other factors will be. A CCP should have the ability to apply the proceeds of liquidation, along with other funds and assets of the defaulting participant, to meet the defaulting participant's obligations. It is critical that a CCP has the authority to act promptly to contain its exposure, while having regard for overall market effects, such as sharp declines in market prices. A CCP should have the information, resources, and tools to close out positions promptly. In circumstances where prompt close out is not practicable, a CCP should have the tools to hedge positions as an interim risk-management technique. In some cases, a CCP may use seconded personnel from non-defaulting participants to assist in the close-out or hedging process. The CCP's rules and procedures should clearly state the scope of duties and term of service expected from seconded personnel. In other cases, the CCP may elect to auction positions or portfolios to the market. The CCP's rules and procedures should clearly state the scope for such action, and any participant obligations with regard to such auctions should be clearly set out. The close out of positions should not be subject to prevention, stay, or reversal under applicable law and the rules of the FMI.

Management discretion

221. An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in the rules. Management

[105] Depending on the structure, a late payment fee could be imposed to ensure that the financial resources are replenished in a timely manner. Such a fee must be channelled to charity.

should ensure that the FMI has the operational capacity, including sufficient well-trained personnel, to implement its procedures in a timely manner. An FMI's rules and procedures should outline examples of when management discretion may be appropriate and should include arrangements to minimise any potential conflicts of interests. Management should also have internal plans that clearly delineate the roles and responsibilities for addressing a default and provide training and guidance to its personnel on how the procedures should be implemented. These plans should address documentation, information needs, and coordination when more than one FMI or authority is involved. In addition, timely communication with stakeholders, in particular with relevant authorities, is of critical importance. The FMI, to the extent permitted, should clearly convey to affected stakeholders information that would help them to manage their own risks. The internal plan should be reviewed by management and the relevant board committees at least annually or after any significant changes to the FMI's arrangements.

222. During a crisis, as part of the FMI's risk management activities, an FMI should maintain frequent contact with its participants to understand how they are being impacted by the crisis and are managing its adverse effects. An FMI should be aware of such impacts on its participants, as it would need to recalibrate its risk assessment accordingly.

Public disclosure of key aspects of default rules and procedures

223. To provide certainty and predictability regarding the measures that an FMI may take in a default event, an FMI should publicly disclose key aspects of its default rules and procedures, including: (a) the circumstances in which action may be taken; (b) who may take those actions; (c) the scope of the actions which may be taken, including the treatment of both proprietary and customer positions, funds, and other assets; (d) the mechanisms to address an FMI's obligations to non-defaulting participants; and (e) where direct relationships exist with participants' customers, the mechanisms to help address the defaulting participant's obligations to its customers. This transparency fosters the orderly handling of defaults, enables participants to understand their obligations to the FMI and to their customers, and gives market participants the information they need to make informed decisions about their activities in the market. An FMI should ensure that its participants and their customers, as well as the public, have appropriate access to the FMI's default rules and procedures and should promote their understanding of those procedures in order to foster confidence in the market in the event of a participant default.

Periodic testing and review of default procedures

224. An FMI should involve its participants and other stakeholders in the testing and review of its default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective. The periodic testing and review of default procedures is important to help the FMI and its participants understand fully the procedures and to identify any lack of clarity in, or discretion allowed by, the rules and procedures. Such tests should include all relevant parties, or an appropriate subset, that would likely be involved in the default procedures, such as members of the appropriate board committees, participants, linked or interdependent FMIs, relevant authorities, and any related service providers. This is particularly important where an FMI relies on non-defaulting participants or third parties to assist in the close-out process and where the default procedures have never been tested by an actual default. The results of these tests and reviews should be shared with the FMI's board of directors, risk committee, and relevant authorities.

225. Furthermore, part of an FMI's participant-default testing should include the implementation of the resolution regime for an FMI's participants, as relevant. An FMI should be able to take all appropriate steps to address the resolution of a participant. Specifically, the FMI, or if applicable a resolution authority, should be able to transfer a defaulting participant's open positions and customer accounts to a receiver, third party, or bridge financial company.

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Principle 14: Segregation and portability

A CCP should have rules and procedures that enable the segregation and portability of positions of a participant's customers and the collateral provided to the CCP with respect to those positions.

226. Because of the extensive interactions between the default management principles as they apply to CCPs, this principle should be reviewed in the context of Principle 13 on participant default rules. This principle should also be reviewed in the context of Principle 19 on tiered participation arrangements, Principle 23 on disclosure of rules, key procedures and market data, and other principles, as appropriate.

Key considerations

1. *A CCP should, at a minimum, have segregation and portability arrangements that effectively protect a participant's customers' positions and related collateral from the default or insolvency of that participant. If the CCP additionally offers protection of such customer positions and collateral against the concurrent default of the participant and a fellow customer, the CCP should take steps to ensure that such protection is effective.*

2. *A CCP should employ an account structure that enables it readily to identify positions of a participant's customers and to segregate related collateral. A CCP should maintain customer positions and collateral in individual customer accounts or in omnibus customer accounts.*

3. *A CCP should structure its portability arrangements in a way that makes it highly likely that the positions and collateral of a defaulting participant's customers will be transferred to one or more other participants.*

4. *A CCP should disclose its rules, policies, and procedures relating to the segregation and portability of a participant's customers' positions and related collateral. In particular, the CCP should disclose whether customer collateral is protected on an individual or omnibus basis. In addition, a CCP should disclose any constraints, such*

as legal or operational constraints, that may impair its ability to segregate or port a participant's customers' positions and related collateral.

Questions by key consideration

Key consideration 1:

Customer protection from participant default

Q.14.1.1: What segregation arrangements does the CCP have in place to effectively protect a participant's customers' positions and related collateral from the default or insolvency of that participant?

Q.14.1.2: What are the CCP's portability arrangements?

Q.14.1.3: If the CCP serves a cash market and does not provide segregation arrangements, how does the CCP achieve protection of customers' assets? Has the CCP evaluated whether the applicable legal or regulatory framework achieves the same degree of protection and efficiency for customers that would otherwise be achieved by segregation and portability arrangements?

Customer protection from participant and fellow customer default

Q.14.1.4: If the CCP offers additional protection to customers to protect their positions and collateral against the concurrent default of the participant and a fellow customer, how does the CCP ensure that such protection is effective?

Legal basis

Q.14.1.5: What evidence is there that the legal basis provides a high degree of assurance that it will support the CCP's arrangements to protect and transfer the positions and collateral of a participant's customers?

Q.14.1.6: What analysis has the CCP conducted regarding the enforceability of its customer segregation and portability arrangements, including with respect to any foreign or remote participants? In particular, which foreign laws has the

CCP determined to be relevant to its ability to segregate or transfer customer positions and collateral? How have any identified issues been addressed?

Key consideration 2:

Q.14.2.1: How does the CCP segregate a participant's customers' positions and related collateral from the participant's positions and collateral? What type of account structure (individual or omnibus) does the CCP use for the positions and related collateral of participants' customers? What is the rationale for this choice?

Q.14.2.2: Where a CCP uses omnibus accounts within a dual system, how does it segregate the two businesses from each other?

Q.14.2.3: If the CCP (or its custodians) holds collateral supporting customers' positions, what does this collateral cover (e.g. initial collateral or variation collateral requirements)?

Q.14.2.4: Does the CCP rely on the participant's records containing the sub-accounting for individual customers to ascertain each customer's interest? If so, how does the CCP ensure that it has access to this information? Is customer collateral obtained by the CCP from its participants collected on a gross or net basis? To what extent is a customer's collateral exposed to "fellow customer risk"?

Key consideration 3:

Q.14.3.1: How do the CCP's portability arrangements make it highly likely that the positions and collateral of a defaulting participant's customers will be transferred to one or more other participants?

Q.14.3.2: How does the CCP obtain the consent of the participant(s) to which positions and collateral are to be ported? Are the consent procedures set out in the CCP's rules, policies or procedures? If so, please describe them. If there are any exceptions, how are they disclosed?

Key consideration 4:

Q.14.4.1: How does the CCP disclose its segregation and portability arrangements? Does the disclosure include whether a participant's customers' collateral is protected on an individual or omnibus basis?

Q.14.4.2: Where and how are the risks, costs and uncertainties associated with the CCP's segregation and portability arrangements identified and disclosed? How does the CCP disclose any constraints (such as legal or operational) that may impair the CCP's ability to fully segregate or port a participant's customers' positions and collateral?

Explanatory note

227. Effective segregation and portability of a participant's customers' positions and collateral depend not only on the measures taken by a CCP itself but also on applicable legal frameworks, including those in foreign jurisdictions in the case of remote participants. Effective segregation and portability also depend on measures taken by other parties, for example, where customers post additional collateral to the participant.[106]

Legal framework

228. In order to achieve fully the benefits of segregation and portability, the legal framework applicable to the CCP should support its arrangements to protect and transfer the positions and collateral of a participant's customers.[107] The legal framework will influence how the segregation and portability arrangements are designed and what benefits can be achieved. The relevant legal framework will vary depending upon many factors, including the participant's legal form of organisation, the manner in which collateral is provided (e.g. security

[106] Participants may collect excess collateral from their customers, beyond that which is required by and provided to the CCP. This excess collateral may be held by the participant or its custodian and outside of the segregation and portability regime in effect at the CCP.

[107] For example, portability arrangements could be undermined if applicable insolvency laws do not protect the transfer of customer positions and collateral from avoidance ("clawback") by the participant's insolvency officer. Also, in some jurisdictions, it may not be possible to segregate cash.

interest, title transfer, or full ownership right), and the types of assets (e.g. cash or securities) provided as collateral. Therefore, it is not possible to design a single model appropriate for all CCPs across all jurisdictions. However, a CCP shouldstructure its segregation and portability arrangements (including applicable rules) in a manner that protects the interests of a participant's customers and achieves a high degree of legal certainty under applicable law. A CCP should also consider potential conflict of laws when designing its arrangements. In particular, the CCP's rules and procedures that set out its segregation and portability arrangements should avoid any potential conflict with applicable legal or regulatory requirements.

Alternate approach for CCPs serving certain cash markets

229. In certain jurisdictions, cash market CCPs operate in legal regimes that facilitate segregation and portability to achieve protection of customer assets by alternate means that offer the same degree of protection as the approach required by this principle. Features of these regimes are that if a participant fails, (a) the customer positions can be identified timely, (b) customers will be protected by an investor protection scheme designed to move customer accounts from the failed or failing participant to another participant in a timely manner, and (c) customer assets can be restored.[108] In these cases, the CCP and relevant authorities for these particular cash markets should evaluate whether the applicable legal or regulatory framework achieves the same degree of protection and efficiency (see Principle 21 on efficiency and effectiveness) for customers that would otherwise be achieved by segregation and portability arrangements at the CCP level described in Principle 14.

Customer account structures

230. The segregation and portability principle is particularly relevant for CCPs that clear positions and hold collateral belonging to customers of a participant. This clearing structure allows customers (such as buy-side firms) that are not direct participants of a CCP to obtain

[108] For example, domestic law subjects participants to explicit and comprehensive financial responsibility or customer protection requirements that obligate participants to make frequent determinations (e.g. daily) that they maintain possession and control of all customers' fully paid and excess collateral securities and to segregate their proprietary activities from those of their customers. Under these regimes, pending securities purchases do not belong to the customer; thus, there is no customer trade or position entered into the CCP. As a result, participants provide collateral to the CCP on behalf of their customers regardless of whether they are acting on a principal or agent basis, and the CCP is not able to identify positions or possess the assets of its participants' customers.

access to central clearing where direct access is either not possible (e.g. due to an inability to meet membership criteria) or not considered commercially appropriate (e.g. due to the cost of establishing and maintaining the infrastructure necessary to perform as a clearing member or contributing to a CCP's default resources). A CCP should employ an account structure that enables it readily to identify positions belonging to a participant's customers and to segregate related collateral. Segregation of customer collateral by a CCP can be achieved in different ways, including through individual or omnibus accounts.

231. The degree of protection achievable for customer collateral will depend on whether customers are protected on an individual or omnibus basis and the way initial collateral is collected (gross or net basis) by the CCP.[109] Each of these decisions will have implications for the risks the CCP faces from its participants and, in some cases, their customers. The CCP should understand, monitor, and manage these risks.[110] Similarly, there are advantages and disadvantages to each type of account structure that the CCP should consider when designing its segregation regime.

Individual account structure

232. The individual account structure provides a high degree of protection to the clearing level collateral of customers of participants in a CCP, even in the case where the losses associated with another customer's default exceed the resources of the participant. Under this approach, each customer's collateral is held in a separate, segregated individual account at the CCP, and depending on the legal framework applicable to the CCP, a customer's collateral may only be used to cover losses associated with the default of that customer (i.e. customer collateral is protected on an individual basis). This account structure facilitates the clear and reliable identification of a customer's collateral, which supports full portability of an individual customer's positions and collateral or, alternatively, can expedite the return of collateral to the customer. Since all collateral maintained in the individual customer's account is used to collateral that customer's positions only, the CCP should be able to transfer these positions from the customer account of a defaulting participant to that of another participant with

[109] Collecting collateral on a gross basis means that the amount of collateral a participant must post to the CCP on behalf of its customers is the sum of the amounts of collateral required for each such customer. Collecting collateral on a net basis means that the participant may, in calculating the amount of collateral it must post to the CCP on behalf of its customers, offset the amounts of collateral associated with the portfolios of different customers.

[110] See also Principle 19 on tiered participation arrangements.

sufficient collateral to cover the exposures. The use of individual accounts and the collection of collateral on a gross basis provide flexibility in how a customer's portfolio may be ported to another participant or group of participants.[111] Maintaining individual accounts, however, can be operationally and resource intensive for the CCP in settling transactions and ensuring accurate bookkeeping. This approach could impact the overall efficiency of the CCP's operations. Finally, effectively achieving the advantages of maintaining individual accounts may depend upon the legal framework applicable to the insolvency of the participant.

Omnibus account structure

233. Another approach would be to use an omnibus account structure where all collateral belonging to all customers of a particular participant is commingled and held in a single account segregated from that of the participant. This approach can be less operationally intensive, can be more efficient when porting positions and collateral for a group of customers of a defaulting participant (where there has been no customer default or where customer collateral is legally protected on an individual basis), and can be structured to protect customers' collateral from being used to cover a default by the direct participant.

234. Where a CCP operates in a dual system (i.e. Islamic and conventional), it should establish separate omnibus accounts for Islamic and conventional businesses to avoid the collateral being commingled.

235. However, depending on the legal framework and the CCP's rules, omnibus accounts where the customer collateral is protected on an omnibus basis may expose a customer to "fellow-customer risk" – the risk that another customer of the same participant will default and create a loss that exceeds both the amount of available collateral supporting the defaulting customer's positions and the available resources of the participant.[112] As a result, the remaining commingled collateral of the participant's non-defaulting customers is exposed to the loss. Fellow-customer risk is of particular concern because customers have limited, if any, ability to monitor or to manage the risk of their fellow customers.

[111] As a practical matter, an individual account structure is inconsistent with net collection of collateral, since under such netting, it is impractical for the CCP to allocate the net collateral to individual customers.

[112] In some jurisdictions, customers in an omnibus account can include affiliates of the direct participant.

236. One potential solution is for omnibus account structures to be designed in a manner that operationally commingles collateral related to customer positions while protecting customers legally on an individual basis – that is, protecting them from fellow-customer risk. Such individual protection does require the CCP to maintain accurate books sufficient to promptly ascertain an individual customer's interest in a portion of the collateral. A failure to do so can lead to delays or even losses in returning collateral and other collateral that hasbeen provided to the CCP to individual customers in the event a participant becomes insolvent.[113]

237. The degree to which portability is fostered for a customer whose assets are held in an omnibus account also varies depending on whether the CCP collects collateral on a grossor net basis. As with account structure, there are advantages and disadvantages to the alternative ways in which collateral may be collected by the CCP that employs an omnibus account structure. Collateral calculated on a gross basis to support individual customer portfolios results in less netting efficiency at the participant level; however, it is likely to preclude the possibility of under-collateralised customer positions when ported. As a result, CCPs can port a participant's customers' positions and related collateral in bulk or piecemeal.[114] Gross collateral enhances the feasibility of portability, which is desirable since porting avoids the transactions costs, including bid-offer spreads associated with terminating and replacing a participant's customers' positions. When collateral is collected on a gross basis, it is more likely that there will be sufficient collateral in the omnibus account to cover all positions of a participant's customers.

238. When collateral is collected by the CCP on a net basis but held in an omnibus account structure, there is a risk that full portability cannot be achieved.[115] Since the collateral maintained in the omnibus account covers the net positions across all customers of a particular

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[113] Ascertaining each customer's interest in the omnibus account may require reliance on the participant's records containing the sub-accounting for individual customers. Under some legal frameworks, the collateral in the omnibus account is distributed to customers proportionately, based on their net customer claims, and participants may be required to provide certain customer information to the CCP.

[114] Although portability on a portfolio basis has historically been feasible in the absence of a customer default, it is possible that such portability may not be achievable due to a lack of willing and able transferees. Such lack may occur due to stressed market conditions, the complexity or size of the portfolio, or lack of information on the individual constituents.

[115] Collateral exceeding the amount required by the CCP to cover the net positions is often maintained by the participant.

participant, upon a participant default, any excess collateral maintained by the defaulting participant may not be readily available for porting to another participant to collateralise a customer's positions on a going-forward basis. Moreover, other than a bulk transfer of all customer positions of the defaulting participant, along with the aggregate of the customer collateral held at the CCP and at the participant, any transfer of a customer's positions to another participant would depend on the ability and willingness of customers to provide additional collateral. Otherwise, porting individual customer portfolios, with their pro rata share of net collateral, to multiple transferee clearing members is likely to result in under-collateralised customer positions. Transferee clearing members are unlikely to accept such positions unless the collateral shortfall is remedied by the customer.

Factors to consider in choosing the level of protection

239. In considering whether to offer individual customer collateral protection at the clearing level, the CCP should take into account all relevant circumstances. Such circumstances include applicable insolvency regimes, costs of implementation, and risk-management challenges associated with the use of individual customer accounts, as well as the important benefits of individual customer protection. If the CCP determines that individual customer accounts should be offered, then the CCP should endeavour to offer them at reasonable cost and in an unrestrictive manner and encourage direct participants to offer those accounts to their customers at a reasonable cost and in an unrestrictive manner.

Transfer of positions and collateral

240. Efficient and complete portability of a participant's customers' positions and related collateral is important in both pre-default and post-default scenarios but is particularly critical when a participant defaults or is undergoing insolvency proceedings.[116] A CCP's ability to transfer customers' positions and related collateral in a timely manner may depend on such factors as market conditions, sufficiency of information on the individual constituents, and the complexity or sheer size of the portfolio. A CCP should therefore structure its portability arrangements in a way that makes it highly likely that the positions and collateral of a defaulting

[116] A customer should also be able to transfer its positions and collateral to another participant in the normal course of business (e.g. in the case of a relationship with a new clearing firm or merger of entities), subject to applicable laws and contractual terms. In addition, portability arrangements can also facilitate an orderly wind down of a participant.

participant's customers will be effectively transferred to one or more other participants, taking into account all relevant circumstances. In order to achieve a high likelihood of portability, a CCP will need to have the ability to identify positions that belong to customers, identify and assert its rights to related collateral held by or through the CCP, transfer positions and related collateral to one or more other participants, identify potential participants to accept the positions, disclose relevant information to such participants so that they can evaluate the counterparty credit and market risk associated with the customers and positions, respectively, and facilitate the CCP's ability to carry out its default management procedures in an orderly manner. A CCP's rules and procedures should require participants to facilitate the transfer of a participant's customers' positions and collateral upon the customer's request, subject to any notice or other contractual requirements. The CCP should obtain the consent of the direct participant to which positions and collateral are ported. If there are circumstances where this would not be the case, they should be set out in the CCP's rules, policies, or procedures. A CCP's policies and procedures also should providefor the proper handling of positions and collateral of customers of a defaulting participant.[117]

Disclosure

241. A CCP should state its segregation and portability arrangements, including the method for determining the value at which customer positions will be transferred, in its rules, policies, and procedures.[118] A CCP's disclosure should be adequate such that customers can understand how much customer protection is provided, how segregation and portability are achieved, and any risks or uncertainties associated with such arrangements. Disclosure helps customers to assess the related risks and conduct due diligence when entering into transactions that are cleared or settled through a direct participant in the CCP. Customers should have sufficient information about which of its positions and collateral held at or through a CCP are segregated from positions and collateral of the participant and the CCP. Disclosure regarding segregation should include: (a) whether the segregated assets are reflected on the books and records at the CCP or unaffiliated third-party custodians that hold assets for the CCP; (b) who holds the customer collateral (e.g. CCP or third-party custodian); and (c) under

[117] See also Principle 13 on participant-default rules and procedures.

[118] See Principle 23 on disclosure of rules, key procedures, and market data.

what circumstances customer collateral may be used by the CCP. In particular, the CCP should disclose whether customer collateral is protected on an individual or omnibus basis.

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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.

242. This principle should be reviewed in the context of Principle 3 on the framework for the comprehensive management of risks, Principle 21 on efficiency and effectiveness, and other principles, as appropriate.

Key considerations

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.*

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.*

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.*

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.*

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.*

Questions by key consideration

Key consideration 1:

Q.15.1.1: How does the FMI identify its general business risks? What general business risks has the FMI identified?

Q.15.1.2: How does the FMI monitor and manage its general business risks on an ongoing basis? Does the FMI's business risk assessment consider the potential effects on its cash flow and (in the case of a privately operated FMI) capital?

Key consideration 2:

Q.15.2.1: Does the FMI hold liquid net assets funded by equity so that it can continue operations and services as a going concern if it incurs general business losses?

Q.15.2.2: How does the FMI calculate the amount of liquid net assets funded by equity to cover its general business risks? How does the FMI determine the length of time and associated operating costs of achieving a recovery or orderly wind-down of critical operations and services?

Key consideration 3:

Recovery or orderly wind-down plan

Q.15.3.1: Has the FMI developed a plan to achieve a recovery or orderly wind-down, as appropriate? If so, what does this plan take into consideration (e.g. the operational, technological and legal requirements for participants to establish and move to an alternative arrangement)?

Resources

Q.15.3.2: What amount of liquid net assets funded by equity is the FMI holding for purposes of implementing this plan? How does the FMI determine whether this amount is sufficient for such implementation? Is this amount at a minimum equal to six months of the FMI's current operating expenses?

Q.15.3.3: How are the resources designated to cover business risks and losses separated from resources designated to cover participant defaults or other risks covered under the financial resources principles?

Q.15.3.4: Does the FMI include equity held under international risk-based capital standards to cover general business risks?

Key consideration 4:

Q.15.4.1: What is the composition of the FMI's liquid net assets funded by equity? How will the FMI convert these assets as needed into cash at little or no loss of value in adverse market conditions?

Q.15.4.2: How does the FMI regularly assess the quality and liquidity of its liquid net assets funded by equity to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions?

Key consideration 5:

Q.15.5.1: Has the FMI developed a plan to raise additional equity? What are the main features of the FMI's plan to raise additional equity should its equity fall close to or fall below the amount needed?

Q.15.5.2: How frequently is the plan to raise additional equity reviewed and updated?

Q.15.5.3: What is the role of the FMI's board (or equivalent) in reviewing and approving the FMI's plan to raise additional equity if needed?

Explanatory note

243. 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).[119] In these cases, general business risk may cause an FMI to experience an extraordinary one-time loss as opposed to recurring losses.

[119] See also Principle 1 on legal basis, Principle 16 on custody and investment risks, and Principle 17 on operational risk.

Identifying business risk

244. 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 howspecific 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.

245. 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 takaful or indemnity from a third party.

Measuring and monitoring business risk

246. 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).

Determining sufficient liquid net assets

247. An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses.[120] Equity allows an FMI to absorb losses on an ongoing basis and should be permanently available for this purpose. 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.[121] Accordingly, an FMI should maintain a viable plan to achieve recovery and orderly wind-down and should hold sufficient liquid net assets funded by equity to implement this plan.[122] The appropriate amount of liquid net assets funded by equity will depend on the content of the plan and, specifically, on the size of the FMI, the scope of its activities, the types of actions included in the plan, and the length of time needed to implement them. An FMI should also take into consideration the operational, technological, and legal requirements for participants to establish and move to an alternative arrangement in the event of an orderly wind-down. At a minimum, however, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses.[123]

248. In order to estimate the amount of liquid net assets funded by equity that a particular FMI would need, the FMI should regularly analyse and understand how its revenue and operating expenses may change under a variety of adverse business scenarios as well as how it might be affected by extraordinary one-time losses. This analysis should also be performed when a material change to the assumptions underlying the model occurs, either because of changes to the FMI's business model or because of external changes. An FMI

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[120] If the FMI's corporate structure is such that it cannot legally or institutionally raise equity (e.g. under certain structures of mutual ownership or when the FMI is run by a central bank) or if the FMI is a new start-up and cannot initially raise the required level of equity, it should ensure an equal amount of equivalent loss absorbing financial resources is available.

[121] Recovery could include recapitalising, replacing management, merging with another FMI, revising business strategies (including cost or fee structures), or restructuring services provided.

[122] For the purposes of this principle, the requirement for liquid net assets funded by equity ensures that the assets held for the purposes of this principle are sufficiently liquid to be available to mitigate any potential business risks in a timely manner, can only be used for business risk purposes, and are funded by equity rather than long term liabilities.

[123] Operating expenses may exclude depreciation and amortisation expenses for purposes of this calculation.

needs to consider not only possible decreases in revenues but also possible increases in operating expenses, as well as the possibility of extraordinary one-time losses, when deciding on the amount of liquid net assets to hold to cover general business risk.

249. Assets held by an FMI to cover risks or losses other than business risk (e.g. 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.[124] However, equity held under international risk-based capital standards should be included where relevant and appropriate to avoid duplicate capital requirements.

250. 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.

Maintaining sufficient equity

251. 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.

252. In developing a capital plan, an FMI should consider a number of factors, including its ownership structure and any insured business risks. For example, an FMI should determine if and to what extent specific business risks are covered by (a) explicit insurance from a third party or (b) explicit indemnity agreements from a parent, owners, or participants (e.g. general loss-allocation provisions and parent guarantees), which would be realisable within the

[124] Depending on the rules of the particular FMI and the insolvency law of the jurisdiction in which it is established, the equity of an FMI may ultimately be used if the resources that form the default backing are insufficient to cover the losses generated in the event of a participant default.

recovery or orderly wind-down time frame. Given the contingent natureof these resources, an FMI should use conservative assumptions when taking them into account for its capital plan. Furthermore, these resources should not be taken into account when assessing the FMI’s capital adequacy.

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Principle 16: Custody and investment risks

An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in Sharīʿah-compliant instruments with minimal credit, market, and liquidity risks.

253. This principle should be reviewed in the context of Principle 4 on credit risk, Principle 5 on collateral, Principle 7 on liquidity risk, and other principles, as appropriate.

Key considerations

1. *An FMI should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.*

2. *An FMI should have prompt access to its assets and the assets provided by participants, when required.*

3. *An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.*

4. *An FMI's investment strategy should be consistent with Sharīʿah requirements and its overall risk management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high-quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.*

Questions by key consideration

Key consideration 1:

Q.16.1.1: If the FMI uses custodians, how does the FMI select its custodians? What are the specific selection criteria the FMI uses, including supervision and

regulation of these entities? How does the FMI monitor the custodians' adherence to these criteria?

Q.16.1.2: How does the FMI verify that these entities have robust accounting practices, safekeeping procedures, and internal controls that fully protect its and its participants' assets?

Key consideration 2:

Q.16.2.1: How has the FMI established that it has a sound legal basis to support enforcement of its interest or ownership rights in assets held in custody?

Q.16.2.2: How does the FMI ensure that it has prompt access to its assets, including securities that are held with a custodian in another time zone or legal jurisdiction, in the event of participant default?

Key consideration 3:

Q.16.3.1: How does the FMI evaluate and understand its exposures to its custodian banks? In managing those exposures, how does it take into account the full scope of its relationship with each custodian bank? For instance, does the FMI use multiple custodians for the safekeeping of its assets to diversify exposure to any single custodian? How does the FMI monitor concentration of risk exposures to its custodian banks?

Key consideration 4:

Investment strategy

Q.16.4.1: How does the FMI ensure that its investment strategy complies with Sharīʿah requirements and is consistent with its overall risk management strategy? How and to whom does the FMI disclose its investment strategy?

Q.16.4.2: Where the FMI invests assets of participants heldʿ as part of its Sharīʿah-compliant business, how does it ensure that those assets are invested only in Sharīʿah-compliant ways?

Q.16.4.3: How does the FMI ensure on an ongoing basis that its investments are secured by, or are claims on, high-quality obligors?

Risk characteristics of investments

Q.16.4.4: How does the FMI consider its overall exposure to an obligor in choosing investments? What investments are subject to limits to avoid concentration of credit risk exposures?

Q.16.4.5: Does the FMI invest participant assets in the participants' own securities or those of its affiliates?

Q.16.4.6: How does the FMI ensure that its investments allow for quick liquidation with little, if any, adverse price effect?

Explanatory note

254. An FMI has the responsibility to safeguard its assets, such as cash and securities, as well as the assets that its participants have provided to the FMI. Custody risk is the risk of loss on assets held in custody in the event of a custodian's (or subcustodian's) insolvency, negligence, fraud, poor administration, or inadequate record-keeping. Assets that are used by an FMI to support its operating funds or capital funds or that have been provided by participants to secure their obligations to the FMI should be held at supervised or regulated entities that have strong processes, systems, and credit profiles, including other FMIs (e.g. CSDs). In addition, assets should generally be held in a manner that assures the FMI of prompt access to those assets in the event that the FMI needs to draw on them. Investment risk refers to the risk of loss faced by an FMI when it invests its own or its participants' assets.

Use of custodians

255. An FMI should mitigate its custody risk by using only supervised and regulated entities with robust accounting practices, safekeeping procedures, and internal controls that fully protect its own and its participants' assets. It is particularly important that assets held in custody are protected against claims of a custodian's creditors. The custodian should have a sound legal basis supporting its activities, including the segregation of assets (see also Principle 1 on legal basis and Principle 11 on CSDs). The custodian also should have a strong financial position to be able to sustain losses from operational problems or non-custodial activities. An FMI should confirm that its interest or ownership rights in the assets can be

enforced and that it can have prompt access to its assets and the assets provided by participants, when required. Timely availability and access should be ensured even if these securities are held in another time zone or jurisdiction. Furthermore, the FMI should confirm it has prompt access to the assets in the event of a default of a participant.

256. An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each custodian bank. For example, a financial institution may serve as a custodian bank to an FMI as well as a settlement bank and liquidity provider to the FMI. The custodian bank also might be a participant in the FMI and offer clearing services to other participants. An FMI should carefully consider all of its relationships with a particular custodian bank to ensure that its overall risk exposure to an individual custodian remains within acceptable concentration limits. Where feasible, an FMI could consider using multiple custodians for the safekeeping of its assets to diversify its exposure to any single custodian. For example, a CCP may want to use one custodian for its collateral assets and another custodian for its prefunded default arrangement. Such a CCP, however, may need to balance the benefits of risk diversification against the benefits of pooling resources at one or a small number of custodians. In any event, an FMI should monitor the concentration of risk exposures to, and financial condition of, its custodian banks on an ongoing basis.

Investment strategy

257. An FMI's strategy for investing its own and its participants' assets should be consistent with Sharī'ah requirements and its overall risk management strategy and be fully disclosed to its participants. Where an FMI operates in a dual system, it should ensure its investments are clearly distinguished. When making its investment choices, the FMI should not allow pursuit of profit to compromise its financial soundness and liquidity risk management. Investments should be secured by, or be claims on, high-quality obligors to mitigate the credit risk to which the FMI is exposed. Also, because the value of an FMI's investments may need to be realised quickly, investments should allow for quick liquidation with little, if any, adverse price effect. An FMI should carefully consider its overall credit risk exposures to individual obligors, including other relationships with the obligor that create additional exposures such as an obligor that is also a participant or an affiliate of a participant in the FMI. In addition, an FMI should not invest participant assets in the participant's own securities or those of its affiliates. If an FMI's own resources can be used to cover losses and liquidity pressures resulting from a participant default, the investment of those resources should not compromise the FMI's ability to use them when needed.

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Principle 17: Operational risk

An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or majordisruption.

258. This principle should be reviewed in the context of Principle 20 on FMI links, Principle 21 on efficiency and effectiveness, Principle 22 on communication standards and procedures, and other principles, as appropriate.

Key considerations

1. *An FMI should establish a robust operational risk management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.*

2. *An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.*

3. *An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.*

4. *An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.*

5. *An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.*

6. *An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site*

and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.

7. *An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.*

Questions by key consideration

Key consideration 1:

Identification of operational risk

Q.17.1.1: What are the FMI's policies and processes for identifying the plausible sources of operational risks? How do the FMI's processes identify plausible sources of operational risks, whether these risks arise from internal sources (e.g. the arrangements of the system itself, including human resources), from the FMI's participants or from external sources?

Q.17.1.2: What sources of operational risks has the FMI identified? What single points of failure in its operations has the FMI identified?

Management of operational risk

Q.17.1.3: How does the FMI monitor and manage the identified operational risks? Where are these systems, policies, procedures and controls documented?

Policies, processes and controls

Q.17.1.4: What policies, processes and controls does the FMI employ that are designed to ensure that operational procedures are implemented appropriately? To what extent do the FMI's systems, policies, processes and controls take into consideration relevant international, national and industry-level operational risk management standards?

Q.17.1.5: What are the FMI's human resources policies to hire, train and retain qualified personnel, and how do such policies mitigate the effects of high rates of personnel turnover or key-person risk? How do the FMI's human resources and risk management policies address fraud prevention?

Q.17.1.6: How do the FMI's change management and project management policies and processes mitigate the risks that changes and major projects inadvertently affect the smooth functioning of the system?

Key consideration 2:

Roles, responsibilities and framework

Q.17.2.1: How has the board of directors defined the key roles and responsibilities for operational risk management?

Q.17.2.2: Does the FMI's board explicitly review and endorse the FMI's operational risk management framework? How frequently does the board review and endorse the FMI's operational risk management framework?

Review, audit and testing

Q.17.2.3: How does the FMI review, audit and test its systems, policies, procedures and controls, including its operational risk management arrangements with participants? How frequently does the FMI conduct these reviews, audits and tests with participants?

Q.17.2.4: To what extent, where relevant, is the FMI's operational risk management framework subject to external audit?

Key consideration 3:

Q.17.3.1: What are the FMI's operational reliability objectives, both qualitative and quantitative? Where and how are they documented?

Q.17.3.2: How do these objectives ensure a high degree of operational reliability?

Q.17.3.3: What are the policies in place that are designed to achieve the FMI's operational reliability objectives to ensure that the FMI takes appropriate action as needed?

Key consideration 4:

Q.17.4.1: How does the FMI review, audit and test the scalability and adequacy of its capacity to handle, at a minimum, projected stress volumes? How frequently does the FMI conduct these reviews, audits and tests?

Q.17.4.2: How are situations where operational capacity is neared or exceeded addressed?

Key consideration 5:

Physical security

Q.17.5.1: What are the FMI's policies and processes, including change management and project management policies and processes, for addressing the plausible sources of physical vulnerabilities and threats on an ongoing basis?

Q.17.5.2: Do the FMI's policies, processes, controls and testing appropriately take into consideration relevant international, national and industry-level standards for physical security?

Information security

Q.17.5.3: What are the FMI's policies and processes, including change management and project management policies and processes, for addressing the plausible sources of information security vulnerabilities and threats on an ongoing basis?

Q.17.5.4: Do the FMI's policies, processes, controls and testing appropriately take into consideration relevant international, national and industry-level standards for information security?

Key consideration 6:

Objectives of business continuity plan

Q.17.6.1: How and to what extent does the FMI's business continuity plan reflect objectives, policies and procedures that allow for the rapid recovery and timely resumption of critical operations following a wide-scale or major disruption?

Design of business continuity plan

Q.17.6.2: How and to what extent is the FMI's business continuity plan designed to enable critical IT systems to resume operations within two hours following disruptive events, and to enable the FMI to facilitate or complete settlement by the end of the day even in extreme circumstances?

Q.17.6.3: How is the contingency plan designed to ensure that the status of all transactions can be identified in a timely manner, at the time of the disruption; and if there is a possibility of data loss, what are the procedures to deal with such loss (e.g. reconciliation with participants or third parties)?

Q.17.6.4: How do the FMI's crisis management procedures address the need for effective communications internally and with key external stakeholders and authorities?

Secondary site

Q.17.6.5: How does the FMI's business continuity plan incorporate the use of a secondary site (including ensuring that the secondary site has sufficient resources, capabilities, functionalities and appropriate staffing arrangements)? To what extent is the secondary site located a sufficient geographic distance from the primary site such that it has a distinct risk profile?

Q.17.6.6: Has the FMI considered alternative arrangements (such as manual, paper-based procedures or other alternatives) to allow the processing of time-critical transactions in extreme circumstances?

Review and testing

Q.17.6.7: How are the FMI's business continuity and contingency arrangements reviewed and tested, including with respect to scenarios related to wide-scale

and major disruptions? How frequently are these arrangements reviewed and tested?

Q.17.6.8: How does the review and testing of the FMI's business continuity and contingency arrangements involve the FMI's participants, critical service providers and linked FMIs as relevant? How frequently are the FMI's participants, critical service providers and linked FMIs involved in the review and testing?

Key consideration 7:

Risks to the FMI's own operations

Q.17.7.1: What risks has the FMI identified to its operations arising from its key participants, other FMIs, and service and utility providers? How and to what extent does the FMI monitor and manage these risks?

Q.17.7.2: If the FMI has outsourced services critical to its operations, how and to what extent does the FMI ensure that the operations of a critical service provider meet the same reliability and contingency requirements they would need to meet if they were provided internally?

Risks posed to other FMIs

Q.17.7.3: How and to what extent does the FMI identify, monitor and mitigate the risks it may pose to another FMI?

Q.17.7.4: To what extent does the FMI coordinate its business continuity arrangements with those of other interdependent FMIs?

Explanatory note

259. Operational risk is the risk that deficiencies in information systems, internal processes, and personnel or disruptions from external events will result in the reduction, deterioration, or breakdown of services provided by an FMI. Operational failures can damage an FMI's reputation or perceived reliability, lead to legal consequences, and result in financial

losses incurred by the FMI, participants, and other parties. In certain cases, operational failures can also be a source of systemic risk. An FMI should establish a robust framework to manage its operational risks with appropriate systems, policies, procedures, and controls. As part of an FMI's operational risk management framework, the FMI should identify the plausible sources of operational risk; deploy appropriate systems; establish appropriate policies, procedures, and controls; set operational reliability objectives; and develop a business continuity plan. An FMI should take a holistic approach when establishing its operational risk management framework.

Identifying sources of operational risk

260. An FMI should actively identify, monitor, and manage the plausible sources of operational risk and establish clear policies and procedures to address them. Operational risk can stem from both internal and external sources. Internal sources of operational risk include inadequate identification or understanding of risks and the controls and procedures needed to limit and manage them, inadequate control of systems and processes, inadequate screening of personnel, and, more generally, inadequate management. External sources of operational risk include the failure of critical service providers or utilities or events affecting a wide metropolitan area such as natural disasters, terrorism, and pandemics. Both internal and external sources of operational risk can lead to a variety of operational failures that include (a) errors or delays in message handling, (b) miscommunication, (c) service degradation or interruption, (d) fraudulent activities by staff, and (e) disclosure of confidential information to unauthorised entities. If an FMI provides services in multiple time zones, it may face increased operational risk due to longer operational hours and less downtime for maintenance. An FMI should identify all potential single points of failure in its operations.[125] Additionally, an FMI should assess the evolving nature of the operational risk it faces on an ongoing basis (e.g. pandemics and cyber-attacks), so that it can analyse its potential vulnerabilities and implement appropriate defence mechanisms. It should also be aware of possible risk correlations; for example, a lockdown/movement control order due to a pandemic might involve FMI staff working remotely under circumstances that increase the risks of cyber-attacks.

[125] A single point of failure is any point in a system, whether a service, activity, or process, that, if it fails to work correctly, leads to the failure of the entire system.

261. A TR typically serves as a single source of information for a particular market, and it may be the central registry for certain trades. Therefore, a TR's failure to perform as expected could cause significant disruption. The key risk of a TR is operational. Deficiencies in business continuity management, data integrity, and the safeguarding of data are a particular concern. Inadequate disclosure or faulty delivery of data by a TR to relevant authorities or the public could undermine the primary purpose of the TR. Data recorded by a TR may also be used as inputs by the TR's participants and potentially by other relevant infrastructures and service providers. Therefore, continuous availability of data stored in a TR is critical.[126] Also, a TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources. Where a TR provides access to another type of FMI, such as a CCP, the linked FMIs may be exposed to additional risks if the interface is not properly designed. FMIs establishing a link to a TR should ensure that the system and communication arrangements between the linked entities are reliable and secure such that the operation of the link does not pose significant reliability and security risks.

Operational risk management

262. An FMI should establish clear policies, procedures, and controls that mitigate and manage its sources of operational risk. Overall, operational risk management is a continuous process encompassing risk assessment, defining an acceptable tolerance for risk, and implementing risk controls. This process results in an FMI accepting, mitigating, or avoiding risks consistent with its operational reliability objectives. An FMI's governance arrangements are pertinent to its operational risk management framework (see also Principle 2 on governance). In particular, an FMI's board should explicitly define the roles and responsibilities for addressing operational risk and endorse the FMI's operational risk-management framework.

263. To ensure the proper functioning of its risk controls, an FMI should have sound internal controls. For example, an FMI should have adequate management controls, such as setting operational standards, measuring and reviewing performance, and correcting deficiencies. There are many relevant international, national, and industry-level standards,

[126] The mitigation of operational risk is particularly important because the information maintained by a TR can support bilateral netting and be used to provide services directly to market participants or other providers, including other linked FMIs.

guidelines, or recommendations that an FMI may use in designing its operational risk-management framework. Conformity with commercial standards can help an FMI reach its operational objectives. For example, commercial standards exist for information security, business continuity, and project management. An FMI should regularly assess the need to integrate the applicable commercial standards into its operational risk management framework. In addition, an FMI should seek to comply with relevant commercial standards in a manner commensurate with the FMI's importance and level of interconnectedness.

264. An FMI's arrangements with participants, operational policies, and operational procedures should be periodically, and whenever necessary, tested and reviewed, especially after significant changes occur to the system or a major incident occurs. In order to minimise any effects of the testing on operations, tests should be carried out in a "testing environment." This testing environment should, to the extent possible, replicate the production environment (including the implemented security provisions, in particular, those regarding data confidentiality). Additionally, key elements of an FMI's operational risk-management framework should be audited periodically and whenever necessary. In addition to periodic internal audits, external audits may be necessary, depending on the FMI's importance and level of interconnectedness. Consistent with the evolving nature of operational risk management, an FMI's operational objectives should be periodically reviewed to incorporate new technological and business developments.

265. Because the proper performance of an FMI's employees is a core aspect of any operational risk management framework, an FMI should employ sufficient, well-qualified personnel. An FMI's personnel should be able to operate the system safely and efficiently and consistently follow operational and risk management procedures during normal and abnormal circumstances. An FMI should implement appropriate human resources policies to hire, train, and retain qualified personnel, thereby mitigating the effects of high rates of personnel turnover or key-person risk. Additionally, an FMI should have appropriate human resources and risk management policies to address fraud prevention.

266. The FMI's operational risk management framework should include formal change-management and project-management processes to mitigate operational risk arising from modifications to operations, policies, procedures, and controls. Change-management processes should provide mechanisms for preparing, approving, tracking, testing, and implementing all changes to the system. Project-management processes, in the form of policies and procedures, should mitigate the risk of any inadvertent effects on an FMI's current or future activities due to an upgrade, expansion, or alteration to its service offerings,

especially for major projects. In particular, these policies and procedures should guide the management, documentation, governance, communication, and testing of projects, regardless of whether projects are outsourced or executed in-house.

Operational reliability

267. An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives. These objectives serve as benchmarks for an FMI to evaluate its efficiency and effectiveness and evaluate its performance against expectations. These objectives should be designed to promote confidence among the FMI's participants. Operational reliability objectives should include the FMI's operational performance objectives and committed service-level targets. Operational performance objectives and service-level targets should define both qualitative and quantitative measures of operational performance and should explicitly state the performance standards the FMI is intending to meet. The FMI should monitor and assess regularly whether the system is meeting its established objectives and service-level targets. The system's performance should be reported regularly to senior management, relevant board committees, participants, and authorities. In addition, an FMI's operational objectives should be periodically reviewed to incorporate new technological and business developments.

Incident management

268. An FMI should have comprehensive and well-documented procedures in place to record, report, analyse, and resolve all operational incidents. After every significant disruption, an FMI should undertake a "post-incident" review to identify the causes and any required improvement to the normal operations or business continuity arrangements. Such reviews should, where relevant, include the FMI's participants.

Operational capacity

269. An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives, such as the required processing speed. A TR, in particular, should have scalable capacity adequate to maintain historical data as required. Capacity management requires that the FMI monitor, review, and test (including stress test) the actual capacity and performance of the system on an ongoing basis. The FMI should carefully forecast demand and make appropriate plans to adapt to any plausible change in the volume of business or technical requirements. These plans should be based on a sound, comprehensive methodology so that the required service levels and performance can be achieved and maintained. As part of its capacity planning, an FMI should

determine a required level of redundant capacity, taking into account the FMI's level of importance and interconnectedness, so that if an operational outage occurs, the system is able to resume operations and process all remaining transactions before the end of the day.

Physical and information security

270. An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats. In particular, an FMI should have policies effective in assessing and mitigating vulnerabilities in its physical sites from attacks, intrusions, and natural disasters. An FMI should also have sound and robust information security policies, standards, practices, and controls to ensure an appropriate level of confidence and trust in the FMI by all stakeholders. These policies, standards, practices, and controls should include the identification, assessment, and management of security threats and vulnerabilities for the purpose of implementing appropriate safeguards into its systems. Data should be protected from loss and leakage, unauthorised access, and other processing risks, such as negligence, fraud, poor administration, and inadequate record-keeping. An FMI's information security objectives and policies should conform to commercially reasonable standards for confidentiality, integrity, authentication, authorisation, non-repudiation, availability, and auditability (or accountability), and should take account of the possibility of FMI personnel working remotely (including from home), whether routinely or under unexpected situations of disruption.

Business continuity management

271. Business continuity management is a key component of an FMI's operational risk-management framework. A business continuity plan should have clearly stated objectives and should include policies and procedures that allow for the rapid recovery and timely resumption of critical operations following a disruption to a service, including in the event of awide-scale or major disruption. An FMI should explicitly assign responsibility for business continuity planning and devote adequate resources to this planning. The plan should identify and address events that pose a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption, and should focus on the impact on theoperation of critical infrastructures and services. An FMI's business continuity plan should ensure that the FMI can continue to meet agreed-upon service levels in such events. Both internal and external threats should be considered in the business continuity plan, and the impact of each threat should be identified and assessed. In addition to reactive measures, an FMI's business continuity plan may need to include measures that prevent disruptions of critical operations. All aspects of the business continuity plan should be clearly and fully documented.

272. The objectives of an FMI's business continuity plan should include the system's recovery time and recovery point. An FMI should aim to be able to resume operations within two hours following disruptive events; however, backup systems ideally should commence processing immediately. The plan should be designed to enable the FMI to complete settlement by the end of the day even in case of extreme circumstances. Depending on their recovery-time objectives and designs, some FMIs may be able to resume operations with some data loss; however, contingency plans for all FMIs should ensure that the status of all transactions at the time of the disruption can be identified with certainty in a timely manner.

273. An FMI should set up a secondary site with sufficient resources, capabilities, and functionalities and appropriate staffing arrangements that would not be affected by a wide-scale disruption and would allow the secondary site to take over operations if needed.[127] The secondary site should provide the level of critical services necessary to perform the functions consistent with the recovery time objective and should be located at a geographical distance from the primary site that is sufficient to have a distinct risk profile.[128] Depending on the FMI's importance and level of interconnectedness, the need and possibilities for a third site could be considered – in particular, to provide sufficient confidence that the FMI's business continuity objectives will be met in all scenarios. Additionally, an FMI should consider how it could continue to operate should all or many of its staff have to work remotely – for example, in the event of movement control restrictions or widespread travel disruption. An FMI should also consider alternative arrangements (e.g. manual paper-based procedures) to allow for the processing of time-critical transactions in extreme circumstances.

274. An FMI's business continuity plan should also include clearly defined procedures for crisis and event management. The plan, for example, should address the need for rapid deployment of a multi-skilled crisis and event-management team as well as procedures to consult and inform participants, interdependent FMIs, authorities, and others (such as service providers and, where relevant, the media) quickly. Communication with regulators,

[127] A particular site may be primary for certain functions and secondary for others. It is not intended that an FMI would be required to have numerous separate secondary sites for each of its essential functions.

[128] An FMI should conduct a comparative risk analysis of the secondary site. The secondary site should in principle not be affected by an event that affects the primary site, with the exception of some very specific threats, such as a coordinated attack. Each site should have robust resilience based on the duplication of software and hardware, and the technology in place to replicate data between the various sites should be consistent with the chosen recovery-point objectives.

supervisors, and overseers is critical in case of a major disruption to an FMI's operations or a wider market distress that affects the FMI, particularly where relevant authorities might rely on data held by the FMI for crisis management. Depending on the nature of the problem, communication channels with local civil authorities (for physical attacks or natural disasters) or computer experts (for software malfunctions or cyber-attacks) may also need to be activated. If an FMI has global importance or critical linkages to one or more interdependent FMIs, it should set up, test, and review appropriate cross-system or cross-border crisis-management arrangements.

275. An FMI's business continuity plan and its associated arrangements should be subject to periodic review and testing. Tests should address various scenarios that simulate wide-scale disasters and intersite switchovers. An FMI's employees should be thoroughly trained to execute the business continuity plan and participants, critical service providers, and linked FMIs should be regularly involved in the testing and be provided with a general summary of the testing results. The FMI should also consider the need to participate in industry-wide tests. An FMI should make appropriate adjustments to its business continuity plans and associated arrangements based on the results of the testing exercises.

Interdependencies

276. An FMI is connected directly and indirectly to its participants, other FMIs, and its service and utility providers. Accordingly, the FMI should identify both direct and indirect effects on its ability to process and settle transactions in the normal course of business and manage risks that stem from an external operational failure of connected entities. These effects include those transmitted through its participants, which may participate in multiple FMIs. In addition, an FMI should also identify, monitor, and manage the risks it faces from and poses to other FMIs (see Principle 20 on FMI links). To the extent possible, interdependent FMIs should coordinate business continuity arrangements. An FMI also should consider the risks associated with its service and utility providers and the operational effect on the FMI if service or utility providers fail to perform as expected. An FMI should provide reliable service, not only for the benefit of its direct participants, but also for allentities that would be affected by its ability to process transactions.

277. To manage the operational risks associated with its participants, an FMI should consider establishing minimum operational requirements for its participants (see also Principle 18 on access and participation requirements). For example, an FMI may want to define operational and business continuity requirements for participants in accordance with the participant's role and importance to the system. In some cases, an FMI may want to identify

critical participants based on the consideration of transaction volumes and values, services provided to the FMI and other interdependent systems, and, more generally, the potential impact on other participants and the system as a whole in the event of a significant operational problem. Critical participants may need to meet some of the same operational risk management requirements as the FMI itself. An FMI should have clear and transparent criteria, methodologies, or standards for critical participants to ensure that their operational risks are managed appropriately.

278. An FMI that relies upon or outsources some of its operations to another FMI or a third-party service provider (e.g. data processing and information systems management) should ensure that those operations meet the same requirements they would need to meet if they were provided internally. The FMI should have robust arrangements for the selection and substitution of such providers, timely access to all necessary information, and the proper controls and monitoring tools. Some service providers may be critical, suchas those that generate environmental interdependencies, because several FMIs or some of their key participants rely upon their services.[129] A contractual relationship should be in place between the FMI and the critical service provider allowing the FMI and relevant authorities to have full access to necessary information. The contract should ensure that the FMI's approval is mandatory before the critical service provider can itself outsource material elements of the service provided to the FMI, and that in the event of such an arrangement, full access to the necessary information is preserved. Clear lines of communication should be established between the outsourcing FMI and the critical service provider to facilitate the flow of functions and information between parties in both ordinary and exceptional circumstances.

279. An FMI that outsources operations to critical service providers should disclose the nature and scope of this dependency to its participants. In addition to these service providers (such as financial messaging providers), an FMI is also typically dependent on the adequate functioning of utilities (such as power and telecommunication companies). As a result, an FMI should identify the risks from its critical service providers and utilities and take appropriate actions to manage these dependencies through appropriate contractual and organisational

[129] Environmental interdependencies result from indirect relationships between two or more systems that arise from broader factors, including a common reliance on a service provider or financial market. Examples include common third-party IT or network providers, common elements of the physical infrastructure (power, water, etc.), common financial markets, or even common risk management procedures.

arrangements. An FMI should inform its relevant authorities about any such dependencies on critical service providers and utilities and take measures to allow these authorities to be informed about the performance of these critical service providers and utilities. To that end, the FMI can contractually provide for direct contacts between the critical service provider and the relevant authority, contractually ensure that the relevant authority can obtain specific reports from the critical service provider, or the FMI may provide full information to the authority.

280. The relevant authority of the FMI may establish expectations specifically targeted at critical service providers. Adherence to these expectations can be achieved in one of two ways, at the discretion of the authority: (a) the authority monitors adherence to the expectations itself in a direct relationship with the critical service provider; or (b) the authority communicates the standards to the FMI, which obtains assurances from its critical service providers that they comply with the expectations. These expectations mayalso be relevant to an FMI as it reviews its contracts with critical service providers.

Access

PS	CSD	SSS	CCP	TR
●	●	●	●	●

Principle 18: Access and participation requirements

An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.

281. In reviewing this principle, it should be noted that FMIs are subject to the constraints of local laws and policies of the jurisdiction in which the FMI operates, and those laws may prohibit or require the inclusion of certain categories of financial institutions. This principle should be reviewed in the context of Principle 19 on tiered participation arrangements, Principle 21 on efficiency and effectiveness, and other principles, as appropriate.

Key considerations

1. *An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.*

2. *An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.*

3. *An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.*

Questions by key consideration

Key consideration 1:

Participation criteria and requirements

Q.18.1.1: What are the FMI's criteria and requirements for participation (such as operational, financial and legal requirements)?

Q.18.1.2: How do these criteria and requirements allow for fair and open access to the FMI's services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements?

Access to trade repositories

Q.18.1.3: For a TR, how do the terms of access for use of its services help ensure that competition and innovation in post-trade processing are not impaired? How are these terms designed to support interconnectivity with other FMIs and service providers, where requested?

Key consideration 2:

Justification and rationale of participation criteria

Q.18.2.1: How are the participation requirements for the FMI justified in terms of the safety and efficiency of the FMI and its role in the markets it serves, and tailored to and commensurate with the FMI's specific risks?

Q.18.2.2: Are there participation requirements that are not risk-based but required by law or regulation? If so, what are these requirements?

Q.18.2.3: Are all classes of participants subject to the same access criteria? If not, what is the rationale for the different criteria (e.g. size or type of activity, additional requirements for participants that act on behalf of third parties, and additional requirements for participants that are non-regulated entities)?

Least restrictive access

Q.18.2.4: How are the access restrictions and requirements reviewed to ensure that they have the least restrictive access that circumstances permit, consistent

with maintaining acceptable risk controls? How frequently is this review conducted?

Disclosure of criteria

Q.18.2.5: How are participation criteria, including restrictions in participation, publicly disclosed?

Key consideration 3:

Monitoring compliance

Q.18.3.1: How does the FMI monitor its participants' ongoing compliance with the access criteria? How are the FMI's policies designed to ensure that the information it uses to monitor compliance with participation criteria is timely and accurate?

Q.18.3.2: What are the FMI's policies for conducting enhanced surveillance of, or imposing additional controls on, a participant whose risk profile deteriorates?

Suspension and orderly exit

Q.18.3.3: What are the FMI's procedures for managing the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements?

Q.18.3.4: How are the FMI's procedures for managing the suspension and orderly exit of a participant disclosed to the public?

Explanatory note

282. Access refers to the ability to use an FMI's services and includes the direct use of the FMI's services by participants, including other market infrastructures (e.g. trading platforms) and, where relevant, service providers. In some cases, this includes the rules governing

indirect participation. An FMI should allow for fair and open access to its services.[130] It should control the risks to which it is exposed by its participants by setting reasonable risk-related requirements for participation in its services. An FMI should ensure that its participants and any linked FMIs have the requisite operational capacity, financial resources, legal powers, and risk management expertise to prevent unacceptable risk exposure for the FMI and other participants. An FMI's participation requirements should be clearly stated and publicly disclosed so as to eliminate ambiguity and promote transparency.

Fair and open access to payment systems, CSDs, SSSs, and CCPs

283. Fair and open access to FMI services encourages competition among market participants and promotes efficient and low-cost payment, clearing, and settlement. Because an FMI often benefits from economies of scale, there is typically only one FMI, or a small number of FMIs, for a particular market. As a result, participation in an FMI may significantly affect the competitive balance among market participants. In particular, limiting access to an FMI's services may disadvantage some market participants (and their customers), other FMIs (e.g. a CCP that needs access to a CSD), and service providers that do not have access to the FMI's services. Further, access to one or more FMIs may play an important role in a marketwide plan or policy for the safe and efficient clearing of certain classes of financial instruments and the promotion of efficient financial markets (including the reporting and recording of transaction data). An FMI's participation requirements should therefore allow for fair and open access, in all relevant jurisdictions, based on reasonable risk-related participation requirements. Moreover, open access may reduce the concentrations of risk that may result from highly tiered arrangements for payment, clearing, and settlement.

Fair and open access to TRs

284. For a TR, ensuring fair and open access may be essential because a wide set of stakeholders may need, or be required by law to have, access to the TR's data warehousing services, both to store and retrieve data. This may be even more relevant when one TR is serving a particular market and serves multiple jurisdictions. Access is critical for participants

[130] Central banks, however, may exclude certain categories of financial institutions (such as non-deposit-taking institutions) from the FMIs that they operate, such as LVPS, because of legislative constraints or broader policy objectives.

reporting trade information to the TR and for platforms that may submit transaction data on behalf of participants, including exchanges, electronic trading venues, and confirmation or matching service providers. In addition, other FMIs or platforms that offer ancillary services may need to obtain trade information from the TR to use as an input to these services.

285. In addition, a TR should provide terms of use that are commercially reasonable and are designed to support interconnectivity with other FMIs and service providers, where requested, so that competition and innovation in post-trade processing are not impaired as a result of centralising record-keeping activity. A TR should not engage in anti-competitive practices such as product or service tying, setting overly restrictive terms of use, or anti-competitive price discrimination. A TR also should not develop closed, proprietary interfaces that result in vendor lock-in or barriers to entry with respect to competing service providers that rely on the data maintained by the TR.

Risk-related participation requirements

286. An FMI should always consider the risks that an actual or prospective participant may pose to the FMI and other participants. Accordingly, an FMI should establish risk-related participation requirements adequate to ensure that its participants meet appropriate operational, financial, and legal requirements to allow them to fulfil their obligations to the FMI, including the other participants, on a timely basis. Where participants act for other entities (indirect participants), it may be appropriate for the FMI to impose additional requirements to ensure that the direct participants have the capacity to do so (see also Principle 19 on tiered participation arrangements). Operational requirements may include reasonable criteria relating to the participant's ability and readiness (e.g. its IT capabilities) to use an FMI's services. Financial requirements may include reasonable risk-related capital requirements, contributions to prefunded default arrangements, and appropriate indicators of creditworthiness. Legal requirements may include appropriate licences and authorisations to conduct relevant activities as well as legal opinions or other arrangements that demonstrate that possible conflict of laws issues would not impede the ability of an applicant (e.g. a foreign entity) to meet its obligations to the FMI. An FMI also may require participants to have appropriate risk management expertise. If an FMI admits non-regulated entities, it should take into account any additional risks that may arise from their participation and design its participation requirements and risk management controls accordingly.

287. An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to the FMI's specific risks, be

imposed in a manner commensurate with such risks, and be publicly disclosed.[131] The requirements should be objective and should not unnecessarily discriminate against particular classes of participants or introduce competitive distortions. For example, participation requirements based solely on a participant's size are typically insufficiently related to risk and deserve careful scrutiny. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit. While restrictions on access should generallybe based on reasonable risk-related criteria, such restrictions may also be subject to the constraints of local laws and policies of the jurisdiction in which the FMI operates.[132] Requirements should also reflect the risk profile of the activity; an FMI may have different categories of participation based on the type of activity. For example, a participant in the clearing services of a CCP may be subject to a different set of requirements than a participant in the auctioning process of the same CCP.

288. To help address the balance between open access and risk, an FMI should manage its participant-related risks through the use of risk management controls, risk-sharing arrangements, and other operational arrangements that have the least-restrictive impact on access and competition that circumstances permit. For example, an FMI can use credit limits or collateral requirements to help it manage its credit exposure to a particular participant. The permitted level of participation may be different for participants maintaining different levels of capital. Where other factors are equal, participants holding greater levels of capital may be permitted less-restrictive risk limits or be able to participate in more functions within the FMI. The effectiveness of such risk management controls may mitigate the need for an FMI to impose onerous participation requirements that limit access. An FMI could also differentiate its services to provide different levels of access at varying levels of cost and complexity. For example, an FMI may want to limit direct participation to certain types of entities and provide

[131] Efficiency considerations may affect open access. For example, in some instances, factors such as minimum transaction volumes are relevant to operational efficiency. However, considerations based solely on efficiency should not be used to justify participation requirements that in fact act as unjustifiable barriers to entry.

[132] For example, certain categories of financial institutions (such as non-deposit-taking institutions) may be excluded from certain FMIs, such as LVPS, because of local banking laws or policies. Conversely, some local laws, such as securities and antitrust laws, may require broader inclusion of classes of participants in certain types of FMIs, such as CCPs.

indirect access to others.[133] Participation requirements (and other risk controls) can be tailored to each tier of participants based on the risks each tier poses to the FMI and its participants.

Monitoring

289. An FMI should monitor compliance with its participation requirements on an ongoing basis through the receipt of timely and accurate information. Participants should be obligated to report any developments that may affect their ability to comply with an FMI's participation requirements. An FMI should have the authority to impose more-stringent restrictions or other risk controls on a participant in situations where the FMI determines the participant poses heightened risk to the FMI. For example, if a participant's creditworthiness declines,the FMI may require the participant to provide additional collateral or reduce the participant's credit limit. An FMI should consider additional reporting requirements for non-regulated institutions. An FMI should also have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements of the FMI.

[133] For example, an FMI may accept direct receipt of settlement instructions from indirect participants, which settle on the books of a direct participant. Indirect participants may or may not be explicitly recognised in an FMI's rules and subject to risk controls. In all cases, an indirect participant has a bilateral agreement with a direct participant.

PS	CSD	SSS	CCP	TR
●	●	●	●	●

Principle 19: Tiered participation arrangements

An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.

290. This principle should be reviewed in the context of Principle 14 on segregation and portability, Principle 18 on access and participation requirements, and other principles, as appropriate.

Key considerations

1. *An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.*

2. *An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.*

3. *An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.*

4. *An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.*

Questions by key consideration

Key consideration 1:

Tiered participation arrangements

Q.19.1.1: Does the FMI have any tiered participation arrangements? If so, describe these arrangements.

Q.19.1.2: How does the FMI gather basic information about indirect participation? Which information is collected and how frequently is it updated?

Risks to the FMI

Q.19.1.3: How does the FMI evaluate its risks arising from these arrangements?

Q.19.1.4: What material risks to the FMI arising from tiered participation arrangements has the FMI identified? How has it mitigated these risks?

Key consideration 2:

Q.19.2.1: How does the FMI identify material dependencies between direct and indirect participants that might affect the FMI?

Key consideration 3:

Q.19.3.1: Has the FMI identified (a) the proportion of activity that each direct participant conducts on behalf of indirect participants in relation to the direct participants' capacity, (b) direct participants that act on behalf of a material number of indirect participants, (c) indirect participants responsible for a significant proportion of turnover in the system, and (d) indirect participants whose transaction volumes or values are large relative to the capacity of the direct participant through which they access the FMI to manage risks arising from these transactions?

Q.19.3.2: What risks to the FMI arise, and how does the FMI manage these risks arising from key indirect participants?

Key consideration 4:

Q.19.4.1: What are the FMI's policies for reviewing its rules and procedures in order to mitigate risks to the FMI arising from tiered participation? How frequently is this review conducted?

Q.19.4.2: What criteria does the FMI use to determine when mitigating actions are required? How does the FMI monitor and mitigate its risks?

Explanatory note

291. Tiered participation arrangements occur when some firms (indirect participants) rely on the services provided by other firms (direct participants) to use the FMI's central payment, clearing, settlement, or recording facilities.[134]

292. The dependencies and risk exposures (including credit, liquidity, and operational risks) inherent in these tiered arrangements can present risks to the FMI and its smooth functioning as well as to the participants themselves and the broader financial markets.[135] For example, if an FMI has few direct participants but many indirect participants with large values or volumes of transactions, it is likely that a large proportion of the transactions processed by the FMI depend on a few direct participants. This will increase the severity of the effect on the FMI of a default of a direct participant or an operational disruption at a direct participant. The credit exposures in tiered relationships can also affect the FMI. If the value of an indirect participant's transactions is large relative to the direct participant's capacity to manage the risks, this may increase the direct participant's default risk. In some cases, for example, CCPs offering indirect clearing will face credit exposures to indirect participants or arising from indirect participants' positions if a direct participant defaults. There may also be legal or operational risk to the FMI if there is uncertainty about the liability for indirect participant transactions and how these transactions will be handled in the event of a default.[136]

293. The nature of these risks is such that they are most likely to be material where there are indirect participants whose business through the FMI is a significant proportion of the FMI's overall business or is large relative to that of the direct participant through which they access the FMI's services. Normally, the identification, monitoring, and management of risks from tiered participation will therefore be focused on financial institutions that are the immediate customers of direct participants and depend on the direct participant for access to an FMI's services. In exceptional cases, however, tiered participation arrangements may involve a

[134] For the purposes of this principle, an FMI can have two types of relationships that affect tiered participation arrangements. The first type of relationship is with participants in the FMI that are bound by the FMI's rules and agreements. Such "direct participants" and the management of the risks they present should be fully covered by the rules and agreements of the FMI and are generally dealt with in other principles in this report. The second type of relationship is with entities that are not bound by the rules of the FMI, but whose transactions are cleared, settled, or recorded by or through the FMI. These entities are defined as "indirect participants" in the FMI in this principle.

[135] The risk issues will vary depending on the type of FMI. For TRs, only operational risk will be relevant.

[136] See Principle 1 on legal basis.

complex series of financial intermediaries or agents, which may require the FMI to look beyond the direct participant and its immediate customer.

294. There are limits on the extent to which an FMI can, in practice, observe or influence direct participants' commercial relationships with their customers. However, an FMI will often have access to information on transactions undertaken on behalf of indirect participants and can set direct participation requirements that may include criteria relating to how direct participants manage relationships with their customers in-so-far as these criteria are relevant for the safe and efficient operation of the FMI. At a minimum, an FMI should identify the types of risk that could arise from tiered participation and should monitor concentrations of such risk. If an FMI or its smooth operation is exposed to material risk from tiered participation arrangements, the FMI should seek to manage and limit such risk.

Gathering and assessing information on risks arising from tiered participation arrangements

295. An FMI may be able to obtain information relating to tiered participation through its own systems or by collecting it from direct participants. An FMI should ensure that its procedures, rules, and agreements with direct participants allow it to gather basic information about indirect participants in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements. This information should enable the FMI, at a minimum, to identify (a) the proportion of activity that direct participants conduct on behalf of indirect participants, (b) direct participants that act on behalf of a material number of indirect participants, (c) indirect participants with significant volumes or values of transactions in the system, and (d) indirect participants whose transaction volumes or values are large relative to those of the direct participants through which they access the FMI.[137]

Understanding material dependencies in tiered participation arrangements

296. An FMI should identify material dependencies between direct and indirect participants that can affect the FMI. Indirect participants will often have some degree of dependency on the direct participant through which they access the FMI. In the case of an

[137] If satisfying this key consideration requires the collection of sensitive information that may advantage one party over another, the FMI should ensure that the sensitive information is appropriately protected and used only for risk purposes rather than commercial purposes.

FMI with few direct participants but many indirect participants, it is likely that a large proportion of the transactions processed by the FMI would depend on the operational performance of those few direct participants. Disruption to the services provided by the direct participants – whether for operational reasons or because of a participant's default – could therefore present a risk to the smooth functioning of the system as a whole. The FMI should identify and monitor material dependencies of indirect participants on direct participants so that the FMI has readily available information on which significant indirect participants may be affected by problems at a particular direct participant.

297. In some cases, issues at an indirect participant could affect the FMI. This is most likely to occur where a large indirect participant accesses an FMI's facilities through a relatively small direct participant. Failure of this significant indirect participant to perform as expected, such as by failing to meet its payment obligations, or stress at the indirect participant, such as that which causes others to delay payments to the indirect participant, may affect the direct participant's ability to meet its obligations to the FMI. FMIs should therefore identify and monitor the material dependencies of direct participants on indirect participants so that the FMI has readily available information on how the FMI may be affected by problems at an indirect participant, including which direct participants may be affected.

Credit and liquidity risks in tiered participation arrangements

298. Tiered participation arrangements typically create credit and liquidity exposures between direct and indirect participants. The management of these exposures is the responsibility of the participants and, where appropriate, subject to supervision by their regulators. An FMI is not expected to manage the credit and liquidity exposures between direct and indirect participants, although the FMI may have a role in applying credit or position limits in agreement with the direct participant. An FMI should, however, have access to information on concentrations of risk arising from tiered participation arrangements that may affect the FMI, allowing it to identify indirect participants responsible for a significant proportion of the FMI's transactions or whose transaction volumes or values are large relative to those of the direct participants through which they access the FMI. An FMI should identify and monitor such risk concentrations.

299. In a CCP, direct participants are responsible for the performance of their customers' financial obligations to the CCP. The CCP may, however, face an exposure to indirect participants (or arising from indirect participants' positions) if a direct participant defaults, at least until such time as the defaulting participant's customers' positions are ported to another

participant or closed out. If a participant default would leave the FMI with a potential credit exposure related to an indirect participant's positions, the FMI should ensure it understands and manages the exposure it would face. For example, the FMI may set participation requirements that require the direct participant, on the FMI's request, to demonstrate that it is adequately managing relationships with its customers to the extent that they may affect the FMI. An FMI should also consider establishing concentration limits on exposures to indirect participants, where appropriate.

Indirect participation and default scenarios

300. Default scenarios can create uncertainty about whether indirect participants' transactions have been settled or will be settled and whether any settled transactions will be unwound. Default scenarios can also raise legal and operational risks for the FMI if there is uncertainty about whether the indirect or direct participant is liable for completing the transaction. An FMI should ensure that a default, whether by a direct participant or by an indirect participant, does not affect the finality of indirect participants' transactions that have been processed and settled by the FMI. An FMI should ensure that its rules and procedures are clear regarding the status of indirect participants' transactions at each point in the settlement process (including the point at which they become subject to the rules of the system and the point after which the rules of the system no longer apply) and whether such transactions would be settled in the event of an indirect or direct participant default. An FMI should also ensure that it adequately understands its direct participants' processes and procedures for managing an indirect participant's default. For example, the FMI should know whether the indirect participant's queued payments can be removed or future-dated transactions rescinded and whether such processes and procedures would expose the FMI to operational, reputational, or other risks.

Encouraging direct participation

301. Direct participation in an FMI usually provides a number of benefits, some of which may not be available to indirect participants, such as real-time gross settlement, exchange-of-value settlement, or settlement in central bank money. Moreover, indirect participants are vulnerable to the risk that their access to an FMI, their ability to make and receive payments and their ability to undertake and settle other transactions is lost if the direct participant on whom these indirect participants rely defaults or declines to continue their business relationship. If these indirect participants have large values or volumes of business through the FMI, this may affect the smooth functioning of the FMI. For these reasons, where an

indirect participant accounts for a large proportion of the transactions processed by an FMI, it may be appropriate to encourage direct participation. For example, an FMI may in some cases establish objective thresholds above which direct participation would normally be encouraged (provided that the firm satisfies the FMI's access criteria). Setting such thresholds and encouraging direct participation should be based on risk considerations rather than commercial advantage.

Regular review of risks in tiered participation arrangements

302. An FMI should regularly review risks to which it may be exposed as a result of tiered participation arrangements. If material risks exist, the FMI should take mitigating action when appropriate. The results of the review process should be reported to the board of directors and updated periodically and after substantial amendments to an FMI's rules.

PS	CSD	SSS	CCP	TR
	●	●	●	●

Principle 20: FMI links

An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.

303. In reviewing this principle, it should be noted that the questions apply only to FMIs that have established links with one or more other FMIs. Additionally, the term "CSD" generally refers to a CSD that also operates an SSS. The use of this broader definition for CSD in this principle mirrors market convention in the discussion of FMI links. This principle should be reviewed in the context of Principle 8 on settlement finality, Principle 11 on CSDs, Principle 17 on operational risk, and other principles, as appropriate.

Key considerations

The following key consideration applies to	PS	CSD	SSS	CCP	TR
		●	●	●	●

1. *Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
		●	●	●	●

2. *A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
		●	●		

3. *Linked CSDs should measure, monitor, and manage the credit and liquidity risks arising from each other. Any credit extensions between CSDs should be covered fully with high-quality collateral and be subject to limits.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
		•	•		

4. *Provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
		•	•		

5. *An investor CSD should only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
		•	•		

6. *An investor CSD that uses an intermediary to operate a link with an issuer CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
				•	

7. *Before entering into a link with another CCP, a CCP should identify and manage the potential spillover effects from the default of the linked CCP.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
				•	

8. *Each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP's ability to fulfil its obligations to its own participants at any time.*

The following key consideration applies to	PS	CSD	SSS	CCP	TR
					•

9. *A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.*

Questions by key consideration

Key consideration 1:

Q.20.1.1: What process is used to identify potential sources of risk (such as, legal, credit, liquidity, custody, Sharī'ah and operational risks) arising from prospective links? How does this affect the FMI's decision whether to establish the link?

Q.20.1.2: What links have been established with other FMIs? How does the FMI identify, monitor and manage the risks arising from an established link on an ongoing basis?

Q.20.1.3: How does the FMI ensure that link arrangements are designed so that it is able to remain observant of the other principles? How frequently is this analysis conducted?

Key consideration 2:

Q.20.2.1: In which jurisdictions has the FMI established links? What are the relevant legal frameworks supporting the established links?

Q.20.2.2: How does the FMI ensure that its links have a well-founded legal basis that support its design and provide it with adequate protection in all relevant jurisdictions? How does the FMI ensure that such protections are maintained over time?

Key consideration 3:

Q.20.3.1: What processes are in place to measure, monitor and manage credit and liquidity risks arising from any established links?

Q.20.3.2: If a CSD extends credit to a linked CSD, what processes exist to ensure that credit extensions to the linked CSD are fully covered by high-quality collateral and that credit limits are appropriate?

Key consideration 4:

Q.20.4.1: Are provisional transfers of securities allowed across the link? If so, what arrangements make provisional transfers necessary, and is the retransfer of these securities prohibited until the first transfer is final?

Key consideration 5:

Q.20.5.1: For any established link, how has the investor CSD determined that the rights of its participants have a high level of protection?

Q.20.5.2: How frequently is reconciliation of holdings conducted by the entities holding the securities in custody?

Q.20.5.3: How does the investor CSD provide a high-level of protection for the rights of its participants (including segregation and portability arrangements and asset protection provisions for omnibus accounts)?

Key consideration 6:

Q.20.6.1: If the CSD uses an intermediary to operate a link, what are the criteria used by the CSD to select the intermediary or intermediaries? Are these criteria risk-based?

Q.20.6.2: What are the respective liabilities of the two linked CSDs and the intermediaries?

Q.20.6.3: What processes exist to measure, monitor and manage the risks arising from use of the intermediary?

Key consideration 7:

Linked CCP default

Q.20.7.1: Prior to establishing any links, what analysis was undertaken by the CCP to identify and assess the spillover effects of a linked CCP's default?

Q.20.7.2: How does the CCP manage any identified spillover effects of a linked CCP's default?

Collective link arrangements (three or more CCPs)

Q.20.7.3: Prior to establishing any links, what analysis was conducted by the CCP to identify and assess the potential spillover effects of a link arrangement involving three or more CCPs?

Q.20.7.4: In the case of collective link arrangements, what processes are in place for the CCP to identify, assess and manage risks arising from the collective link arrangement? In the case of links between CCPs, is there a clear definition of the respective rights and obligations of the different CCPs?

Key consideration 8:

Exposures and coverage of exposures

Q.20.8.1: What processes are in place to measure, monitor and manage inter-CCP exposures?

Q.20.8.2: How does the CCP ensure, on an ongoing basis, that it can cover its current exposure fully?

Q.20.8.3: How does the CCP ensure that it covers its potential future exposure with a high degree of confidence, without reducing its ability to fulfil its own obligations?

Management of risks

Q.20.8.4: What arrangements do the linked CCPs have in place to manage the risks arising from the link (such as a separate default fund, increased collateral requirements or contributions to each other's default funds)?

Q.20.8.5: If the CCPs contribute to each other's default funds, how is it ensured that the contribution to another CCP's default fund does not affect the ability of the CCP to fulfil its obligations to its own participants at any time?

Information provided to participants

Q.20.8.6: How do the linked CCPs ensure that participants are informed about their exposures to the potential sharing of uncovered losses and uncovered liquidity shortfalls from the link arrangement?

Key consideration 9:

Q.20.9.1: How does the TR ensure the scalability and reliability of its IT and related resources to take into account the additional operational risks associated with a link to another FMI? How frequently does the TR validate the adequacy of its scalability and reliability?

Explanatory note

304. A link is a set of contractual and operational arrangements between two or more FMIs that connect the FMIs directly or through an intermediary. An FMI may establish a link with a similar type of FMI for the primary purpose of expanding its services to additional financial instruments, markets, or institutions.[138] For example, a CSD (referred to as an "investor CSD") may establish a link to another CSD in which securities are issued or immobilised (referred to as an "issuer CSD") to enable a participant in the investor CSD to access the services of the issuer CSD through the participant's existing relationship with the investor CSD.[139] A CCP may establish a link with another CCP to enable a participant in the first CCP to clear trades with a participant in the second CCP through the participant's existing relationship with the first CCP. An FMI may also establish a link with a different type of FMI. For example, a CCP for securities markets must establish and use a link to a CSD to receive and deliver securities. This principle covers links between CSDs, CCPs, and TRs, as well as CSD–CCP links and links between

[138] FMIs in all link arrangements should meet the requirement in key consideration 1 of Principle 18. Open access to other FMIs can be a pre-condition for the establishment of links between FMIs of the same type.

[139] The term "CSD" in this principle generally refers to a CSD that also operates an SSS. The use of this broader definition for CSD in this principle mirrors market convention in the discussion of FMI links.

TRs and other FMIs.[140] If an FMI establishes a link, it should identify, monitor, and manage its links-related risks, including legal, operational, credit, Sharīʿah[141] and liquidity risks.[142] Further, an FMI that establishes multiple links should ensure that the risks generated in one link do not affect the soundness of the other links and linked FMIs. Mitigation of such spillover effects requires the use of effective risk management controls, including additional financial resources or the harmonisation of risk management frameworks across linked FMIs. An FMI should also take into consideration the risk that may arise from a linked FMI being subject to operational disruption, possibly on a prolonged basis.

Identifying link-related risks

305. Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify and assess all potential sources of risk arising from the link arrangement. The type and degree of risk varies according to the design and complexity of the FMIs and the nature of the relationship between them. In a simple case of a vertical link, for example, an FMI may provide basic services to another FMI, such as a CSD that provides securities transfer services to an SSS. Such links typically pose only operational and custody risks. Other links, such as an arrangement in which a CCP provides clearing services to another CCP, may be more complex and may pose additional risk to FMIs, such as credit and liquidity risk.[143] Cross-collateral by two or more CCPs may also pose additional risk because the CCPs may rely on each other's risk management systems to measure, monitor, and manage credit and liquidity risk (see Principle 6 on calculation of collateral). In addition, links between different types of FMIs may pose specific risks to one or all of the FMIs in the link arrangement. For example, a CCP may have a link with a CSD that operates an SSS for the delivery of securities and settlement of collaterals. If the CCP poses risks to the CSD, the CSD

[140] Links to payment systems are not addressed by this principle because these links are addressed in Principle 9 on money settlements.

[141] An FMI that establishes a link is exposed to possible Sharīʿah risk that may result from different Sharīʿah interpretations (e.g. cross-collateral between CCPs).

[142] Prior to entering a link arrangement, an FMI should inform its participants of the expected effects on the FMI's risk profile. See also Principle 23 on disclosure of rules, key procedures, and market data.

[143] A link between two or more CCPs may enable participants in a CCP in one market to clear transactions in another market through their existing arrangements. By broadening trading opportunities for market participants, without imposing all of the costs normally associated with establishing clearing relationships, links can deepen the liquidity in the affected markets. A link may also reduce the costs of systems development and operation faced by CCPs because it enables them to share these expenses.

should manage those risks. In all cases, link arrangements should be designed such that each FMI is able to observe the other principles in this report.

Managing legal risks

306. A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link. Cross-border links may present legal risk arising from differences between the laws, Sharīʿah interpretation, and contractual rules governing the linked FMIs and their participants, including those relating to rights and interests, collateral arrangements, settlement finality, and netting arrangements (see Principle 1 on legal basis and Principle 25 on Sharīʿah governance). For example, differences in law and rules governing settlement finality may lead to a scenario where a transfer is regarded as final in one FMI but not final in the linked FMI. In some jurisdictions, differences in laws may create uncertainties regarding the enforceability of CCP obligations assumed by novation, open offer, or other similar legal device. Differences in insolvency laws may unintentionally give a participant in one CCP a claim on the assets or other resources of the linked CCP in the event of the first CCP's default. To limit these uncertainties, the respective rights and obligations of the linked FMIs and, where necessary, their participants should be clearly defined in the link agreement. The terms of the link agreement should also set out, in cross-jurisdictional contexts, an unambiguous choice of law that will govern each aspect of the link.

Managing operational risk

307. Linked FMIs should provide an appropriate level of information about their operations to each other in order for each FMI to perform effective periodic assessments of the operational risk associated with the link. In particular, FMIs should ensure that risk-management arrangements and processing capacity are sufficiently scalable and reliable to operate the link safely for both the current and projected peak volumes of activity processed over the link (see Principle 17 on operational risk). Systems and communication arrangements between linked FMIs also should be reliable and secure so that the link does not pose significant operational risk to the linked FMIs. Any reliance by a linked FMI on a critical service provider should be disclosed as appropriate to the other FMI. In addition, a linked FMI should identify, monitor, and manage operational risks due to complexities or inefficiencies associated with differences in time zones, particularly as these affect staff availability. Governance arrangements and change-management processes should ensure that changes in one FMI will not inhibit the smooth functioning of the link, related risk-management arrangements, or

non-discriminatory access to the link (see Principle 2 on governance and Principle 18 on access and participation requirements).

Managing financial risk

308. FMIs in a link arrangement should effectively measure, monitor, and manage their financial risk, including custody risk, arising from the link arrangement. FMIs should ensure that they and their participants have adequate protection of assets in the event of the insolvency of a linked FMI or a participant default in a linked FMI. Specific guidance on mitigating and managing these risks in CSD–CSD links and CCP–CCP links is provided below.

CSD–CSD links

309. As part of its activities, an investor CSD may choose to establish a link with another CSD. If such a link is improperly designed, the settlement of transactions across the link could subject participants to new or increased risks. In addition to legal and operational risks,linked CSDs and their participants could also face credit and liquidity risks. For example, an operational failure or default in one CSD may cause settlement failures or defaults in a linked CSD and expose participants in the linked CSD, including participants that did not settle transactions across the link, to unexpected liquidity pressures or outright losses. A CSD's default procedures, for example, could affect a linked CSD through loss-sharing arrangements. Linked CSDs should identify, monitor, and manage the credit and liquidity risks arising from the linked entity. In addition, any credit extensions between CSDs should be covered fully by high-quality collateral and be subject to limits.[144] Further, some practices deserve particularly rigorous attention and controls. In particular, provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.

[144] In exceptional cases, other adequate collateral may be used to secure credit extensions between CSDs subject to the review and assessment by the relevant authorities. See also Principle 4 on credit risk, Principle 5 on collateral, and Principle 7 on liquidity risk.

310. An investor CSD should only establish links with an issuer CSD if the link arrangement provides a high level of protection for the rights of the investor CSD's participants. In particular, the investor CSD should use issuer CSDs that provide adequate protection of assets in the event that the issuer CSD becomes insolvent (see Principle 11 on CSDs). In some cases, securities held by an investor CSD can be subject to attachment by the creditors of the CSD or its participants and, as such, can also be subject to freezing or blocking instructions from local courts or other authorities. Further, if an investor CSD maintains securities in an omnibus account at an issuer CSD and a participant at the investor CSD defaults, the investor CSD should not use the securities belonging to other participants to settle subsequent local deliveries of the defaulting participant. The investor CSD should have adequate measures and procedures to avoid effects on the use of securities belonging to non-defaulting participants in a participant-default scenario.

311. Furthermore, linked CSDs should have robust reconciliation procedures to ensure that their respective records are accurate and current. Reconciliation is a procedure to verify that the records held by the linked CSDs match for transactions processed across the link. This process is particularly important when three or more CSDs are involved in settling transactions (i.e. the securities are held in safekeeping by one CSD or custodian while the seller and the buyer participate in one or more of the linked CSDs) (see also Principle 11 on CSDs).

Indirect CSD–CSD links

312. If an investor CSD uses an intermediary to operate a link with an issuer CSD, the investor CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary. In an indirect CSD–CSD link, an investor CSD uses an intermediary (such as a custodian bank) to access the issuer CSD. In such cases, the investor CSD faces the risk that the custodian bank may become insolvent, act negligently, or commit fraud. Although an investor CSD may not face a loss on the value of the securities, the ability of the investor CSD to use its securities might temporarily be impaired. The investor CSD should measure, monitor, and manage on an ongoing basis its custody risk (see also Principle 16 on custody and investment risks) and provide evidence to the relevant authorities that adequate measures have been adopted to mitigate this custody risk. In addition, the investor CSD should ensure that it has adequate legal, contractual, and operational protections to ensure that its assets held in custody are segregated and transferable (see Principle 11 on CSDs). Similarly, an investor CSD should ensure that its settlement banks or cash correspondents can perform as expected. In that

context, the investor CSD should have adequate information on the business continuity plans of its intermediary and the issuer CSD to achieve a high degree of confidence that both entities will perform as expected during a disruptive event.

CCP–CCP links

313. A CCP may establish links with one or more other CCPs. Although the details of individual link arrangements among CCPs differ significantly because of the varied designs of CCPs and the markets they serve, there are currently two basic types of CCP links: peer-to-peer links and participant links.

314. In a peer-to-peer link, a CCP maintains special arrangements with another CCP and is not subject to normal participant rules. Typically, however, the CCPs exchange collateral andother financial resources on a reciprocal basis. The linked CCPs face current and potential future exposures to each other as a result of the process whereby they each net the trades cleared between their participants so as to create novated (net) positions between the CCPs. Risk management between the CCPs is based on a bilaterally approved framework, which is different from that applied to a normal participant.

315. In a participant link, one CCP (the participant CCP) is a participant in another CCP (the host CCP) and is subject to the host CCP's normal participant rules. In such cases, the host CCP maintains an account for the participant CCP and would typically require the participant CCP to provide collateral, as would be the case for a participant that is not a CCP. Aparticipant CCP should mitigate and manage its risk from the link separately from the risks in its core clearing and settlement activities. For example, if the host CCP defaults, the participant CCP may not have adequate protection because the participant CCP does not hold collateral from the host CCP to mitigate the counterparty risk posed to it by the host CCP. Risk protection in a participant link is one-way, unlike in a peer-to-peer link. The participant CCP that provides collateral but does not collect collateral from another linked CCP should therefore hold additional financial resources to protect itself against the default of the host CCP.

316. Both types of links – peer-to-peer and participant links – may present new or increased risks that should be measured, monitored, and managed by the CCPs involved in the link. The most challenging issue with respect to CCP links is the risk management of the financial exposures that potentially arise from the link arrangement. Before entering into a link with another CCP, a CCP should identify and assess the potential spillover effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify and

assess the risks of the collective link arrangement. A network of links between CCPs that does not properly acknowledge and address the inherent complexity of multi-CCP links could have significant implications for systemic risk.

317. Exposures faced by one CCP from a linked CCP should be identified, monitored, and managed with the same rigour as exposures from a CCP's participants to prevent a default at one CCP from triggering a default at a linked CCP. Such exposures should be covered fully, primarily through the use of collateral or other equivalent financial resources. In particular, each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP's ability to fulfil its obligations to its own participants at any time (see Principle 6 on calculation of collateral). Financial resources used to cover inter-CCP current exposures should be prefunded with highly liquid assets that exhibit low credit risk. Best practice is for CCPs to have near real-time inter-CCP risk management. However, at a minimum, financial exposures among linked CCPs should be marked to market and covered on a daily basis. CCPs also need to consider and address the risks arising from links in designing their stress tests and calibrating their prefunded default arrangements. Linked CCPs should also take into account the effects that possible contributions to each other's prefunded default arrangements, exchange of collateral, common participants, major differences in their risk management tools, and other relevant features may have on their risk management frameworks, especially in relation to the legal, credit, liquidity, and operational risks they face.

318. Because of the different possible types of link arrangements, different types of CCPs, and differences in the legal and regulatory frameworks in which CCPs may operate, different combinations of risk management tools may be used by the CCP. When linked CCPs have materially different risk management frameworks, the risks stemming from the link are more complex. In this case, the linked CCPs should carefully assess the effectiveness of their risk management models and methodologies, including their default procedures, in order to determine whether and to what extent their inter-CCP risk-management frameworks should be harmonised or whether additional risk-mitigation measures would be sufficient to mitigate risks arising from the link.

319. A CCP (the first CCP) will usually have to provide collateral to a linked CCP for open positions. In some cases, the first CCP may not be able to provide collateral that it has collected from its participants to the linked CCP because the first CCP's rules may prohibit the use of its participants' collateral for any purpose other than to cover losses from a default

ofa participant in the first CCP, or the first CCP's legal or regulatory requirements may not permit such use of its participants' collateral. As such, the CCP would need to use alternative financial resources to cover its counterparty risk to the linked CCP, which is normally covered by collateral. If a CCP, subject to participants' agreement, is allowed to use its participants' collateral to meet an inter-CCP collateral requirement, such collateral provided by the first CCP must be unencumbered and its use by the linked CCP in the event of the default of the first CCP must not be constrainable by actions taken by the participants of the first CCP. The credit and liquidity risk arising from the use of collateral should be adequately mitigated by the CCPs. This can be achieved through segregation, protection, and custody of collateral exchanged between CCPs in a manner that allows for its swift and timely return to the CCP in case of a decrease in the exposures and that allows for supplemental collateral (and, if necessary, supplemental default fund contributions) needed to cover the counterparty risk between the linked CCPs to be charged directly to the participants who use the link service, if applicable.

320. Linked CCPs should maintain arrangements that are effective in managing the risks arising from the link; such arrangements often involve a separate default fund to cover that risk. In principle, the risk management measures related to the link should not reduce the resources that a CCP holds to address other risks. The most direct way to achieve this outcome is for CCPs not to participate in each other's default funds, which may in turn mean that the CCP will need to provide additional collateral. However, in arrangements in which CCPs have agreed, consistent with their regulatory framework, to contribute to each other's default funds, the linked CCPs should assess and mitigate the risks of making such contributions via specific conditions. In particular, funds used by a CCP to contribute to another CCP's default fund must represent prefunded additional financial resources and must not include resources used by the CCP to satisfy its regulatory requirements to hold sufficient capital or participant collateral funds (or any other funds, including independent default fund resources) held by the CCP to mitigate the counterparty risk presented by its participants. The contributing CCP should further ensure that any consequent exposure of its own participants to the risk of a participant default in the linked CCP is fully transparent to and understood by its participants. The contributing CCPs may, for example, consider it appropriate to ensure the default fund contribution is made only by those of its participants that use the link, if applicable. Moreover, the resources provided by one CCP to another should be held in such a way that they are ring fenced from other resources provided to that CCP. For example, securities could be held in a separate account at a custodian. Cash would need to be held in

segregated accounts to be considered as acceptable collateral in this case.[145] Finally, in case of a participant default in the first CCP, the use of the linked CCP's contribution to the default fund of the first CCP could be restricted or limited. For example, the linked CCP's contribution to the default fund could be put at the bottom of the first CCP's default waterfall.

321. Link arrangements between CCPs will expose each CCP to sharing in potentially uncovered credit losses if the linked CCP's default waterfall has been exhausted. For example, a CCP may be exposed to loss mutualisation from defaults of a linked CCP's participants. This risk will be greater to the extent that the first CCP is unable directly to monitor or control the other CCP's participants. Such contagion risks can be even more serious in cases where more than two CCPs are linked, directly or indirectly, and a CCP considering such a link should satisfy itself that it can manage such risks adequately. Each CCP should ensure that the consequent exposure of its own participants to a share in these uncovered losses is fully understood and disclosed to its participants. CCPs may consider it appropriate to devise arrangements to avoid sharing in losses that occur in products other than those cleared through the link and to confine any loss sharing to only participants that clear products through the link. Depending on how losses would be shared, CCPs may need to increase financial resources to address this risk.

322. Any default fund contributions or allocation of uncovered losses should be structured to ensure that (a) no linked CCP is treated less favourably than the participants of the other CCP, and (b) each CCP's contribution to the loss-sharing arrangements of the other is no more than proportionate to the risk the first CCP poses to the linked CCP.

Special considerations for TR links

323. TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources. A TR can establish links with another TR or with another type of FMI. Such links may expose the linked FMIs to additional risks if not properly designed. Besides legal risks, a link to either another TR or to another type of FMI may involve the potential spillover of operational risk. The mitigation of operational risk is particularly important because the information maintained by a TR can support bilateral

[145] In some jurisdictions, the legal framework will not protect the segregation of cash on the books of a commercial bank.

netting and be used to provide services directly to market participants, service providers, and other linked FMIs. FMIs establishing a link to a TR should ensure that the system and communication arrangements between the linked entities are reliable and secure such that the operation of the link does not pose significant reliability and security risks. Therefore, the scalability of IT and related resources may be especially important.

Efficiency

PS	CSD	SSS	CCP	TR
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Principle 21: Efficiency and effectiveness

An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

324. This principle should be reviewed in the context of Principle 17 on operational risk, Principle 18 on access and participation requirements, Principle 22 on communication procedures and standards, and other principles, as appropriate.

Key considerations

1. *An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.*

2. *An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk management expectations, and business priorities.*

3. *An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.*

Questions by key consideration

Key consideration 1:

Q.21.1.1: How does the FMI determine whether its design (including its clearing and settlement arrangement, its operating structure, its delivery systems and

technologies, and its individual services and products) is taking into account the needs of its participants and the markets it serves?

Q.21.1.2: Does the FMI have an up-to-date understanding of the technologies that may improve its efficiency and effectiveness, or impact on competition in the market? How does it keep these technologies under review?

Q.21.1.3: How does the FMI determine whether it is meeting the requirements and needs of its participants and other users and continues to meet those requirements as they change (e.g. through the use of feedback mechanisms)?

Key consideration 2:

Q.21.2.1: What are the FMI's goals and objectives as far as the effectiveness of its operations is concerned?

Q.21.2.2: How does the FMI ensure that it has clearly defined goals and objectives that are measurable and achievable?

Q.21.2.3: To what extent have the goals and objectives been achieved? What mechanisms does the FMI have to measure and assess this?

Key consideration 3:

Q.21.3.1: What processes and metrics does the FMI use to evaluate its efficiency and effectiveness?

Q.21.3.2: How frequently does the FMI evaluate its efficiency and effectiveness?

Explanatory note

325. An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves, while also maintaining appropriate standards of safety and security

as outlined in the principles in this report.[146] "Efficiency" refers generally to the resources required by the FMI to perform its functions, while "effectiveness" refers to whether the FMI is meeting its intended goals and objectives. An FMI that operates inefficiently or functions ineffectively may distort financial activity and the market structure, increasing not only the financial and other risks of an FMI's participants, but also the risks of their customers and end users. If an FMI is inefficient, a participant may choose to use an alternate arrangement that poses increased risks to the financial system and the broader economy. The primary responsibility for promoting the efficiency and effectiveness of an FMI belongs to its owners and operators.

Efficiency

326. Efficiency is a broad concept that encompasses what an FMI chooses to do, how it does it, and the resources required. An FMI's efficiency depends partly on its choice of a clearing and settlement arrangement (e.g. gross, net, or hybrid settlement; real time or batch processing; and novation or guarantee scheme); operating structure (e.g. links with multiple trading venues or service providers); scope of products cleared, settled, or recorded; and use of technology and procedures (e.g. communication procedures and standards). In designing an efficient system, an FMI should also consider the practicality and costs for participants, their customers, and other relevant parties (including other FMIs and service providers).[147] Furthermore, the FMI's technical arrangements should be sufficiently flexible to respond to changing demand and new technologies. Fundamentally, an FMI should be designed and operated to meet the needs of its participants and the markets it serves.[148] An FMI's efficiency will ultimately affect the use of the FMI by its participants and their customers as well as these entities' ability to conduct robust risk management, which may affect the broader efficiency of financial markets.

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[146] There may be different ways for an FMI to meet a particular principle, but the objective of a particular principle should not be compromised.

[147] For a system to be practical for users, it needs to take into account the structure of the local market and its history and conventions. The system also must reflect the current and prospective costs of the inputs used as well as evolving technologies. Designing a system that appropriately meets the needs of its users will often require an understanding of local practices and technologies.

[148] One mechanism an FMI might use to gauge its success in meeting the needs of its participants and the markets it serves are periodic satisfaction surveys of its participants and other relevant institutions in the market.

327. Efficiency also involves cost control. An FMI should establish mechanisms for the regular review of its efficiency, including its costs and pricing structure.[149] An FMI should control its direct costs, such as those stemming from transaction processing, money settlement, and settlement-entry preparation and execution. An FMI also should consider and control its indirect costs. These include infrastructure, administrative, and other types of costs associated with operating the FMI. Some indirect costs (and risks) may be lessapparent. For example, an FMI may need to consider its participants' liquidity costs, which include the amount of cash or other financial instruments that a participant must provide to the FMI, or other parties, in order to process its transactions, and the opportunity cost of providing such assets. An FMI's design has a significant impact on the liquidity costs borne by participants, which, in turn, affect the FMI's costs and risks. Cost considerations, however,should always be balanced against appropriate standards of safety and security as outlinedin the principles in this report.

328. Competition can be an important mechanism for promoting efficiency. Where there is effective competition and participants have meaningful choices among FMIs, such competition may help to ensure that FMIs are efficient. FMIs should ensure, however, that they adhere to appropriate standards of safety and security as outlined in the principles in this report. Both private and central bank operators of FMIs should make use of market disciplines, as appropriate, to promote efficiency in the FMI's operations. For example, an FMI could use competitive tendering to select service providers. Where competition may be difficult to maintain because of economies of scale or scope, and an FMI therefore enjoys some form of market power over the service it provides, relevant authorities may have a responsibility to review the costs imposed on the FMI's participants and the markets it serves.

Effectiveness

329. An FMI is effective when it reliably meets its obligations in a timely manner and achieves the public policy goals of safety and efficiency for participants and the markets it

[149] A review of an FMI's efficiency or cost-effectiveness could include an evaluation of both the productivity of operational processes and the relative benefits of the processing method given the corresponding costs. For example, an efficiency review could include analysing the number of transactions that could be processed in a given period or by measuring the processing cost per transaction.

serves. In the context of oversight and auditing, an FMI's effectiveness may also involve meeting service and security requirements. To facilitate assessments of effectiveness, an FMI should have clearly defined goals and objectives that are measurable and achievable. For example, an FMI should set minimum service-level targets (such as the time it takes to process a transaction), risk management expectations (such as the level of financial resources it should hold), and business priorities (such as the development of new services). An FMI should establish mechanisms for the regular review of its effectiveness, such as periodic measurement of its progress against its goals and objectives.

330. For a TR to be effective, its goals and objectives should include timeliness and accuracy. A TR should promptly record the transaction information it receives from its participants. To ensure the accuracy and timeliness of data, a TR should employ efficient record-keeping procedures to document changes to recorded transaction information resulting from subsequent post-trade events. Ideally, a TR should set a service-level target to record to its central registry transaction information it receives from participants in real time, and at a minimum, within one business day. A TR should have adequate procedures and timelines for making data available for any downstream processing and should implement quality controls to ensure the accuracy, validity, and integrity of the data it stores and disseminates. In addition, a TR should have effective processes and procedures for the provision of data to relevant authorities (see also Principle 24).

331. Rapid advances in financial services information technology (sometimes grouped together under the term "Fintech") have opened up a large number of possibilities for improvements in efficiency and effectiveness. They may also in some cases facilitate new entrants to the markets. An FMI should keep these new technologies under review and determine which of them may have the capacity to improve its efficiency or the services it offers to participants.

PS	CSD	SSS	CCP	TR
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Principle 22: Communication procedures and standards

An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.

332. This principle should be reviewed in the context of Principle 17 on operational risk, Principle 21 on efficiency and effectiveness, and other principles, as appropriate.

Key consideration

1. *An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.*

Questions by key consideration

Key consideration 1:

Communication procedures

Q.22.1.1: Does the FMI use an internationally accepted communications procedure and, if so, which one(s)? If not, how does the FMI accommodate internationally accepted communication procedures?

Q.22.1.2: If the FMI engages in cross-border operations, how do the FMI's operational procedures, processes and systems use or otherwise accommodate internationally accepted communication procedures for cross-border operations?

Communication standards

Q.22.1.3: Does the FMI use an internationally accepted communications standard and, if so, which one(s)? If not, how does the FMI accommodate internationally accepted communication standards?

Q.22.1.4: If the FMI engages in cross-border operations, how do the FMI's operational procedures, processes and systems use or otherwise accommodate internationally accepted communication standards for cross-border operations?

Q.22.1.5: If no international standard is used, how does the FMI accommodate systems that translate or convert message format and data from international standards into the domestic equivalent and vice versa?

Explanatory note

333. The ability of participants to communicate with an FMI in a timely, reliable, and accurate manner is key to achieving efficient payment, clearing, settlement, and recording. An FMI's adoption of internationally accepted communication procedures and standards for its core functions can facilitate the elimination of manual intervention in clearing and settlement processing, reduce risks and transaction costs, improve efficiency, and reduce barriers to entry into a market. Therefore, an FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards to ensure effective communication between the FMI and its participants, their customers, and others that connect to the FMI. An FMI is encouraged but not required to use or accommodate internationally accepted communication procedures and standards for purely domestic transactions.

Communication procedures

334. An FMI should use, or at a minimum accommodate, internationally accepted communication procedures to facilitate effective communication between the FMI's information systems, and those of its participants, their customers, and others that connect to the FMI (such as third-party service providers and other FMIs). Standardised communication procedures (or protocols) provide a common set of rules across systems for exchanging messages. These rules allow for a broad set of systems and institutions in various locations to communicate efficiently and effectively. Reducing the need for intervention and technical complexity when processing transactions can help to reduce the number of errors, avoid information losses, and ultimately reduce the resources needed for data processing by the FMI, its participants, and markets generally.

Communication standards

335. An FMI should use, or at a minimum accommodate, internationally accepted communication standards, such as standardised messaging formats and reference data standards for identifying financial instruments and counterparties. The use of internationally accepted standards for message formats and data representation will generally improve the quality and efficiency of the clearing and settlement of financial transactions. If an FMI does not itself use internationally accepted communication standards, it should typically accommodate systems that translate or convert data from international standards into the domestic equivalent and vice versa.

Cross-border considerations

336. An FMI that conducts payment, clearing, settlement, or recording activities across borders should use internationally accepted communication procedures and standards or, at a minimum, accommodate them. An FMI that, for example, settles a chain of transactions processed through multiple FMIs or provides services to users in multiple jurisdictions should strongly consider using internationally accepted communication procedures and standards to achieve efficient and effective cross-border financial communication. Furthermore, adopting these communication procedures can facilitate interoperability between the information systems or operating platforms of FMIs in different jurisdictions, which allows market participants to obtain access to multiple FMIs without facing technical hurdles (such as having to implement or support multiple local networks with different characteristics). An FMI that operates across borders also should be able to support and use well-established communication procedures, messaging standards, and reference data standards relating to counterparty identification and securities numbering processes. For example, relevant standards promulgated by the International Organization for Standardization should be carefully considered and adopted by an FMI. If an FMI that operates across borders does not fully adopt international procedures and standards, it can still potentially interoperate with the information systems or operating platforms of other FMIs by developing systems to translate or convert international procedures and standards into the domestic equivalent, and vice versa.

Use of internationally accepted procedures and standards by TRs

337. Communication procedures and standards are particularly important for TRs that serve as a central data source for a variety of stakeholders potentially located in many jurisdictions. A TR should support technologies that are widely accepted in the market,

including applicable market standards for reporting and recording trade information. A TR also should apply consistent application interfaces and communication links that enable technical interconnectivity with other FMIs and service providers. A TR should be able to directly exchange trade information not only with market participants but also with other entities such as exchanges, electronic trading venues, confirmation-matching platforms, CCPs, and other service providers. A TR should use industry standards for data representation, including those related to the unique identification of counterparties (such as legal entity identifiers) to facilitate the use and aggregation of data stored in the repository, especially by authorities.[150]

[150] Legal entity identifiers (LEIs) contribute to the ability of authorities to fulfil the systemic risk mitigation, transparency, and market abuse protection goals established by G20 commitments and would improve efficiency and transparency in many other areas.

Transparency

PS	CSD	SSS	CCP	TR
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Principle 23: Disclosure of rules, key procedures, and market data

An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.

338. In reviewing this principle, information should be disclosed to the extent that it would not risk prejudicing the security and integrity of the FMI or divulging commercially sensitive information. This principle should be reviewed in the context of Principle 8 on settlement finality, Principle 13 on participant default rules and procedures, Principle 24 on the disclosure of market data by trade repositories, and other principles, as appropriate.

Key considerations

1. *An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.*

2. *An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.*

3. *An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.*

4. *An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.*

5. *An FMI should complete regularly and disclose publicly responses to the disclosure framework for Islamic financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.*

6. *If an FMI is involved in a process of paying zakāh, other Sharīʿah-related payments, or purification of income on behalf of its participants, it should make an appropriate public disclosure on how these activities are being conducted.*

Questions by key consideration

Key consideration 1:

Rules and procedures

Q.23.1.1: What documents comprise the FMI's rules and procedures? How are these documents disclosed to participants?

Q.23.1.2: How does the FMI determine that its rules and procedures are clear and comprehensive?

Disclosure

Q.23.1.3: What information do the FMI's rules and procedures contain on the procedures it will follow in non-routine, though foreseeable, events?

Q.23.1.4: How and to whom does the FMI disclose the processes it follows for changing its rules and procedures?

Q.23.1.5: How does the FMI disclose relevant rules and key procedures to the public?

Key consideration 2:

Q.23.2.1: What documents comprise information about the system's design and operations? How and to whom does the FMI disclose the system's design and operations?

Q.23.2.2: How and to whom does the FMI disclose the degree of discretion it can exercise over key decisions that directly affect the operation of the system?

Q.23.2.3: What information does the FMI provide to its participants about their rights, obligations and risks incurred through participation in the FMI?

Key consideration 3:

Q.23.3.1: How does the FMI facilitate its participants' understanding of the FMI's rules, procedures and the risks associated with participating?

Q.23.3.2: Is there evidence that the means described above enable participants' understanding of the FMI's rules, procedures and the risks they face from participating in the FMI?

Q.23.3.3: In the event that the FMI identifies a participant whose behaviour demonstrates a lack of understanding of the FMI's rules, procedures and the risks of participation, what remedial actions are taken by the FMI?

Key consideration 4:

Q.23.4.1: Does the FMI publicly disclose its fees at the level of its individual services and policies on any available discounts? How is this information disclosed?

Q.23.4.2: How does the FMI notify participants and the public, on a timely basis, of changes to services and fees?

Q.23.4.3: Does the FMI provide a description of its priced services? Do these descriptions allow for comparison across similar FMIs?

Q.23.4.4: Does the FMI disclose information on its technology and communication procedures, or any other factors that affect the costs of operating the FMI?

Key consideration 5:

Q.23.5.1: When did the FMI last complete the disclosure framework for Islamic financial market infrastructures? How frequently is it updated? Is it updated following material changes to the FMI and its environment and, at a minimum, every two years?

Q.23.5.2: What quantitative information does the FMI disclose to the public? How often is this information updated?

Q.23.5.3: What other information does the FMI disclose to the public?

Q.23.5.4: How does the FMI disclose this information to the public? In which language(s) are the disclosures provided?

Key consideration 6:

Q.23.6.1: If an FMI is involved in a process of paying *zakāh*, other Sharī'ah-related payments, or purification of income on behalf of its participants, what kind of information does the FMI provide to its participants? What are the Sharī'ah governance arrangements in place to conduct such activities?

Explanatory note

339. An FMI should provide sufficient information to its participants and prospective participants to enable them to identify clearly and understand fully the risks and responsibilities of participating in the system. To achieve this objective, an FMI should adopt and disclose written rules and procedures that are clear and comprehensive and that include explanatory material written in plain language so that participants can fully understand the system's design and operations, their rights and obligations, and the risks of participating in the system. An FMI's rules, procedures, and explanatory material need to be accurate, up-to-date, and readily available to all current and prospective participants. Moreover, an FMI should disclose to participants and the public information on its fee schedule, basic operational information, and responses to the disclosure framework for Islamic financial market infrastructures.

340. Adhering to Sharī'ah requirements is what distinguishes the Islamic capital market from the conventional one; hence, an FMI should disclose as appropriate the Islamic finance specificities pertaining to its operations, which include the structure of the prefunded financial resources, its investment policy, acceptable collateral, treatment of income generated from

collateral, Islamic repurchase agreements,[151] and the mechanism of imposing any late payment fee on its participants.

Rules and procedures

341. An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed. An FMI's rules and procedures are typically the foundation of the FMI and provide the basis for participants' understanding of the risks they incur by participating in the FMI. As such, relevant rules and procedures should include clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risk they would incur by participating in the FMI.[152] They should clearly outline the respective roles of participants and the FMI as well as the rules and procedures that will be followed in routine operations and non-routine, though foreseeable, events, such as a participant default (see Principle 13 on participant-default rules andprocedures). In particular, an FMI should have clear and comprehensive rules and procedures for addressing financial and operational problems within the system.

342. In addition to disclosing all relevant rules and key procedures, an FMI should have a clear and fully disclosed process for proposing and implementing changes to its rules and procedures and for informing participants and relevant authorities of these changes. Similarly, the rules and procedures should clearly disclose the degree of discretion that an FMI can exercise over key decisions that directly affect the operation of the system, including in crises and emergencies (see also Principle 1 on legal basis, Principle 2 on governance and Principle 25 on Sharī'ah governance). For example, an FMI's procedures may provide for discretion regarding the extension of operating hours to accommodate unforeseen market or operational problems. An FMI also should have appropriate procedures to minimise any conflict-of-interest issues that may arise when authorised to exercise its discretion.

[151] An FMI that manages/arranges repurchase agreements should do so in accordance to the relevant Sharī`ah standard issued by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) on repurchase agreements, or ensure that these agreements fulfil Sharī'ah requirements as stipulated by relevant Sharī'ah boards in their jurisdiction should the relevant AAOIFI standard not be implemented there.

[152] Information should be disclosed to the extent it would not risk prejudicing the security and integrity of the FMI or divulging commercially sensitive information, such as trade secrets or other intellectual property.

Participants' understanding of rules, procedures, and risks

343. Participants bear primary responsibility for understanding the rules, procedures, and risks of participating in an FMI as well as the risks they may incur when the FMI has links with other FMIs. An FMI, however, should provide all documentation, training, and information necessary to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI. New participants should receive training before using the system, and existing participants should receive, as needed, additional periodic training. An FMI should disclose to each individual participant stress test scenarios used, individual results of stress tests, and other data to help each participant understand and manage the potential financial risks stemming from participation in the FMI.[153] Other relevant information that should be disclosed to participants, but typically not to the public, includes key highlights of the FMI's business continuity arrangements.[154]

344. An FMI is well placed to observe the performance of its participants and should promptly identify those participants whose behaviour demonstrates a lack of understanding of, or compliance with, applicable rules, procedures, and risks of participation. In such cases, an FMI should take steps to rectify any perceived lack of understanding by the participant and take other remedial action necessary to protect the FMI and its participants. This may include notifying senior management within the participant institution. In cases in which the participant's actions present significant risk or present cause for the participant's suspension, the FMI should notify the appropriate regulatory, supervisory, and oversight authorities.

Fees and other material costs to participants

345. An FMI should publicly disclose its fees at the level of the individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes. In addition, an FMI should disclose information on the system design, as well as technology and communication procedures, that affect the costs of operating the FMI. These disclosures collectively help participants evaluate the total cost of using a particular service, compare these costs to those of alternative arrangements,

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[153] In disclosing stress-test information, FMIs should avoid revealing information regarding the positions of individual participants.

[154] Information on business continuity that can undermine an FMI's safety and soundness, such as the locations of back-up sites, should not be disclosed to the public. However, this information should be disclosed to the relevant authorities.

and select only the services that they wish to use. For example, large-value payment systems typically have higher values and lower volumes than retail payment systems, and,as a result, processing costs can be less important to participants than the costs of providing liquidity to fund payments throughout the day. The FMI's design will influence not only how much liquidity participants need to hold in order to process payments but also opportunity costs of holding such liquidity. An FMI should provide timely notice to participants and the public of any changes to services and fees.

Disclosure framework and other information

346. An FMI should complete regularly, and disclose publicly, responses to the disclosure framework for Islamic financial market infrastructures. The FMI should provide comprehensive and appropriately detailed disclosures to improve the overall transparency of the FMI, its governance, operations, and risk management framework. In order for the disclosures to reflect correctly the FMI's current rules, procedures, and operations, the FMI should update its responses following material changes to the system or its environment. At a minimum, an FMI should review its responses to the disclosure framework every two years to ensure continued accuracy and usefulness.

347. Other relevant information for participants and, more generally, the public could include general information on the FMI's full range of activities and operations, such as the names of direct participants in the FMI, key times and dates in FMI operations, and its overall risk management framework (including its collateral methodology and assumptions).[155] An FMI also should disclose its financial condition, financial resources to withstand potential losses, timeliness of settlements, and other performance statistics. With respect to data, an FMI should, at a minimum, disclose basic data on transaction volumes and values.[156]

[155] A clear description of the typical life cycle of the transaction clearing and settlement process under normal circumstances may also be useful for participants and the public. This information would highlight how the FMI processes a transaction, including the timeline of events, the validation and checks to which a transaction is subjected, and the responsibilities of the parties involved.

[156] TRs should also disclose data consistent with Principle 24.

Forms of disclosure

348. An FMI should make the relevant information and data it discloses as set forth in this report readily available through generally accessible media, such as the Internet, in a language commonly used in financial markets in addition to the domestic language(s) of the jurisdiction in which the FMI is located. The data should be accompanied by robust explanatory documentation that enables users to understand and interpret the data correctly.

PS	CSD	SSS	CCP	TR
				●

Principle 24: Disclosure of market data by trade repositories

A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.

349. This principle should be reviewed in the context of Principle 17 on operational risk and other principles, as appropriate.

Key considerations

1. *A TR should provide data in line with regulatory and industry expectations to relevant authorities and the public, respectively, that is comprehensive and at a level of detail sufficient to enhance market transparency and support other public policy objectives.*

2. *A TR should have effective processes and procedures to provide data to relevant authorities in a timely and appropriate manner to enable them to meet their respective regulatory mandates and legal responsibilities.*

3. *A TR should have robust information systems that provide accurate current and historical data. Data should be provided in a timely manner and in a format that permits it to be easily analysed.*

Questions by key consideration

Key consideration 1:

Q.24.1.1: What data are made available by the TR to the relevant authorities and to the public?

Q.24.1.2: How does the TR ensure that its disclosures of data effectively meet the needs of the relevant authorities and the public?

Key consideration 2:

Q.24.2.1: What processes and procedures does the TR use to provide data to relevant authorities in a timely and appropriate manner to enable them to meet their respective regulatory mandates and legal responsibilities?

Q.24.2.2: How does the TR ensure that this provision of data to relevant authorities is supported from a legal, procedural, operational and technological perspective?

Key consideration 3:

Q.24.3.1: How does the TR ensure that data remain accurate?

Q.24.3.2: How does the TR ensure that data and other relevant information are provided in a format that is generally accessible, comparable and easily analysed?

Explanatory note

350. TRs may play a fundamental role in providing market transparency and are particularly important in the OTC markets. From a public policy perspective, the data maintained and generated by the operations of a TR and on behalf of its participants should promote market transparency and foster public policy objectives, subject to relevant laws governing disclosures of information maintained by a TR. Market transparency supports investor protection as well as the exercise of market discipline. Transparency to the broader public helps build greater confidence in, and understanding of, markets and informs and builds support for sound public policies. Authorities may identify other policy objectives specific to an individual TR's role in supporting market transparency in addition to these core policy objectives.

Disclosure of data

351. A TR should provide data in line with regulatory and industry expectations to relevant authorities and the public, respectively, that is comprehensive and at a level of detailsufficient to enhance market transparency and support other public policy objectives. Accordingly, it is critical that TRs provide effective access to data to relevant authorities and the public. The

scope and level of detail of the data that a TR provides will vary depending on the respective information needs of the relevant authorities, the TR's participants, and the public. At a minimum, a TR should provide aggregate data on open positions and transaction volumes and values and categorised data (e.g. aggregated breakdowns of trading counterparties, reference entities, or currency breakdowns of products), as available and appropriate, to the public. Relevant authorities should have access to additional data recorded in a TR, including participant-level data, that is relevant to their respective regulatory mandates and legal responsibilities, which may include market regulation and surveillance, oversight of market infrastructures, prudential supervision, resolution of failed institutions, and systemic risk regulation.

Processes and procedures

352. A TR should have effective processes and procedures to provide data to relevant authorities in a timely and appropriate manner to enable them to meet their respective regulatory mandates and legal responsibilities. For example, a TR should have procedures to facilitate enhanced monitoring, special actions, or official proceedings taken by relevant authorities in relation to data on troubled or failed participants by making relevant information in the TR available in a timely and effective manner. The provision of data from a TR to relevant authorities should be supported from a legal, procedural, operational, and technological perspective.[157]

Information systems

353. To meet the information needs of participants, authorities, and the public, a TR should have robust information systems that provide accurate current and historical data. A TR should collect, store, and provide data to participants, authorities, and the public in a timely manner and in a format that can facilitate prompt analysis. Data should be made available that permits both comparative and historical analysis of the relevant markets. The criticality of a TR's or its market's role should be a consideration in the frequency and speed with which data and other information are disclosed. If a TR is one of several providing services to a particular market, the TR should provide basic data and other information in a manner that can be easily

[157] Authorities may need to cooperate in order to ensure timely access to trade data (see key consideration 8 of Responsibility E).

analysed and compared to and aggregated with information provided by others serving the market. A TR should consult with relevant authorities in developing and maintaining a reporting framework that facilitates analysis, comparison, and aggregation of data from other TRs.

Forms of disclosure

354. A TR should make the data and other relevant information it discloses as set forth in this report readily available through generally accessible media, such as the Internet, in a language commonly used in financial markets in addition to the domestic language(s) of the jurisdiction in which the TR is located. The data should be accompanied by robust explanatory documentation that enables users to understand and interpret the data correctly.

Sharīʿah governance

PS	CSD	SSS	CCP	TR
●	●	●	●	●

Principle 25: Sharī'ah governance

Where FMIs claim Sharīʿah compliance for all or part of their activities, the FMIs should be equipped with a sound Sharīʿah governance framework to supervise all those activities and the basis on which they are carried on.

355. The CPIFRFMI recognises the importance of having a conducive marketplace for Islamic capital markets that provide end-to-end Sharī'ah-compliant activities throughout securities and settling, payment, and data recording in the FMIs. In light of this, IFSB-21 (*Core Principles for Islamic Finance Regulation [Islamic Capital Market Segment]*) and the IFSB standard on Sharī'ah governance[158] provide guidance on Sharī'ah governance for institutions offering Islamic financial services (IIFS), which is applicable to Islamic FMIs.

Key considerations

1. *An FMI should have adequate and effective access to a Sharī'ah board with relevant skills and expertise to ensure that the relevant activities comply at all times with Sharī'ah rules and principles.*

2. *The governing body (e.g. board of directors) of the FMI that claims Sharīʿah compliance in all or part of its activities should have responsibilities for the establishment and oversight of the effectiveness of the Sharīʿah governance system*.

[158] Currently, IFSB-10 (*Guiding Principles on Sharīʿah Governance Systems for Institutions offering Islamic Financial Services*).

3. *An FMI should ensure that the products and services offered to its participants have undergone a sound screening and approval process by its Sharīʿah board and/or are in conformance with the jurisdiction's centralised Sharīʿah standards (if applicable).*

4. *The Sharīʿah board should play a strong and independent oversight role, with adequate capability to exercise objective judgment on Sharīʿah-related matters. There should be an appropriate and transparent process for resolving any differences of opinion between the board and the Sharīʿah board.*

5. *An FMI should have a properly functioning Sharīʿah governance system, including:*

    a) *clear terms of reference regarding the Sharīʿah board's mandate, reporting line and responsibility;*

    b) *well-defined operating procedures and lines of reporting;*

    c) *good understanding of, and familiarity with, professional ethics and conduct on the part of those involved;*

    d) *procedures for the issuance of relevant Sharīʿah board pronouncements/resolutions and dissemination of information on them to the operative personnel of the FMI who monitor day-to-day compliance with the Sharīʿah pronouncements/resolutions;*

    e) *an internal Sharīʿah compliance review and audit for verifying that Sharīʿah compliance has been achieved;*

    f) *an annual Sharīʿah compliance review and audit for verifying that the internal Sharīʿah compliance review and audit has been appropriately carried out and its findings have been duly noted by the Sharīʿah board; and*

    g) *disclosure of the Sharīʿah governance arrangements to the FMI's participants, relevant authorities, and the general public.*

6. *The Sharīʿah board should be provided with complete, adequate and timely information prior to all meetings and on an ongoing basis on any product or service on which a pronouncement is sought, including having its attention drawn to any areas of possible difficulty identified by the management. The Sharīʿah board should have free access to senior management for all the information it needs.*

7. *An FMI should have procedures in place for seeking an emergency ruling from a Sharīʿah board during unforeseen events (e.g. during a crisis situation).*

Questions by key consideration

Key consideration 1:

Sharīʿah board and oversight

Q.25.1.1: Does the FMI have adequate and effective access to a Sharīʿah board? If yes, how does the FMI assess the board's competence?

Q.25.1.2: Does the governing body (e.g. board of directors) of the FMI that claims Sharīʿah compliance in all or part of its operations have responsibilities for the establishment, and oversight of the effectiveness, of the Sharīʿah governance system?

Key consideration 2:

Screening and approval processes

Q.25.2.1: Does the FMI ensure that the products and services offered to its participants have undergone a sound screening and approval process by its Sharīʿah board and/or are in conformance with the jurisdiction's centralised Sharīʿah standards (if applicable)?

Key consideration 3:

Roles and responsibilities

Q.25.3.1: What are the lines of responsibility and accountability of the Sharīʿah board within the FMI? How and where are these arrangements documented?

Q.25.3.2: What are the roles and responsibilities of the Sharīʿah board (or equivalent), and are they clearly specified?

Q.25.3.3: What are the Sharīʿah board's procedures for its functioning, including procedures to identify, address and manage members' conflicts of interest? How are these procedures documented?

Key consideration 4:

Sharīʿah governance arrangements

Q.25.4.1: What are the procedures and approval processes to endorse a particular product and/or service offered to FMI's participants as Sharīʿah-compliant?

Q.25.4.2: How are the procedures and approval processes for a particular product and/or service documented?

Q.25.4.3: Does the FMI have an internal compliance function, including adequate procedures for the dissemination of relevant Sharīʿah board pronouncements/resolutions to its operative personnel who monitor day-to-day compliance with the Sharīʿah pronouncements/resolutions?

Q.25.4.4: Does the FMI conduct an internal Sharīʿah compliance review and audit with sufficient periodicity to verify that Sharīʿah compliance has been satisfied, during which any incident of non-compliance will be recorded and reported, and, as far as possible, addressed and rectified?

Q.25.4.5: Does the FMI carry out an annual external Sharīʿah compliance review and audit to verify that the internal Sharīʿah compliance review and audit has been appropriately carried out and its findings have been duly noted by the Sharīʿah board?

Q.25.4.6: Has the FMI established a set of procedures (corrective action plans) should a non-Sharīʿah-compliant activity be detected?

Key consideration 5:

Disclosure of Sharīʿah governance arrangements

Q.25.5.1: How are the Sharīʿah governance arrangements disclosed to the FMI's participants, relevant regulators, and the public?

Cooperation arrangement

Q.25.5.2: How does the FMI manage cross-border activities where Sharīʿah interpretation differs from one jurisdiction to another where it operates or has established a link?

Key consideration 6:

Emergency ruling

Q.25.6.1: What are the procedures and arrangements in place should an emergency ruling/*fatwā* be required from a Sharīʻah board?

Explanatory note

356. This additional principle is closely related to points covered in many other principles, including, for instance: legal risk that may arise from different Sharīʻah interpretations (Principle 1 on legal basis); relationship between the board and the Sharīʻah board (Principle 2 on governance); specificities of Islamic finance on settlement guarantee (default) fund and late payment fees (Principle 4 on credit risk); collateral management (Principle 5 on collateral); specificities of Islamic finance on collateral system (Principle 6 on calculation of collateral); liquidity facility and placement of cash (Principle 7 on liquidity risk); settlement arrangement (Principle 9 on money settlements); omnibus account arrangement for FMIs (Principle 14 on segregation and portability); investment policy (Principle 16 on custody and investment risk); FMI's link management (Principle 20 on FMI links); and disclosures for FMI's activities (Principle 23 on disclosure of rules, key procedures and market data).

357. Sharīʻah defines a set of rules and principles governing the overall Islamic financial system. Compliance with these rules and principles is the most important factor differentiating Islamic products and services from conventional ones. Hence, a peculiar feature of FMIs that offer Islamic products and services is the requirement to comply with Sharīʻah rules and principles, and this requires the services of a competent Sharīʻah board (comprising, in line with IFSB-10: *Guiding Principles on Sharīʻah Governance Systems for IIFS*, three or more Sharīʻah scholars, a Sharīʻah advisory firm or an individual scholar).

358. "Sharīʻah governance system"[159] refers to the set of institutional and organisational arrangements that is required to ensure there is effective and independent oversight of

[159] IFSB–10: *Guiding Principles on Sharīʻah Governance Systems for IIFS* covers the relationship between Sharīʻah governance in individual institutions and whatever Sharīʻah governance arrangements may exist for a jurisdiction as a whole. It recognises that Sharīʻah governance may take several forms, and that jurisdictions have adopted diverse approaches to it. The standard has been prepared within that context and accommodates

Sharī‘ah compliance through a number of structures and processes, including those set out in the key considerations.

359. The Sharīʿah governance structure adopted by an FMI should be proportionate with regard to the size, complexity and nature of its business. For example, the Sharīʿah board of a large FMI could include several scholars, while a small operation might rely upon one appropriately qualified scholar and integrate its Sharīʿah compliance testing and audit with its compliance and internal audit frameworks.

360. An FMI should establish or adopt appropriate "fit and proper" criteria for the members of its Sharī‘ah board. It should ensure its Sharī‘ah board has suitable qualifications, training, skills, practical experience and commitment [160] to effectively discharge its role and responsibilities.

361. Members of the Sharī‘ah board may be required to follow certain behavioural standards, particularly in regard to the protection of confidential information, as well as other measures such as abiding by, where available and at the discretion of the regulator, specific codes of conduct, governance standards, and restrictions in place on the number and types of Sharī‘ah boards they may sit on concurrently.

362. Where any Sharīʿah non-compliance is identified, either in day-to-day operations or during a Sharīʿah compliance review, it should be recorded, reported and, to the extent possible,[161] addressed and rectified; or, where it cannot be rectified, the consequences of invalidation should be imposed.

363. An FMI's products and services are required to be Sharī‘ah-compliant on an ongoing basis and at all stages. An FMI should ensure its Sharī‘ah governance arrangements are well documented and made available to the relevant stakeholders. Disclosures might normally

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whatever Sharī‘ah governance arrangements consistent with IFSB-10 that may apply in an institution or jurisdiction. http://www.ifsb.org/standard/IFSB-10%20Shariah%20 Governance.pdf

[160] Where a Sharī‘ah board provides services for more than one institution simultaneously, it should ensure that it is able to demonstrate commitment by having adequate time and resources to effectively fulfil its role and responsibility.

[161] The assertion "to the extent possible" recognises, for example, instances when an underlying security has moved away from being Sharī‘ah-compliant and the transition to non-compliance is irreversible – for instance, due to invalidation of the contracts used to structure the security, or when the issuer of the security no longer wishes to claim Shari'ah compliance. Another example would be mistakenly accepting non-compliant collateral, where the mistake is discovered only after the collateral has been returned to the participant.

include: (a) a procedure and approval process to endorse a particular product or service offered to the FMI's participants as Sharī'ah-compliant; (b) a corrective action plan that may be deployed following detection of a Sharī'ah non-compliant activity; (c) a statement on the FMI's board's responsibility for Sharīʿah compliance and its relationship to the Sharī'ah board; (d) a statement on the independence of the Sharī'ah board; (e) qualifications and areas of expertise of the Sharī'ah board; (f) appointment and change of members of the Sharī'ah board during the financial year; and (g) the Sharī'ah board's opinion on the FMI's state of compliance with Sharī'ah rules and principles.

364. An FMI should have in place a formal periodic assessment of the effectiveness of a Sharīʿah board as a whole and of the contribution by each member (where applicable) to the effectiveness of the Sharīʿah board. The criteria for such assessment should be established by the FMI's board in consultation with the Sharīʿah board. The performance assessment report should be submitted to the FMI's board.

Responsibilities of Authorities for FMIs

Responsibility A: Regulation, supervision, and oversight of FMIs

FMIs should be subject to appropriate and effective regulation, supervision, and oversight by a central bank, market regulator, or other relevant authority.

Key considerations

1. *Authorities should clearly define and publicly disclose the criteria used to identify FMIs that should be subject to regulation, supervision, and oversight.*

2. *FMIs that have been identified using these criteria should be regulated, supervised, and overseen by a central bank, market regulator, or other relevant authority.*

Questions by key consideration

Key consideration 1:

Q.A.1.1: What criteria do authorities use to identify FMIs that should be regulated, supervised and overseen?

Q.A.1.2: How are the criteria publicly disclosed?

Key consideration 2:

Q.A.2.1: Which FMIs have been identified for regulation, supervision and oversight? Did the authorities use the criteria set forth in key consideration 1?

Q.A.2.2: Which authority or authorities regulate, supervise or oversee the identified FMIs? What is the scope of the responsibilities for each authority?

Q.A.2.3: How have relevant authorities avoided (or addressed) any gaps in regulation, supervision or oversight of FMIs?

Explanatory note

365. FMIs are critical components of domestic and international financial markets and help to maintain and promote financial stability in periods of market stress. FMIs provide a number of services that are vital to a well-functioning financial system, including facilitating the exchange of money for goods, services, and financial assets and providing a safe and efficient means through which authorities can manage systemic risk and central banks can implement monetary policy. By design, FMIs concentrate payment, clearing, and settlement activities and trade data in order to manage risk better and to reduce payment, clearing, settlement, and recording costs and delays. Well-functioning FMIs can vastly improve the efficiency, transparency, and safety of financial systems. However, FMIs often concentrate risk and may even act as a source of systemic risk. Therefore, appropriate regulation, supervision, and oversight is critical to achieving the public policy goals set out in this report.

Criteria for regulation, supervision, and oversight

366. Authorities should clearly define and publicly disclose the criteria used to identify FMIs that should be subject to regulation, supervision, and oversight. The precise framework for making such decisions may vary across jurisdictions. In some countries, for example, there is a statutory framework, while in others, the central bank or other relevant authorities have greater discretion to set the criteria used. A basic criterion, however, is the function of the FMI. Systemically important payment systems, CSDs, SSSs, CCPs, and TRs are typically subject to regulation, supervision, and oversight because of the critical role that they play in the financial system. Criteria that are often considered in determining the need for or degree of regulation, supervision, and oversight for various types of FMIs include (a) the number and value of transactions processed, (b) the number and type of participants, (c) the markets served, (d) the market share controlled, (e) the interconnectedness with otherFMIs and other financial institutions, and (f) the available alternatives to using the FMI at short notice. Authorities may also want to designate FMIs as systemically important on the basis of other criteria relevant in their jurisdictions for the purposes of applying the CPSS-IOSCO *Principles for financial market infrastructures*.

Responsibilities for regulation, supervision, and oversight

367. FMIs that have been identified using these criteria should be regulated, supervised, and overseen by a central bank, market regulator, or other relevant authority.The division of powers or responsibilities among authorities for regulating, supervising, and overseeing FMIs may vary depending on the applicable legal and institutional framework and the sources

of such powers or responsibilities may take different forms. Preferably, legislation will clearly specify which authority or authorities have responsibility. For example, one or more authorities may have regulatory, supervisory, or oversight responsibility for an FMI registered, chartered, licensed, or designated as an entity that falls within a specific legislative mandate. However, in the national context, an FMI also may be overseen by an authority that does not derive responsibility from a specific legislative mandate.[162] Relevant authorities should address any existing gaps in regulation, supervision, and oversight of FMIs (see Responsibility E, which addresses cooperation among different authorities, particularly in the international setting).

[162] This includes traditional use of moral suasion by central banks.

Responsibility B: Regulatory, supervisory and oversight powers and resources

Central banks, market regulators, and other relevant authorities should have the powers and resources to carry out effectively their responsibilities in regulating, supervising, and overseeing FMIs.

Key considerations

1. *Authorities should have powers or other authority consistent with their relevant responsibilities, including the ability to obtain timely information and to induce change or enforce corrective action.*

2. *Authorities should have sufficient resources to fulfil their regulatory, supervisory, and oversight responsibilities.*

Questions by key consideration

Key consideration 1:

Powers or other authority consistent with relevant responsibilities

Q.B.1.1: What are the authorities' powers or other authority and how are these consistent with the relevant responsibilities (as identified in Q.A.2.2)?

Powers to obtain timely information

Q.B.1.2: How do the authorities' powers or other authority enable them to obtain timely information from the FMIs, including confidential and non-public information, in order to carry out their responsibilities? What are the relevant constraints, if any?

Q.B.1.3: What information are FMIs required to provide? How frequently does the FMI provide this information?

Q.B.1.4: To what extent do authorities have the ability to obtain information to understand and assess: (a) an FMI's various functions, activities and overall financial condition; (b) the risks borne or created by an FMI

and, where appropriate, the participants; (c) an FMI's impact on its participants and the broader economy; and (d) an FMI's adherence to relevant regulations and policies?

Powers to induce change or enforce corrective action

Q.B.1.5: What powers, authority or other mechanisms enable authorities to induce change or enforce corrective action in an FMI that is not observing relevant principles or that is not complying with relevant regulations or policies? What are the relevant constraints, if any?

Key consideration 2:

Resources

Q.B.2.1: What resources (including adequate funding, qualified and experienced personnel, and appropriate ongoing training) are available to authorities to enable them to fulfil their responsibilities?

Q.B.2.2: To what extent does the level of available resources constrain the ability of the authorities to carry out their responsibilities?

Q.B.2.3: What is each authority's process for assessing the resources it needs to fulfil its regulatory, supervisory or oversight responsibilities?

Legal protections

Q.B.2.4: Where relevant, what legal protections apply to the staff that carries out responsibilities for regulation, supervision and oversight?

Explanatory note

368. While the primary responsibility for ensuring an FMI's safety and efficiency lies with the system's owners and operator, central banks, market regulators, and other relevant authorities generally share the common objective of ensuring the safety and efficiency of FMIs. However, regulation, supervision, and oversight of an FMI are needed to ensure that the FMI fulfils this responsibility, to address negative externalities that can be associated with the FMI, and to foster financial stability

generally. Further, authorities should have theappropriate powers and resources in order to administer their regulatory, supervisory, and oversight responsibilities effectively. An authority's powers, which may be statutory or non-statutory, should be consistent with its relevant responsibilities.

Powers to obtain information

369. Authorities should have powers or other authority consistent with their relevant responsibilities to obtain timely information necessary for effective regulation, supervision, and oversight. In particular, authorities should use these powers to access information that enables them to understand and assess: (a) an FMI's various functions, activities, and overall financial condition; (b) the risks borne or created by an FMI and, where appropriate, its participants; (c) an FMI's impact on its participants and the broader economy; and (d) an FMI's adherence to relevant regulations and policies. Key sources of information include official system documents and records, regular or ad-hoc reports, internal reports from board meetings and internal auditors, on-site visits and inspections, information on operations outsourced to third parties, and dialogue with an FMI's board, management, or participants.[163] Authorities should have appropriate legal safeguards to protect all confidential and non-public information obtained from an FMI. Authorities, however, should be able to share relevant confidential or non-public information with other authorities, as appropriate, to minimise gaps and reduce duplication in regulation, supervision, and oversight.

Powers to induce change or enforce corrective action

370. Authorities also should have powers or other authority consistent with their relevant responsibilities to induce change or enforce corrective action in an FMI that is not complying with relevant regulations or policies. Other mechanisms may also be used to effect change, including the use of moral suasion. Discussions with FMIs, their participants, and, in some cases, their participants' customers play an important part in achieving regulatory, supervisory, and oversight objectives. In many cases,

[163] Official system documentation includes the FMI's rules, procedures, and business continuity plans. Regular or ad hoc reporting includes daily volume and value of transactions reports, operating performance reports, stress test results, and the scenarios and methodology employed in estimating exposures.

an authority may be able to rely on moral suasion to promote public policy interests for FMIs and their stakeholders. These techniques, however, work best when there are credible regulatory or other remedies available to authorities. Where appropriate and legally permissible, authorities may want to consider publicly disclosing their assessments of certain FMIs as a means to induce change at those FMIs and promote transparency.

Sufficient resources

371. Authorities should have sufficient resources to fulfil their regulatory, supervisory, and oversight responsibilities. Sufficient resources include adequate funding, qualified and experienced personnel,[164] and appropriate ongoing training. In addition, authorities should adopt an organisational structure that uses these resources effectively. It should be clear where the responsibility for regulatory, supervisory, and oversight functions lies within an authority or authorities. These functions may include gathering information on FMIs, assessing the operation and design of FMIs, assessing interdependencies among FMIs, taking action to promote FMIs' observance of relevant policies and standards, and conducting on-site visits or inspections when necessary. Where relevant, personnel should have the appropriate legal protections to carry out their responsibilities.

372. Recent rapid developments in information technology have thrown up a number of new technologies which may impact on FMIs. Some of these may offer possibilities for improved efficiency and effectiveness and may, depending on the regulatory regime, allow for new entrants to the markets. Others may pose threats – for example, to cybersecurity. Authorities should ensure that they have sufficient technical capacity of their own to understand these opportunities and threats and to exercise their regulatory, supervisory and oversight responsibilities effectively.

[164] This includes sufficient knowledge of Islamic finance for the authorities to undertake their supervisory function accordingly.

Responsibility C: Disclosure of policies with respect to FMIs

Central banks, market regulators, and other relevant authorities should clearly define and disclose their regulatory, supervisory, and oversight policies with respect to FMIs.

Key considerations

1. *Authorities should clearly define their policies with respect to FMIs, which include the authorities' objectives, roles, and regulations.*

2. *Authorities should publicly disclose their relevant policies with respect to the regulation, supervision, and oversight of FMIs.*

Questions by key consideration

Key consideration 1:

Q.C.1.1: What are each authority's policies with respect to FMIs, including its objectives, roles and regulations? Are they clearly defined?

Key consideration 2:

Q.C.2.1: How are the relevant policies disclosed?

Explanatory note

373. Central banks, market regulators, and other relevant authorities should clearly define their regulatory, supervisory, and oversight policies with respect to FMIs, which include the authorities' objectives, roles, and regulations. A clear definition of authorities' objectives provides a basis for consistent policymaking and a benchmark by which authorities can evaluate their effectiveness. Typically, the primary objectives of authorities with respect to FMIs are to promote safety and efficiency. Some authorities may also have additional relevant public policy objectives for the FMIs they

regulate, supervise, or oversee. These objectives are usually implemented through specific regulations and other policies, such as risk management standards or expectations for FMIs. The policies of authorities should be consistent with their legislative framework. In addition, authorities may find it beneficial to consult with the market, key stakeholders, and the broader public regarding their policies. In many countries, these consultations may be required by law.

374. Authorities should publicly disclose their relevant policies with respect to the regulation, supervision, and oversight of FMIs, as public disclosure promotes consistent policies. Such disclosure typically involves communicating the authorities' regulatory, supervisory, and oversight standards for FMIs and helps to establish clear expectations and facilitate compliance with those standards. Furthermore, disclosing policies publiclycommunicates the responsibilities and expectations of authorities to the wider public and thereby promotes the accountability of those authorities. Authorities can publicly disclose their policies in a variety of forms, including plain-language documents, policy statements, and relevant supporting material. Such materials should be readily available.[165] These disclosures, however, do not shift the responsibility of ensuring the safe and efficient operation of FMIs from the FMI to authorities. Authorities should emphasise that primary responsibility for complying with the regulatory, supervisory, and oversight policies rests with the FMIs themselves.

375. More specifically, authorities responsible for FMIs should make appropriate, clear and accessible disclosures about their role and that of any central Sharī'ah authority in relation to Sharī'ah governance within the FMIs.

[165] For example, an authority can publicly disclose its policies by posting them to a public website.

Responsibility D: Application of the principles for FMIs

Central banks, market regulators, and other relevant authorities should adopt the IFSB CPIFRFMI and apply them consistently.

Key considerations

1. *Authorities should adopt the IFSB CPIFRFMI.*
2. *Authorities should ensure that these principles are, at a minimum, applied to all systemically important payment systems, CSDs, SSSs, CCPs, and TRs.*
3. *Authorities should apply these principles consistently within and across jurisdictions, including across borders, and to each type of FMI covered by the principles.*

Questions by key consideration

Key consideration 1:

Q.D.1.1: How and to what extent have the relevant authorities adopted the principles?

Key consideration 2:

Q.D.2.1: To which systemically important payment systems, CSDs, SSSs, CCPs and TRs do authorities apply the principles? Are there systemically important FMIs to which the relevant authorities do not apply the principles?

Q.D.2.2: How do the authorities disclose to which FMIs they apply or do not apply the principles? How does each relevant authority justify its decision to apply or not to apply the principles to specific FMIs?

Key consideration 3:

Q.D.3.1: How do authorities apply these principles consistently within the relevant jurisdictions, including to public sector-owned or -operated FMIs, and across jurisdictions, including across borders?

Q.D.3.2: If an authority is an owner and operator of FMIs as well as the overseer of private sector FMIs, how does it consider and address possible conflicts of interest?

Q.D.3.3: If an FMI does not observe all applicable principles, how do authorities ensure that the FMI takes appropriate and timely action to remedy its deficiencies?

Explanatory note

376. Central banks, market regulators, and other relevant authorities should adopt the IFSB CPIFRFMI. The adoption and application of these principles can greatly enhance regulatory, supervisory, and oversight efforts by relevant authorities and support the establishment of important minimum standards for risk management. While the precise means through which the principles are applied will vary from jurisdiction to jurisdiction, authorities should apply the principles to the relevant FMIs in their jurisdiction to the fullest extent allowed by the jurisdiction's legal framework.[166] The principles draw on the collective experience of many central banks, market regulators, and other relevant authorities and have been subject to public consultation. The use of these principles helps to ensure that FMIs are safe, efficient and Sharī'ah-compliant.

Scope of application of principles

377. Authorities should ensure that the CPIFRFMI are, at a minimum, applied to all systemically important payment systems, CSDs, SSSs, CCPs, and TRs. A

[166] In some cases, specific legislation may be used or needed to set out the precise regulatory framework and rules applicable to FMIs. In other cases, the relevant authorities may not need statutory authority to adopt them, though they may still need to create more detailed policies, rules, or regulations to implement them.

payment system is systemically important if it has the potential to trigger or transmit systemic disruptions; this includes, among other things, systems that are the sole payment system in a country or the principal system in terms of the aggregate value of payments, and systems that mainly handle time-critical, high-value payments or settle payments used to effect settlement inother FMIs. The presumption is that all CSDs, SSSs, CCPs, and TRs are systemically important because of their critical roles in the markets they serve.[167] Authorities should disclose which FMIs they do not regard as systemically important and to which they do not intend to apply the principles and provide a comprehensive and clear rationale. Conversely, authorities may disclose which FMIs they regard as systemically important.[168]

Consistent application of principles

378. Authorities should apply the principles consistently within and across jurisdictions, including across borders, and to each type of FMI covered by these principles. Consistent application of these principles is important because different systems may be dependent on each other, in direct competition with each other, or both. The principles also represent common interests which make it easier for different authorities to work cooperatively and enhance the effectiveness and consistency of regulation, supervision, and oversight. This is particularly important because many FMIs operate across multiple jurisdictions. Authorities may apply more demanding requirements if and when they deem it appropriate to do so.

Observance of internationally accepted principles

379. If a systemically important FMI does not observe the applicable principles, relevant authorities should ensure, as far as possible within their responsibilities and powers, that the FMI takes appropriate and timely action to remedy its deficiencies within a time frame consistent with the type or impact of the risks, concerns, or other issues associated with the identified gaps and shortcomings. Authorities should closely

[167] In some jurisdictions, national law will dictate the criteria to determine whether an FMI is systemically important.

[168] See also key consideration 1 of Responsibility A, which requires authorities to clearly define and publicly disclose the criteria used to identify FMIs that should be subject to regulation, supervision, and oversight.

monitor newly formed FMIs and those undergoing significant changes.[169] Where central banks themselves own or operate FMIs or key components of FMIs, they should apply, to the extent applicable, the same international standards to their own systems with the same rigor as other overseen systems. If a central bank is an owner or operator of an FMI as well as the overseer of private-sector FMIs, it needs to consider how best to address any possible conflicts of interest. In particular, it should avoid disadvantaging private-sector FMIs relative to those it owns and operates.

[169] In these instances, authorities should engage with the FMI at an early stage to foster public policy goals and identify opportunities to enhance safety and efficiency.

Responsibility E: Cooperation with other authorities

Central banks, market regulators, and other relevant authorities should cooperate with each other, both domestically and internationally, as appropriate, in promoting the safety and efficiency of FMIs.

Key considerations

1. *Relevant authorities should cooperate with each other, both domestically and internationally, to foster efficient and effective communication and consultation in order to support each other in fulfilling their respective mandates with respect to FMIs. Such cooperation needs to be effective in normal circumstances and should be adequately flexible to facilitate effective communication, consultation, or coordination, as appropriate, during periods of market stress, crisis situations, and the potential recovery, wind-down, or resolution of an FMI.*

2. *If an authority has identified an actual or proposed operation of a cross-border or multicurrency FMI in its jurisdiction, the authority should, as soon as it is practicable, inform other relevant authorities that may have an interest in the FMI's observance of the IFSB CPIFRFMI.*

3. *Cooperation may take a variety of forms. The form, degree of formalisation and intensity of cooperation should promote the efficiency and effectiveness of the cooperation and should be appropriate to the nature and scope of each authority's responsibility for the supervision or oversight of the FMI and commensurate with the FMI's systemic importance in the cooperating authorities' various jurisdictions. Cooperative arrangements should be managed to ensure the efficiency and effectiveness of the cooperation with respect to the number of authorities participating in such arrangements.*

4. *For an FMI where cooperative arrangements are appropriate, at least one authority should accept responsibility for establishing efficient and effective cooperation among all relevant authorities. In international cooperative arrangements where no other authority accepts this responsibility, the presumption is the authority or authorities with primary responsibility in the FMI's home jurisdiction should accept this responsibility.*

5. *At least one authority should ensure that the FMI is periodically assessed against the principles and should, in developing these assessments, consult with other authorities that conduct the supervision or oversight of the FMI and for which the FMI is systemically important.*

6. *When assessing an FMI's payment and settlement arrangements and its related liquidity risk management procedures in any currency for which the FMI's settlements are systemically important against the principles, the authority or authorities with primary responsibility with respect to the FMI should consider the views of the central banks of issue. If a central bank of issue is required under its responsibilities to conduct its own assessment of these arrangements and procedures, the central bank should consider the views of the authority or authorities with primary responsibility with respect to the FMI.*

7. *Relevant authorities should provide advance notification, where practicable and otherwise as soon as possible thereafter, regarding pending material regulatory changes and adverse events with respect to the FMI that may significantly affect another authority's regulatory, supervisory, or oversight interests.*

8. *Relevant authorities should coordinate to ensure timely access to trade data recorded in a TR.*

9. *Each authority maintains its discretion to discourage the use of an FMI or the provision of services to such an FMI if, in the authority's judgment, the FMI is not prudently designed or managed or the principles are not adequately observed. An authority exercising such discretion should provide a clear rationale for the action taken both to the FMI and to the authority or authorities with primary responsibility for the supervision or oversight of the FMI.*

10. *Cooperative arrangements between authorities in no way prejudice the statutory or legal or other powers of each participating authority, nor do these arrangements constrain in any way an authority's powers to fulfil its statutory or legislative mandate or its discretion to act in accordance with those powers.*

11. *Relevant authorities should promote Sharī'ah harmonisation with those jurisdictions with which their FMIs have cooperation arrangements. Where*

this is not achievable, they should understand the differences in interpretation that may be important to assessing the risks posed to FMIs.

Questions by key consideration

Key consideration 1:

Q.E.1.1: For which FMIs is there cooperation among authorities and what authorities are involved?

Q.E.1.2: How does the cooperation among authorities, both domestically and internationally, foster efficient and effective communication and consultation in order to support each other in fulfilling their respective mandates with respect to FMIs in normal circumstances?

Q.E.1.3: How does the cooperation among authorities facilitate the effective communication, consultation or coordination, as appropriate, during periods of market stress, crisis situations and the potential recovery, wind-down or resolution of an FMI?

Key consideration 2:

Q.E.2.1: Which FMIs in the authorities' jurisdiction provide cross-border or multicurrency services? How do authorities identify an actual or proposed operation of a cross-border or multicurrency FMI in their jurisdiction?

Q.E.2.2: What criteria do authorities use to determine whether other relevant authorities should be notified?

Q.E.2.3: How and when are notifications provided to other relevant authorities?

Key consideration 3:

Forms of cooperation

Q.E.3.1: What are the forms of cooperation for each FMI identified under key consideration 1?

Q.E.3.2: How are the forms of cooperation appropriate to the nature and scope of each authority's responsibility for the supervision or oversight of the FMI?

Efficiency and effectiveness of cooperation

Q.E.3.3: How does the management of cooperative arrangements promote the efficiency and effectiveness of the cooperation, including with respect to the number of authorities participating in such arrangements?

Key consideration 4:

Q.E.4.1: For each FMI identified under key consideration 1 where cooperative arrangements are appropriate, which authority or authorities have accepted responsibility for establishing efficient and effective cooperation among all relevant authorities?

Q.E.4.2: What are the duties of this authority or these authorities with respect to the cooperation?

Key consideration 5:

Q.E.5.1: Which relevant authority ensures that the FMI is periodically assessed against the principles?

Q.E.5.2: How does this authority consult on and share assessments with other relevant authorities that conduct the supervision or oversight of the FMI and for which the FMI is systemically important?

Key consideration 6:

Q.E.6.1: For which currency (or currencies) do the authority or authorities with primary regulation, supervision or oversight responsibility assess the FMI's payment and settlement arrangements and its related liquidity risk management procedures?

Q.E.6.2: When assessing an FMI's payment and settlement systems and its related liquidity risk management procedures in any currency for which the FMI's settlements are systemically important, how do the authority or authorities with primary regulation, supervision or oversight responsibility with respect to the FMI consider the views of the central bank(s) of issue?

Q.E.6.3: When conducting its own assessment of the payment and settlement arrangements and liquidity risk management procedures of an FMI, how does the central bank of issue consider the views of the authority or authorities with primary responsibility with respect to the FMI?

Key consideration 7:

Q.E.7.1: How do relevant authorities provide advance notification, where practicable and otherwise as soon as possible thereafter, regarding pending material regulatory changes and adverse events with respect to an FMI that may significantly affect the respective regulatory, supervisory or oversight interests of another domestic or foreign authority?

Q.E.7.2: Where appropriate, how does the authority consider the views of such authorities in connection with such regulatory actions taken with respect to the FMI?

Key consideration 8:

Q.E.8.1: If the authority regulates, supervises or oversees a TR that maintains data pertaining to other jurisdictions, how does such an authority

coordinate with other authorities who have a material interest in the trade data consistent with their responsibilities, to ensure that they have timely and appropriate access to trade data in the TR?

Key consideration 9:

Q.E.9.1: Has the authority exercised discretion to discourage the use of an FMI, or the provision of services to an FMI, on the grounds that it is not prudently designed or managed, or the principles are not adequately observed?

Q.E.9.2: If so, did the authority provide a clear rationale to the FMI and to the authority or authorities with primary responsibility for the supervision or oversight of the FMI?

Key consideration 10:

There are no questions with respect to this key consideration.

Key consideration 11:

Q.E.11.1: Where relevant, how does the relevant authority manage the impacts on cross-border activities of different Sharī'ah interpretations?

Explanatory note

380. Central banks, market regulators, and other relevant authorities should cooperate with each other, domestically and internationally (i.e. on a cross-border basis), in order to support each other in fulfilling their respective regulatory, supervisory, or oversight mandates with respect to FMIs. Relevant authorities should explore and, where appropriate, develop cooperative arrangements that take into consideration (a) their statutory responsibilities, (b) the systemic importance of the FMI to their respective jurisdictions, (c) the FMI's comprehensive risk profile (including

consideration of risks that may arise from interdependent entities), (d) the FMI's participants, and (e) different Sharīʿah interpretations (if any). The objective of such arrangements is to facilitate comprehensive regulation, supervision and oversight, and to provide a mechanism whereby the responsibilities of multiple authorities can be fulfilled efficiently and effectively. Authorities are encouraged to cooperate with each other to reduce the probability of gaps in regulation, supervision, and oversight that could arise if they did not coordinate and to minimise the potential duplication of effort and the burden on the FMIs or the cooperating authorities. Relevant authorities should also cooperate with resolution authorities and the supervisors of direct participants, as appropriate and necessary, to enable each to fulfil its respective responsibilities.

381. Different interpretations of Sharīʿah have always posed a hindrance to cross-border activities within the ICM. The extent to which RSAs can promote harmonisation will depend on their responsibilities for Sharīʿah matters. However, even where harmonisation cannot be achieved, understanding of relevant differences may be important in assessing the risks posed to FMIs in cross-border operations.

382. Cooperative arrangements need to foster efficient and effective communication and consultation among relevant authorities. Such arrangements need to be effective in normal circumstances and should be adequately flexible to facilitate effective communication, consultation, or coordination, as appropriate, during periods of market stress, crisis situations, and the potential recovery, wind-down, or resolution of an FMI. Inadequate cooperation, especially during times of market stress and crisis situations, can impede significantly the work of relevant authorities.

Identification of FMIs and relevant authorities

383. If an authority has identified an actual or proposed operation of a cross-border or multicurrency FMI in its jurisdiction, the authority should, as soon as it is practicable, inform other relevant authorities that may have an interest in the FMI's observance of the IFSB CPIFRFMI. To determine whether such notification is appropriate, the authority should consider (to the extent it has such information) the nature and scope of other relevant authorities' regulatory, supervisory, or oversight responsibilities with respect to the FMI and the FMI's systemic importance in those authorities' jurisdictions.

Cooperation arrangements

384. Cooperation may take a variety of forms, including formal arrangements that are organised under memoranda of understanding, protocols, or other documentation

as well as informal ad hoc arrangements and regular communications.[170] The relevant authorities should agree on the form of cooperative arrangement or such multiple arrangements as they deem most appropriate in light of the FMI's specific circumstances. Flexibility as to the form of cooperation allows relevant authorities to continue to adapt to a dynamic environment as financial markets and systems evolve. All authorities involved in cooperative arrangements should have the powers and resources needed to carry out their responsibilities under the arrangements.

385. The appropriate degree of formalisation and the intensity of the cooperation in relation to any given FMI will depend on the relevant authorities' statutory responsibilities and may also depend on the FMI's systemic importance to their respective jurisdictions. The degree of formalisation may vary depending on each set of circumstances. For example, using an ad hoc arrangement to address promptly an emerging supervisory issue may be preferable to establishing a more-formal arrangement. Similarly, the intensity of cooperation may vary among arrangements, ranging from information sharing to more-extensive consultation and cooperation arrangements.[171] Information sharing may include the exchange of supervisory and oversight information (both public and non-public); the exchange of perspectives on risk management controls, safety, and soundness; or plans for the potential recovery, wind-down, or resolution of the FMI.[172] Relevant authorities should seek to achieve a cooperative arrangement that employs an appropriate combination of form and scope to achieve an effective outcome. Cooperative arrangements should be managed to ensure the efficiency and effectiveness of the cooperation with respect to the number of authorities participating in such cooperative arrangements.

386. For an FMI where cooperative arrangements are appropriate, at least one authority should accept responsibility for establishing efficient and effective cooperation arrangements among all relevant authorities. In international cooperative arrangements where no other authority accepts this responsibility, the presumption is

[170] Such arrangements can be either bilateral or multilateral and may be implemented through colleges, regulatory networks, oversight committees, or other cooperative arrangements (e.g. statements of intent or official exchanges of letters) or through ad hoc communication.

[171] These arrangements may define the roles and responsibilities of the relevant authorities in specific (e.g. crisis) scenarios.

[172] In the resolution context, relevant authorities also may exchange information regarding the resolvability of a particular FMI.

the authority or authorities withprimary responsibility in the FMI's home jurisdiction should accept this responsibility. Cooperation with other authorities should be guided by relevant international principles on cooperative arrangements for the regulation, supervision, and oversight of FMIs. This responsibility addresses cooperation among authorities in the application of the principles and is intended to complement, but does not replace or supersede, any other relevant guiding documents.

387. The acceptance of responsibility for establishing the cooperation arrangement for an FMI does not in itself confer any rights, supersede any national laws, or prejudice any bilateral or multilateral information sharing arrangements. The duties of an authority with such responsibility would typically include: (a) proactively proposing arrangements for cooperation that would best meet the relevant authorities' objectives; (b) facilitating coordination and cooperation among the authorities; (c) ensuring transparency in the arrangements; (d) acting, where relevant, as a central point for the information exchanged between the FMI and the relevant authorities; and (e) undertaking or coordinating periodic assessments of the FMI against the principles in consultation with other authorities that have responsibilities with respect to the FMI.

388. Where several authorities have responsibilities in relation to the same FMI, at least one authority should accept responsibility for ensuring that the FMI is periodically assessed against the principles. Authorities should consult with each other, where practicable, and share assessments to support authorities with primary responsibility for the FMI's supervision or oversight and for which the FMI is systemically important. Information sharing and open discussion with respect to the principles should help authorities avoid sending the FMI conflicting messages or imposing unnecessarily burdensome requirements on the FMI. Assessments and the related consultation and information sharing should be conducted without prejudice to the relevant authorities' statutory powers or legal frameworks.

Payment and settlement arrangements

389. An FMI's payment and settlement arrangements and its related liquidity risk-management procedures in any currency for which the FMI's settlements are systemically important should be assessed against the principles by the authority or authorities with primary regulation, supervision, or oversight responsibility with respect to the FMI. When conducting these reviews, the authority or authorities should consider the views of the central banks of issue. Central banks of issue may have an interest in an FMI's payment and settlement arrangements and its related liquidity risk

management procedures because of their roles in implementing monetary policy and maintaining financial stability. Further, if a central bank of issue is required under its responsibilities to conduct its own assessment of these arrangements and procedures, the central bank should consider the views of the authority or authorities with primary responsibility with respect to the FMI.

Advance notification

390. Relevant authorities should provide advance notification, where practicable and otherwise as soon as possible thereafter, regarding pending material regulatory changes and adverse events with respect to the FMI that may significantly affect another authority's regulatory, supervisory, and oversight interests. In particular, for cross-border or multicurrency FMIs, where other authorities may have an interest in the FMI's observance of the principles, advance notification arrangements should take into account the authorities' responsibilities with respect to the FMI's potential systemic importance to their jurisdictions. The views of other authorities put forward through consultations should be considered, as appropriate, in connection with regulatory actions taken with respect to the FMI, including when the FMI is in a recovery, wind-down, or resolution scenario.

Timely access to trade data

391. Authorities primarily responsible for the regulation, supervision, and oversight of a TR that maintains data pertaining to other jurisdictions should coordinate with other relevant authorities to ensure timely and effective access to trade data and establish an appropriate data access process that is fair and consistent with the responsibilities of the other relevant authorities, to the extent legally permissible. All relevant authorities should mutually support each other's access to trade data in which they have a material interest in furtherance of their regulatory, supervisory, and oversight responsibilities, regardless of the particular organisational form or geographic location of a TR.

No pre-emption of statutory authority

392. Each authority maintains its discretion to discourage the use of an FMI located in another jurisdiction or the provision of services to such an FMI if, in the authority's judgment, the FMI is not prudently designed or managed or the principles are not adequately observed. This would be an option that would only be considered in extreme circumstances, and typically after consultation with the authority or

authorities with primary responsibility for the supervision or oversight of the FMI. An example of such a circumstance would be if the authority concerned had been unable to secure changes to the FMI's risk controls which it regarded as necessary given the FMI's systemic importance in its jurisdiction. An authority exercising such discretion should provide a clear rationale for the action taken both to the FMI and to the authority or authorities with direct responsibility for the supervision or oversight of the FMI.

393. Cooperative arrangements between authorities in no way prejudice the statutory or legal or other powers of each participating authority, nor do these arrangements constrain in any way an authority's powers to fulfil its statutory or legislative mandate or its discretion to act in accordance with those powers. International cooperation for enforcement activities regarding persons other than FMIs is not covered by this responsibility. For IOSCO members, international cooperation for enforcement activities is governed by the *Multilateral memorandum of understanding for cooperation concerning consultation and cooperation and the exchange of information*.[173]

[173] See IOSCO, Multilateral memorandum of understanding for cooperation concerning consultation and cooperation and the exchange of information, May 2002.

DEFINITIONS

The following definitions are intended to assist readers in their understanding of the terms used in this standard. The list of definitions provided is by no means exhaustive.

Fatwā	A juristic opinion given by the Sharīʻah board on any matter pertinent to Sharīʻah issues, based on the appropriate methodology.
Institutions offering Islamic financial services (IIFS)	Institutions offering Islamic financial services that include Islamic banks, Islamic insurance/*takāful* institutions, Islamic windows and Islamic collective investment schemes
Islamic collective investment scheme (ICIS)	Any structured financial scheme that, fundamentally, meets all the following criteria: (a) Investors have pooled their capital contributions in a fund (whether that fund is in a separate legal entity or is held pursuant to a contractual arrangement) by subscribing to units or shares of equal value. Such units or shares constitute, in effect, claims of ownership of the undivided assets of the fund (which can consist of financial or non-financial assets), and give rise to the right or obligation to share in the profits or losses derived from those assets. Whether or not the Islamic collective investment scheme is managed by the institutions that established or sponsored it, it is financially accountable separately from those institutions (i.e. it has its own assets and liabilities profile) but excluding *ṣukūk*. (b) The fund is established and managed in accordance with Sharīʻah rules and principles.
Jump-to-default risk	The risk that a financial product, whose value directly depends on the credit quality of one or more entities, may experience sudden price changes due to an unexpected default of one of these entities.
Members of the Sharīʻah board	Jurists specialising in contemporary transactional jurisprudence, who are well acquainted with and experienced in the Islamic financial system in particular and the Islamic economic system in general. They issue binding Sharīʻah pronouncements and recommendations, and oversee the task of supervising and auditing the institution.
Sharīʻah	The practical divine law deduced from its legitimate sources: the Qur'ān, Sunnah, Consensus (*ijmāʻ*), Analogy (*qiyās*) and other approved sources of the Sharīʻah.
Sharīʻah advisory firm	An entity that, depending on its size and capacity, provides Sharīʻah advisory services, including Sharīʻah reviews, as

	well as advice on Sharīʻah-compliant product development, as part of its professional services.
Sharīʻah board	An independent body set up or engaged by the institution offering Islamic financial services to supervise its Sharīʻah compliance and governance system.
Sharīʻah non-compliance risk	An operational risk resulting from non-compliance of the institution with the rules and principles of Sharīʻah in its products and services.
Ṣukūk	Certificates of equal value representing undivided shares in the ownership of tangible assets, usufructs and services or (in the ownership of) the assets of particular projects or special investment activity.
Takāful	A mutual guarantee in return for the commitment to donate an amount in the form of a specified contribution to the participants' risk fund, whereby a group of participants agree among themselves to support one another jointly for the losses arising from specified risks.
Zakāh	An obligatory financial contribution disbursed to specified recipients that is prescribed by the Sharīʿah on those who possess wealth exceeding a minimum amount that is maintained in their possession for one lunar year.

APPENDIX: MAPPING OF THE CPSS-IOSCO DOCUMENTS AND THE IFSB APPROACH

Preamble

The IFSB works to complement the prudential and supervisory standards issued by the international standard setters, particularly in this context the CPSS-IOSCO Documents, by addressing the specificities of Islamic finance in the FMIs with the aim of contributing to the soundness and stability of the ICM industry. The mapping below depicts the areas where and how the specificities of Islamic FMIs have been addressed, which includes additions or modifications as well as some deletions relating to practices not commonly found in the ICM. The additions to the Key Considerations (KC) and Questions are also accompanied by detailed explanations within the Explanatory Notes for each Principle. Some Principles where there are no changes to KC or Questions also include some additional explanatory notes on application of Islamic finance specificities.

CPIFRFMI	CPSS-IOSCO Principles	Key Considerations (KC)		Questions	
		New	Modified	New	Modified
Principle 1	**Principle 1**		KC 5		Q.1.5.1
Principle 2	**Principle 2**				Q.2.2.1
Principle 3	**Principle 3**	No change			
Principle 4	**Principle 4**		KC 3, KC 4	Q.4.4.9	
Principle 5	**Principle 5**		KC 1		Q.5.5.1
Principle 6	**Principle 6**		KC 1		
Principle 7	**Principle 7**		KC 1 KC 5 KC 8	Q.7.8.2	
Principle 8	**Principle 8**	No change			
Principle 9	**Principle 9**	KC 6		Q.9.1.2	
Principle 10	**Principle 10**	(Additional Explanatory Notes)			
Principle 11	**Principle 11**				Q.11.4.3 Q.11.6.1
Principle 12	**Principle 12**	No change			
Principle 13	**Principle 13**	(Additional Explanatory Notes)			
Principle 14	**Principle 14**			Q.14.2.2	

Principle 15	**Principle 15**	No change			
Principle 16	**Principle 16**		KC 4	Q.16.4.2	Q.16.4.1
Principle 17	**Principle 17**	(Additional Explanatory Notes)			
Principle 18	**Principle 18**	No change			
Principle 19	**Principle 19**	No change			
Principle 20	**Principle 20**				Q.20.1.1
Principle 21	**Principle 21**			Q.21.1.2	
Principle 22	**Principle 22**	No change			
Principle 23	**Principle 23**	KC 6		Q.23.6.1	
Principle 24	**Principle 24**	No change			
Principle 25	**(No equivalent)**	New			
Responsibility A	**Responsibility A**	No change			
Responsibility B	**Responsibility B**	(Additional Explanatory Notes)			
Responsibility C	**Responsibility C**	(Additional Explanatory Notes)			
Responsibility D	**Responsibility D**		KC 1		
Responsibility E	**Responsibility E**	KC 11	KC 2	Q.E.11.1	

Annex A

Assessment methodology for the principles for FMIs

This section describes the assessment methodology for the principles for FMIs, which was prepared to assist FMIs, authorities and IFIs in assessing an FMI's observance of the PFMI. This assessment methodology is designed to cover all the types of FMIs to which the principles apply – that is, systemically important payment systems, CSDs, SSSs, CCPs and TRs.

General considerations

In conducting an assessment of an FMI's observance of the principles, assessors should take into account a number of considerations, including but not limited to:

Customisation of the assessment for each FMI

Assessments will differ by FMI. Assessors may have to exercise some judgment in determining which activities or functions of an FMI are to be assessed, especially where multiple FMIs belong to the same legal entity, where individual FMIs perform multiple functions, or where the clearing and settlement processes are independent of one another. Further, as specified in each principle, certain principles and key considerations are applicable only to specific types of FMIs. For example, the CPIFRFMI reflects the fact that TRs do not face credit or liquidity risks, and therefore the principles and key considerations pertaining to these risks do not apply to TRs.

Applicability of the assessment methodology to public-sector-owned FMIs

The assessment methodology is intended to assist assessors in correctly applying the principles to both private and public sector FMIs, taking into account differences in ownership structures and organisational forms. The principles are applicable to FMIs owned or operated by the public sector, in particular central banks. In general, central banks and other public sector entities should apply the same standards to FMIs that they own or operate as those that are applied to similar private sector FMIs. However, because of the circumstances of their ownership, public sector FMIs are outside the scope of some assessment questionsand require specific guidance under a few principles. Appropriate questions have been formulated to help assess observance by public-sector-owned FMIs.

General instructions for completing an assessment of the principles

There are the six steps involved in an assessment of the principles: (1) determine the appropriate scope of an assessment; (2) gather facts on each applicable key consideration; (3) develop key conclusions for each principle; (4) assign a rating for each principle; (5) indicate an appropriate time frame for addressing each identified issue of concern, if any, including a discussion of priorities; and (6) prepare an assessment report.

Step 1: Determine the appropriate scope of the assessment

Assessors should give careful consideration to the scope of the assessment. The scope of the assessment should include determining which FMIs to assess, which FMI operations and services to assess, and which principles to assess. This scope should be clearly communicated to the assessed FMIs in advance of the assessment being undertaken.

Determining which FMIs to assess

Authorities for FMIs are expected to regularly assess FMIs that are deemed systemically important. As noted earlier, statutory definitions of systemic importance may vary somewhat across jurisdictions, but in general a payment system is systemically important if it has the potential to trigger or transmit systemic disruptions. The presumption is that all CSDs, SSSs, CCPs and TRs are systemically important, at least in the jurisdiction where they are located.

External assessors will typically rely on the domestic authorities' designation of FMIs as systemically important but may define certain FMIs as being outside the scope of the assessment (e.g. national FMIs processing small-value transactions that pose little contagion risk outside the domestic jurisdiction). Further, external assessors may choose to focus on the FMIs that are the most relevant to global financial stability.

Determining which FMI operations and services to assess

Each FMI should be assessed separately. An FMI has been defined as a multilateral system among participating financial institutions, including the operator of the system, used for the purposes of recording, clearing or settling payments, securities or other financial

transactions.[174] FMIs can differ significantly in organisation, function and design. FMIs can be legally organised in a variety of forms, including associations of financial institutions, non-bank clearing corporations and specialised banking organisations. They can be defined as separate legal entities or parts of another legal entity.

Assessors must determine which of the FMI's operations and services are within scope and identify the entity to be assessed for each assessment (such as a legal entity, part of a legal entity or several legal entities). If the FMI subject to the assessment has established links to settle cross-border trades, assessors may need to consider how best to coordinate with the authorities in those relevant jurisdictions if such coordination is essential for completing the assessment.

The following examples illustrate how the complexity of FMIs' arrangements could be addressed to clearly define an assessment scope that is consistent with the application of the functional definition of an FMI.

- *Two or more FMIs operate under one entity*. A single operator might operate two FMIs that fulfil clearly distinct roles and only share some arrangements, such as a single operator that operates both a CSD and an RTGS system. If the CSD and RTGS system share the same legal and governance arrangements but use different operational and risk management arrangements, the two key functions could be assessed separately.
- *Two or more FMIs are integrated into one entity.* A single operator might operate two FMIs whose key functions are highly interrelated and complementary, such as a CSD that operates an SSS. If the CSD and SSS share the same legal and governance arrangements and use highly integrated operational and risk management arrangements, then the two key functions could be assessed as if they were one FMI.

[174] The general analytical approach of the CPIFRFMI and the assessment methodology is to consider FMIs as multilateral systems, inclusive of their participants, as stated in the definition of FMI. In market parlance, however, the term FMI may be used to refer only to a legal or functional entity that is set up to carry out centralised, multilateral payment, clearing, settlement or recording activities and, in some contexts, may exclude the participants that use the system. This difference in terminology or usage may introduce ambiguity at certain points. To address this issue, the CPIFRFMI and this assessment methodology may refer to an FMI and its participants, or to an FMI including its participants, to emphasise the coverage of a principle or other text where this is not clear from the context. The definition of FMIs excludes bilateral relationships between financial institutions and their customers, such as traditional correspondent banking.

- *One FMI serves different markets with different arrangements.* The assessment of the FMI can be split into separate assessments if the FMI has developed clearly distinct arrangements for the different markets it serves.

In each of these cases, assessors should identify and address, as appropriate, any interdependencies.

Determining which principles to assess

An assessment might be conducted (a) against all relevant principles as part of a periodic comprehensive review of an FMI's safety and efficiency, (b) against one or more individual principles that relate to a proposed new service offering or a proposed material change to an FMI's risk management framework, (c) against one or more individual principles that may be targeted for a thematic (or "horizontal") review across one or more FMIs, or (d) against one or more individual principles that are relevant to certain problems identified before the assessment and may be targeted at one or more FMIs.

Step 2: Gather facts on each applicable key consideration

Assessors should gather sufficient facts to be able to develop key conclusions for each principle. Section 3 contains questions organised by key consideration for each of the 25 principles. These questions are tools to help assessors gather facts to determine whether an FMI is observing the principles. Additionally, the information collection process may serve as an early indicator of the extent to which the FMI being assessed is meeting expectations for providing access to information.

The questions outlined in Section 3 are intended to inform and guide the judgment of assessors, not to replace it. Assessors' questions and efforts should focus on the issues where risk is greatest, and risk assessment is most valuable when it is forward-looking and based on sound judgment. The questions are not intended to serve purely as a checklist. Moreover, the questions are not intended to be exhaustive, and assessors could, at their discretion, pose additional or different questions as needed – in particular, to address the different levels of complexity of the FMI. In some instances, assessors may want to modify specific questions to reflect particular risk factors or circumstances specific to the assessment. The list of questions used by assessors should provide at least a level of information equivalent to that included in the assessment methodology.

In order to build a contextual base for developing key conclusions and assigning ratings, assessors should develop a general understanding of an FMI's basic business activities,

operations and services, processes, rules and procedures. Therefore, assessors should keep in mind the following overarching questions for each principle during the assessment:

1. What is the FMI's approach or method for observing the principle?
2. What analyses, processes and rationale does the FMI use to ensure the effectiveness of its approach or method for observing the principle?
3. How does the FMI measure and monitor its ongoing performance in observing the principle?
4. What other evidence is available to help monitor the FMI's ongoing performance in observing the principle?

Step 3: Develop key conclusions for each principle

Key conclusions are an assessor's overall determination of the extent to which a principle is observed by the FMI being assessed. Key conclusions should be drawn for each applicable principle and should be provided in the form of a narrative summary based on the facts gathered by assessors. When drawing a key conclusion, assessors should:

1. Summarise the FMI's practices and achievements, as warranted.
2. Identify any gaps or shortcomings as they emerge from the facts gathered by assessors.
3. For each gap or shortcoming, describe any associated risks or other issues and the implications for observing the principle.
4. For each gap or shortcoming, determine if it is an issue of concern based on the associated risks and issues. An issue of concern is a risk management flaw, a deficiency, or a lack of transparency or effectiveness that needs to be addressed. Assessors should distinguish between the three categories of issues of concern: (a) issues of concern that are serious and warrant immediate attention; (b) issues of concern that could become serious if not addressed promptly; and (c) issues of concern that should be addressed in a defined timeline.

Key conclusions will serve as building blocks for assigning a rating as described in step 4.

Step 4: Assign a rating for each principle

This assessment methodology rating framework provides guidance for assigning a rating to each principle. The IFIs will use this rating framework, particularly in the FSAP context.

National authorities may also use this rating framework for their own assessments, as appropriate. Ratings are assigned at the level of each principle.

Rating framework for assessments of principles

The rating framework is built on the gravity and urgency of the need to remedy identified issues of concern.

Observed	The FMI observes the principle. Any identified gaps and shortcomings are not issues of concern and are minor, manageable and of a nature that the FMI could consider taking them up in the normal course of its business.
Broadly observed	The FMI broadly observes the principle. The assessment has identified one or more issues of concern that the FMI should address and follow up on in a defined timeline.
Partly observed	The FMI partly observes the principle. The assessment has identified one or more issues of concern that could become serious if not addressed promptly. The FMI should accord a high priority toaddressing these issues.
Not observed	The FMI does not observe the principle. The assessment has identified one or more serious issues of concern that warrant immediate action. Therefore, the FMI should accord the highest priority to addressing these issues.
Not applicable	The principle does not apply to the type of FMI being assessed becauseof the particular legal, institutional, structural or other characteristics of the FMI.[175]

Guidance on the assignment of ratings

Assessors should assign ratings to reflect conditions at the time of the assessment. The rating is built on the key conclusions and reflects the assessors' judgment regarding the type or impact of the risks and other issues associated with each identified gap or shortcoming. Plans

[175] The case of a principle not being assessed does not fall within this category. A list of principles not covered in the assessment, and an accompanying explanation of the reasons for the exclusion, are part of the introduction to the assessment (see, for example, the introduction to Annex B).

for improvements should be noted in the assessment report, where appropriate, but should not influence judgments about observance of the principles.

The assessment should note instances where observance of a particular principle could not be adequately assessed and explain why. For example, certain information may not have been provided, or key individuals or institutions may have been unavailable to discuss important issues. Unsatisfied requests for information or meetings should be documented in writing. In such cases, the assessors may treat such information gaps as evidence of a concern.

In determining a rating for a principle, assessors should first identify whether the principle is not applicable. This is the case when a principle does not apply to the type of FMI being assessed (e.g. Principle 4 on credit risk for a TR and Principle 6 on calculation of collateral for a payment system). This can also be the case when the principle applies to the type of FMI being assessed but the specific, legal, institutional, structural or other characteristics of the FMI's jurisdiction or design make the principle irrelevant (e.g. Principle 4 on credit risk for an RTGS system with no (intraday) credit provided to participants).

When rating observance of an applicable principle, assessors should determine whether it is observed. For a principle to be observed, any identified gaps or shortcomings should not be issues of concern and should be minor, manageable and of a nature that the FMI could consider taking them up in the normal course of business. When a principle is not fully observed, assessors must decide on the degree of observance. Ratings should take into account not only the number of issues identified but also the level of concern they present. It is important to note that there may be multiple issues with differing degrees of concern. In such cases, the assessor typically should assign the principle a rating that reflects the assessor's judgment of the severity of the most serious concerns identified:

- If the assessment has identified one or more serious issues of concern that warrant immediate action and therefore should be addressed with the highest priority, the principle should be rated as "not observed".
- If the above condition does not apply and the assessment has identified one or more issues of concern that could become serious if not addressed promptly and that should be addressed with a high priority, the principle should be rated as "partly observed".
- If the above conditions do not apply and the assessment has identified one or more issues of concern that the FMI should address and follow up on in a defined timeline, the principle should be rated as "broadly observed".

Assessors, however, should ensure that the rating appropriately reflects the circumstances. For example, in some cases, the combination of a number of smaller gaps or shortcomings may form an issue of concern.

Step 5: Indicate the appropriate time frame for addressing each issue of concern

An assessment report should conclude with (a) a clear identification of the issues of concern that need to be addressed, if any, and (b) an indication of an appropriate time frame for addressing each identified issue of concern. In preparing recommendations for a principle that is not rated as "observed", assessors should provide recommendations that address any identified issues of concern and serve to improve the FMI's level of observance of the principle.

There is no simple process for defining an appropriate time frame, but some basic steps may be useful to consider. Assessors should identify the areas in which less than full observance of principles may lead to serious concerns. Degrees of importance have not been assigned to the individual principles because the principles as a group contribute to the safety and efficiency of the FMI. Assessors will have to come to an understanding of priorities based upon their judgment as to the deficiencies that pose the greatest risks or greatest lack of transparency or effectiveness to the FMI.

Having identified priority areas, assessors should then determine the actions needed in each area. In the case of assessments completed by domestic authorities, the FMI itself is often expected to prepare an action plan for review by the authorities. In the case of assessments completed by external assessors, the assessors often prepare recommendations and discuss them with the relevant authorities. A reasonable time frame in which an issue of concern should be addressed should also be specified.

Where appropriate, assessors should also provide recommendations that serve to rectify any gaps or shortcomings that are not issues of concern. There is no requirement or specified timeline for implementing these recommendations, and the FMI could consider taking them up in the normal course of its business.

Step 6: Prepare an assessment report

An assessment report template for assessing an FMI against the principles is provided in Annex B. An assessment report template for assessing a country's FMIs and authorities against the principles and responsibilities is provided in Annex D.

Annex B

Assessment methodology for the responsibilities of authorities

This section describes the assessment methodology for the responsibilities of authorities for FMIs and for assisting authorities and IIFS in assessing a jurisdiction's observance of the CPIFRFMI. This assessment methodology may be used to assess authorities individually and collectively. In the context of an FSAP, authorities will be assessed at the jurisdictional level.

General instructions for completing an assessment of the responsibilities

There are six steps involved in an assessment of the responsibilities: (1) determine the appropriate scope of an assessment; (2) gather facts on each key consideration; (3) develop key conclusions for each responsibility; (4) assign a rating for each responsibility; (5) indicate an appropriate time frame for addressing each issue of concern, if any, including a discussion of priorities; and (6) prepare an assessment report.

Step 1: Determine the appropriate scope of the assessment

Assessors should give careful consideration to the scope of the assessment. The scope should be clearly communicated to the assessed authorities in advance of the assessment being undertaken.

Determining which authorities to assess

In general, authorities should be assessed at a jurisdictional level and not at the level of the individual regulatory, supervisory or oversight authority. This allows assessors to perform a comprehensive assessment of the authorities' observance of the responsibilities and to identify potential regulatory gaps or overlaps in the jurisdiction. This approach is consistent with Responsibility E, which deals with, among other things, cooperation between domestic authorities. Also, this approach does not preclude that some actions be addressed to a specific authority within the country's oversight framework or to a particular type of FMI. In addition, authorities may wish to assess, jointly or individually, the jurisdiction's own observance of the responsibilities.

There may, however, be situations where assessing the regulatory, supervisory and oversight framework that applies to a specific FMI is appropriate, such as in cases of FMIs with cross-

border activity. Foreign authorities, for example, may be interested not only in the general adherence of the domestic authorities to the responsibilities but also in a more specific assessment of the way the responsibilities are applied with respect to a particular FMI. It may also be appropriate to assess the responsibilities in conjunction with a category of FMIs (e.g. to understand how national authorities fulfil their responsibilities towards CCPs).

Step 2: Gather facts on each key consideration

Assessors should gather sufficient facts in order to develop key conclusions for each responsibility. Section 6 of this report contains questions organised by the key consideration for each of the five responsibilities. These questions are tools to help assessors gather facts to determine whether authorities are fulfilling the responsibilities. Additionally, the information collection process may serve as an early indicator of the extent to which the authorities being assessed are meeting expectations for providing access to information.

The questions outlined in Section 3 are intended to inform and guide the judgment of assessors, not to replace it. The questions are not intended to serve purely as a checklist. Moreover, the questions are not intended to be exhaustive, and assessors could, at their discretion, pose additional or different questions as needed. In some instances, assessors may want to modify specific questions to reflect circumstances specific to the assessment. The list of questions used by assessors should provide at least a level of information equivalent to that included in the assessment methodology.

In order to build a contextual base for developing key conclusions and assigning ratings, assessors should develop a general understanding of the authorities' jurisdiction, rules and processes. Therefore, assessors should keep in mind the following overarching questions for each responsibility during the assessment:

1. What is the authorities' approach or method for observing the responsibility?
2. What analyses, processes and rationale do the authorities use to ensure the effectiveness of their approach or method for observing the responsibility?
3. How do the authorities measure and monitor their ongoing performance in observing the responsibility?
4. What other evidence is available to help monitor the authorities' ongoing performance in observing the responsibility?

Step 3: Develop key conclusions for each responsibility

Key conclusions are an assessor's overall determination of the extent to which the intent of a responsibility is observed by the authorities being assessed. Key conclusions should be drawn for each responsibility and should be provided in the form of a narrative summary based on the facts gathered by assessors. When drawing a key conclusion, assessors should:

1. Summarise the authorities' practices and achievements, as warranted.

2. Identify any gaps or shortcomings as they emerge from the facts gathered by assessors.

3. For each gap or shortcoming, describe any associated risks or other issues and the implications for observing the responsibility.

4. For each gap or shortcoming, determine if it is an issue of concern based on the associated risks and issues. An issue of concern is an oversight or supervisory flaw, a deficiency, or a lack of transparency or effectiveness that needs to be addressed. Assessors should distinguish between the three categories of issues of concern: (a) issues of concern that are serious and warrant immediate attention; (b) issues of concern that could become serious if not addressed promptly; and (c) issues of concern that should be addressed in a defined timeline.

Key conclusions will serve as building blocks for assigning a rating as described in step 4.

Step 4: Assign a rating for each responsibility

This assessment methodology rating framework provides guidance for assigning a rating to each responsibility. The IFIs will use this rating framework, particularly in the FSAP context. National authorities may also use this rating framework for their own self-assessments. Ratings are assigned at the level of each responsibility.

Rating framework for assessments of responsibilities

The rating framework is built on the gravity and urgency of the need to remedy identified issues of concern.

Observed	The authorities fulfil the responsibility. Any identified gaps and shortcomings are not issues of concern and are minor, manageable and of a nature that the authorities could consider taking them up in the

normal conduct of their activities.

Broadly observed	The authorities broadly fulfil the responsibility. The assessment has identified one or more issues of concern that the authorities should address and follow up on in a defined timeline.
Partly observed	The authorities partly fulfil the responsibility. The assessment has identified one or more issues of concern that could become serious if not addressed promptly. The authorities to which these concerns apply should accord a high priority to addressing these issues.
Not observed	The authorities do not fulfil the responsibility. The assessment has identified one or more serious issues of concern that warrant immediate action. Therefore, the authorities to which these concerns apply should accord the highest priority to addressing these issues.
Not applicable	The responsibility does not apply to the authorities because of the particular institutional framework or other conditions faced by the authorities with respect to this responsibility.[176]

Guidance on the assignment of ratings

Assessors should assign ratings to reflect conditions at the time of the assessment. The rating is built on the key conclusions and reflects assessors' judgment regarding the type or impact of the risks and other issues associated with each identified gap or shortcoming. Plans for improvements should be noted in the assessment report, where appropriate, but should not influence judgments about observance of the responsibilities.

The assessment should note instances where observance of a particular responsibility could not be adequately assessed and explain why. For example, certain information may not have been provided or key individuals or institutions may have been unavailable to discuss important issues. Unsatisfied requests for information or meetings should be documented in

[176] The case of a responsibility not being assessed does not fall within this category. A list of responsibilities not covered in the assessment, and an accompanying explanation of the reasons for the exclusion, are part of the introduction to the assessment (see, for example, the introduction to Annex C).

writing. In such cases, the assessors may treat such information gaps as evidence of a concern.

When rating observance of a responsibility, assessors should first determine whether it is observed. For a responsibility to be observed, any identified gaps or shortcomings should not be issues of concern and should be minor, manageable and of a nature that the authorities can consider taking them up in the normal conduct of their activities. When the responsibility is not fully observed, assessors must decide on the degree of observance. Ratings should take into account not only the number of issues identified but also the level of concern they present. It is important to note that there may be multiple issues with differing degrees of concern. In such cases, the assessor typically should assign the responsibility a rating that reflects the assessor's judgment of the severity of the most serious concerns identified:

- If the assessment has identified one or more serious issues of concern that warrant immediate action and therefore should be addressed with the highest priority, the responsibility should be rated as "not observed".
- If the above condition does not apply and the assessment has identified one or more issues of concern that could become serious if not addressed promptly and that should be addressed with a high priority, the responsibility should be rated as "partly observed".
- If the above conditions do not apply and the assessment has identified one or more issues of concern that authorities should address and follow up on in a defined timeline, the responsibility should be rated as "broadly observed".

Assessors, however, should ensure that the rating appropriately reflects the circumstances. For example, in some cases, the combination of a number of smaller gaps or shortcomings may form an issue of concern.

Step 5: Indicate the appropriate time frame for addressing each issue of concern

An assessment report should conclude with (a) a clear identification of the issues of concern that need to be addressed, if any, (b) an indication of an appropriate time frame for addressing each identified issue of concern, and (c) an identification of the parties that are best positioned to address each identified issue of concern. In preparing recommendations for a responsibility that is not rated as "observed", assessors should provide recommendations that address any identified issues of concern and serve to improve the authorities' level of observance of the responsibility. Assessors should also indicate to whom these recommendations are addressed.

There is no simple process for defining an appropriate time frame, but some basic steps may be useful to consider. Assessors should identify the areas in which less than full observance of the responsibilities leads to serious concerns. Degrees of importance to the individual responsibilities have not been assigned in the CPIFR(FMI) because the responsibilities as a group contribute to the safety and efficiency of FMIs. Assessors will have to come to an understanding of priorities based upon their judgment as to the deficiencies that pose the greatest risks or greatest lack of transparency or effectiveness of the authorities.

Having identified priority areas, assessors should then determine the actions needed in each area. Where domestic authorities conduct self-assessments, they should prepare the action plan themselves. In the case of assessments completed by external assessors, the assessors often prepare recommendations and discuss them with the authorities. In each case, the party best positioned to initiate each action or recommendation should be identified. A reasonable time frame in which an issue of concern should be addressed should also be specified.

Where appropriate, assessors should also provide recommendations that serve to rectify any gaps or shortcomings that are not issues of concern. There is no requirement or specified timeline for implementing these recommendations, and the authorities could consider taking them up in the normal course of their activities.

Step 6: Prepare an assessment report

An assessment report template for assessing authorities against the responsibilities is provided in Annex C. An assessment report template for assessing a country's FMIs and authorities against the principles and responsibilities is provided in Annex D.

Annex C

Assessment report template on the observance of the principles for FMIs

I. Executive summary

This section should highlight the key findings of the assessment.

II. Introduction

This section should introduce the report and include the following key information regarding the assessment:

- Assessor: Identify the entity and assessors conducting the assessment.
- Objective of the assessment: Identify the objective and context of the assessment.
- Scope of the assessment: Identify the FMI, the set of the FMI's operations and services, and the set of principles assessed.
- Methodology of the assessment: Identify the process followed in conducting the assessment. If not all principles were assessed, an explanation should be provided of why certain principles were not assessed.
- Sources of information in the assessment: Identify the main sources of information, including public and non-public sources, used in conducting the assessment. These sources may include written documentation (such as other assessments, surveys, questionnaires, reports, studies, relevant laws and regulations, and regulatory and industry guidance) and conversations with the FMI itself, authorities and relevant industry stakeholders (such as participants, other FMIs, stock exchanges, custodians, securities brokers and end user associations).

In addition, this section should mention any difficulties in conducting the assessment, such as lack of information or cooperation and any factors limiting the assessment process or its scope. Further, an account of any information requested but not obtained should be given.

III. Overview of the payment, clearing and settlement landscape

This section should provide a general description of the role of the FMI in the overall payment, clearing and settlement landscape; a general description of the FMI's operations and services; and summary statistics to help understand the scope of the FMI's activities. The general description and summary statistics should help to facilitate comparisons with other FMIs, as appropriate.

This section should also provide a general description of the regulatory, supervisory or oversight framework relating to the FMI; a brief description of the relevant authorities; and a summary of the major changes and reforms implemented in the recent past or scheduled for the near future.

IV. Summary assessment

Summary assessment of observance of the principles

This section should summarise the key findings of the detailed assessment of the principles. For each principle, the assessment should:

- highlight the FMI's key practices and achievements;
- list identified issues of concern; and
- comment on each principle that is not fully observed and provide the main reasons for assigning a rating of "broadly observed", "partly observed" or "not observed"; indicate the risk factors that might influence the degree of non-observance; and indicate whether the issues of concern are being addressed, as well as the degree of observance that will be achieved if current efforts proceed as envisaged.

This section should conclude with a summary of the results of the principle-by-principle assessment of observance (see Table 1).

Table 1

Ratings summary

Assessment category	Principle
Observed	*e.g. Principles 1, 3, 6 and 8*
Broadly observed	
Partly observed	

Not observed	
Not applicable	

Recommendations for the FMI

This section should list the suggested steps to improve the FMI's observance of the principles. In Table 2, assessors should list issues of concern and other gaps or shortcomings in the FMI's observance of the principles along with any recommendations to address them and the time frame within which the FMI should take action.

Assessors should list recommendations in order of priority, from the most urgent to be implemented or addressed to the least urgent. Assessors also should explain the manner in which the recommended action would lead to an improvement in the level of observance of the principle. If an FMI has plans for improvements under way, this should be noted in the comments section. Any specific obstacles to observance should also be noted.

Some principles may be listed multiple times in Table 2 when multiple issues of concern or other gaps or shortcomings have been identified.

Table 2

Prioritised list of recommendations

Principle	Issue of concern or other gap or shortcoming	Recommended action and comments	Time frame for addressing recommended action

V. Detailed assessment report

The detailed assessment table should provide a description of the FMI with regard to applicable key considerations, key conclusions and the assessment rating for each applicable principle (see Table 3).

Table 3
Detailed assessment of observance of the principles

For each applicable principle	
Principle X *Text of the principle*	
Key consideration 1 *Text of key consideration*	*This section should provide information on the practices of the FMI as they relate to the key consideration. Assessors should be guided by the questions for each applicable key consideration and, where applicable, should organise information according to the subject headers provided in the question set in Section 3. Only the key considerations applying tothe category of FMI being assessed should be selected.* *Responses should reflect the actual practices followed by FMI operators and participants. The list of questions in Section 3 is a tool tohelp assessors gather facts and is not intended to be a checklist. The specific answers to each of these questions should not necessarily be part of the assessment report.*
⋮	⋮
Key consideration N *Text of key consideration*	*Supporting facts…*
Key conclusions for principle	*This section should provide a narrative summary of key information collected by the assessors for each principle based on the supportingfacts collected for each applicable key consideration. The narrative summary should summarise the FMI's practices and achievements, describe the seriousness of any issues of concern, and identify any other gaps or shortcomings.*
Assessment of principle	*This section should state whether the principle is "observed", "broadly observed", "partly observed", "not observed" or "not applicable". This section should also give the rationale for the assigned rating.*
Recommendations and comments	*This section should provide recommended actions and other commentsfor each identified issue of concern and any other gaps or shortcomings.*

Annex D

Assessment report template on the observance of the responsibilities of authorities for FMIs

I. Executive summary

This section should highlight the key findings of the assessment.

II. Introduction

This section should introduce the report and include the following key information regarding the assessment:

- Assessor: Identify the entity and assessors conducting the assessment.
- Objective of the assessment: Identify the objective and context of the assessment.
- Scope of the assessment: Identify the set of authorities; authorities' responsibilities over regulation, supervision and oversight of FMIs; and responsibilities assessed.
- Methodology of the assessment: Identify the process followed in conducting the assessment. If not all responsibilities were assessed, an explanation should be provided of why certain responsibilities were not assessed.
- Sources of information in the assessment: Identify the main sources of information, including public and non-public sources, used in conducting the assessment. These sources may include written documentation (such as other assessments, surveys, questionnaires, reports, studies, relevant laws and regulations, and regulatory and industry guidance) and conversations with authorities and relevant industry stakeholders.

In addition, this section should mention any difficulties in conducting the assessment, such as lack of information or cooperation and any factors limiting the assessment process or its scope. Further, an account of any information requested but not obtained should be given.

III. Overview of the payment, clearing and settlement landscape

This section should provide a general description of the overall payment, clearing and settlement landscape; a general description of the regulatory, supervisory and oversight framework relating to the FMIs in the jurisdiction; a brief description of the relevant authorities; and a summary of the major changes and reforms implemented in the recent past or scheduled for the near future.

IV. Summary assessment

Summary assessment of observance of the responsibilities

This section should summarise the key findings of the detailed assessment of the responsibilities. For each responsibility, the assessment should:

- highlight the authorities' key practices and achievements;
- list identified issues of concern; and
- comment on each responsibility that is not fully observed and provide the main reasons for assigning a rating of "broadly observed", "partly observed" or "not observed"; indicate the risk factors that might influence the degree of non-observance; and indicate whether the issues of concern are being addressed, as well as the degree of observance that will be achieved if current efforts proceed as envisaged.

This section should conclude with a summary of the responsibility-by-responsibility assessment of observance (see Table 1).

Table 1

Ratings summary

Assessment category	Responsibility
Observed	*e.g. Responsibilities A and C*
Broadly observed	*e.g. Responsibilities B, D and E*
Partly observed	
Not observed	
Not applicable	

Recommendations for authorities

This section should list the suggested steps to improve authorities' observance of the responsibilities. In Table 2, assessors should list issues of concern and other gaps or shortcomings in the authorities' observance of the responsibilities, along with any recommendations to address them, the relevant authority to address the recommendation, and the time frame within which the relevant authority should take action.

Assessors should list recommendations in order of priority, from the most urgent to be implemented or addressed to the least urgent. Assessors should also explain the manner in which the recommended action would lead to an improvement in the level of observance of the responsibilities. Any specific obstacles to observance should also be noted. If authorities have plans for improvements under way, this should be noted in the comments section.

Some responsibilities may be listed multiple times in Table 2 when multiple issues of concern or other gaps or shortcomings have been identified.

Table 2

Prioritised list of recommendations

Responsibility	Issue of concern or other gap or shortcoming	Recommended action and comments	Relevant parties	Time frame for addressing recommended action

V. Detailed assessment report

The detailed assessment table should provide a description with regard to the key considerations, key conclusions and the assessment rating for each responsibility (see Table 3).

Table 3

Detailed assessment of observance of the responsibilities

For each responsibility

Responsibility X *Text of the responsibility*	
Key consideration 1 *Text of key consideration*	*This section should provide information on the practices of the authorities as they relate to the key consideration. Assessors should be guided by the questions for each key consideration and, where applicable, should organise information according to the subject headers provided in the question set in Section 3.* *Responses should reflect the actual practices followed by authorities. The list of questions in Section 6 is a tool to help assessors gather facts and is not intended to be a checklist. The specific answers to each of these questions should not necessarily be part of the assessment report.*
⋮	⋮
Key consideration N *Text of key consideration*	*Supporting facts…*
Key conclusions for responsibility	*This section should provide a narrative summary of key information collected by the assessors for each responsibility based on the supporting facts collected for each key consideration. The narrative summary should summarise the authorities' practices and achievements, describe the seriousness of any issues of concern, and identify any other gaps or shortcomings.*
Assessment of responsibility	*This section should state whether the responsibility is "observed", "broadly observed", "partly observed", "not observed" or "not applicable". This section should also give the rationale for the assigned rating.*
Recommendations and comments	*This section should provide recommended actions and other comments for each identified issue of concern and any other gaps or shortcomings.*

Annex E

Country assessment report template on observance of the principles for FMIs

I. Executive summary

This section should highlight the key relevant findings of the assessment.

II. Introduction

This section should introduce the report and include the following key information regarding the assessment.

- Assessor: Identify the entity and assessors conducting the assessment.
- Objective of the assessment: Identify the objective and context of the assessment.
- Scope of the assessment: Identify the FMIs, the set of FMIs' operations and services (including instruments and markets served) and the set of principles assessed. Identify the set of authorities; authorities' responsibilities over regulation, supervision and oversight of FMIs; and responsibilities assessed.
- Methodology of the assessment: Identify the process followed in conducting the assessment. If not all principles or responsibilities were assessed, an explanation should be provided on why certain principles or responsibilities were not assessed.
- Sources of information in the assessment: Identify the main sources of information, including public and non-public sources, used in conducting the assessment. These sources may include written documentation (such as other assessments, surveys, questionnaires, reports, studies, relevant laws and regulations, and regulatory and industry guidance) and conversations with the FMIs themselves, authorities and relevant industry stakeholders (such as participants, stock exchanges, custodians, securities brokers or end user associations).

In addition, this section should mention any difficulties in conducting the assessment, such as lack of information or cooperation and any factors limiting the assessment process or its scope. Further, an account of any information requested but not obtained should be given.

III. Overview of the payment, clearing and settlement landscape

This section should provide a general description of the overall payment, securities or derivatives clearing and settlement architecture.

The section should also provide a general description of the FMIs' operations and services; and summary statistics to help understand the scope of the FMIs' activities, including by comparison with other FMIs of the same type, either from the same country or from other relevant countries.

The section should also provide a general description of the regulatory, supervisory or oversight framework relating to the FMIs; a brief description of the relevant authorities; and a summary of the major changes and reforms implemented in the recent past or scheduled for the near future.

IV. Summary assessment

IV.1 Summary assessment of observance of the principles

This section should summarise the key findings of the detailed assessment of principles. Assessors should state the main findings of the detailed assessment of observance of the principles under the following main categories: (a) general organisation (Principles 1 to 3); (b) credit and liquidity risk management (Principles 4 to 7); (c) settlement (Principles 8 to 10); (d) central securities depositories and exchange-of-value settlement systems (Principles 11 and 12); (e) default management (Principles 13 and 14); (f) general business and operational risk management (Principles 15 to 17); (g) access (Principles 18 to 20); (h) efficiency (Principles 21 and 22); (i) transparency (Principles 23 and 24); and (j) Sharīʿah governance (Principle 25).

Under each category, assessors should, for each FMI:

- highlight the FMI's key practices and achievements;
- list identified issues of concern; and
- comment on each principle that is not fully observed and provide the main reasons for assigning a rating of "broadly observed", "partly observed" or "not observed"; indicate the risk factors that might influence the degree of non-observance; and indicate whether the issues of concern are being addressed, as well as the degree of

observance that will be achieved if current efforts proceed as envisaged.

This section should conclude with a summary of the results of the principle-by-principle assessment of observance (see Table 1).

Table 1
Ratings summary for principles: [name of FMI]

Assessment category	Principle
Observed	*e.g. Principles 1, 3, 6 and 8*
Broadly observed	
Partly observed	
Not observed	
Not applicable	

IV.2 Summary assessment of observance of the responsibilities

This section should summarise the key findings of the detailed assessment of responsibilities. For each responsibility, the assessment should:

- highlight the authorities' key practices and achievements;
- list identified issues of concern; and
- comment on each responsibility that is not observed and provide the main reasons for assigning a rating of "broadly observed", "partly observed" or "not observed"; indicate the risk factors that might influence the degree of non-observance; and indicate whether the issues of concern are being addressed, as well as the degree of observance that will be achieved if current efforts proceed as envisaged.

This section should conclude with a summary of the results of the responsibility-by-responsibility assessment of observance (see Table 2).

Table 2
Ratings summary for responsibilities

Assessment category	Responsibility
Observed	*e.g. Responsibilities A and C*
Broadly observed	*e.g. Responsibilities B, D and E*
Partly observed	
Not observed	
Not applicable	

IV.3 Summary assessment of market-wide recommendations

This section should present any findings with regard to the assessment of market-wide recommendations, where applicable (such as FSAPs and technical assistance).[177]

IV.4 Recommendations for FMIs

This section should list the suggested steps to improve the FMIs' observance of the principles. In Table 3, assessors should list their recommendations to address each identified issue of concern and other gaps or shortcomings in the FMIs' observance of the principles and the time frame within which the FMIs should take action.

Assessors should list recommendations by FMI and in order of priority, from the most urgent to be implemented or addressed to the least urgent. Assessors should explain the manner in which the recommended action would lead to an improvement in the level of observance of the principle. If FMIs have plans for improvements under way, this should be noted in the comments section (although the future impact of those plans will not be reflected in the current assignment of an assessment category). Any specific obstacles to observance should be noted.

Some principles may be listed multiple times in the table when multiple issues of concern or other gaps or shortcomings have been identified.

Table 3
Prioritised list of recommendations for [name of FMI]

Principle	Issue of concern or other gap or shortcoming	Recommended action and comments	Time frame for addressing recommended action

[177] For external assessments which cover the overall national payment system in the country, this section could be used to include comments on any relevant matter identified as an improvement opportunity for the broad payment, clearing and settlement environment.

IV.5 Recommendations for authorities

This section should list the suggested steps to improve authorities' observance of the responsibilities. In Table 4, assessors should list their recommendations to address each identified issue of concern and other gaps or shortcomings in the authorities' observance of the responsibilities and the time frame within which the relevant authority should take action.

Assessors should list recommendations in order of priority, from the most urgent to be implemented or addressed to the least urgent. Assessors should explain the manner in which the recommended action would lead to an improvement in the level of observance of the responsibilities. If authorities have plans for improvements under way, this should be noted (although the future impact of those plans will not be reflected in the current assignment of an assessment category). Any specific obstacles to observance should be noted. The parties that are best positioned to address each identified issue of concern should be indicated.

Some responsibilities may be listed multiple times in the table when multiple issues of concern or other gaps or shortcomings have been identified.

Table 4
Prioritised list of recommendations for authorities

Responsibility	Issue of concern or other gap or shortcoming	Recommended action and comments	Relevant parties	Time frame for addressing recommended action

IV.6 Other recommendations on market-wide issues

This section should present any recommendations stemming from the assessment of market-wide recommendations, where applicable (such as FSAPs and technical assistance).[178]

[178] For external assessments which cover the overall national payment system in the country, this section could be used to include comments on any relevant matter identified as an improvement opportunity for the broad payment, clearing and settlement environment.

V. Detailed assessment reports

Detailed assessment table of observance of the principles

The detailed assessment table should provide a description of the FMI(s) with regard to applicable key considerations, key conclusions and an assessment rating for each by principle (see Table 5). An example of this template as applied to Principle 1 on legal basis is also provided (see Table 5 – example).

Table 5
Detailed assessment of observance of the principles

For each applicable principle	
Principle X *Text of the principle*	
Key consideration 1 *Text of key consideration*	*This section should provide information on the practices of the FMI as they relate to the key consideration. Assessors should be guided by the questions for each applicable key consideration and, where applicable, should organise information according to the subject headers provided in the question set in Section 3. Only the key considerations applying tothe category of FMI being assessed should be selected.* *Responses should reflect the actual practices followed by FMI operators and participants. The list of questions in Section 5 is a tool tohelp assessors gather facts and is not intended to be a checklist. The specific answers to each of these questions should not necessarily be part of the assessment report.*
⋮	⋮
Key consideration 1 *Text of key consideration*	*Supporting facts…*
Key conclusions for principle	*This section should provide a narrative summary of key information collected by the assessors for each principle based on the supporting facts collected for each applicable key consideration. The narrative summary should summarise the FMI's practices and achievements, describe the seriousness of any issues of concern, and identify any other gaps or shortcomings.*
Assessment of principle	*This section should state whether the principle is "observed", "broadly observed", "partly observed", "not observed" or "not applicable". This section should also give the rationale for the assigned rating.*
Recommendations and comments	*This section should provide recommended actions and other comments for each identified issue of concern and any other gaps or shortcomings.*

Table 5 – example

Example table for detailed assessment of observance of principles

Principle 1: Legal basis An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.	
Key consideration 1 The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.	Material aspects and relevant jurisdictions *Insert supporting facts*
	Legal basis for each material aspect *Insert supporting facts*
Key consideration 2 An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.	*Insert supporting facts*
Key consideration 3 An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant,participants' customers, in a clearand understandable way.	*Insert supporting facts*
Key consideration 4 An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.	Enforceability of the rules, procedures and contracts *Insert supporting facts*
	Degree of certainty for rules and procedures *Insert supporting facts*
Key consideration 5 An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.	*Insert supporting facts*
Key conclusions for Principle 1	*Insert narrative*
Assessment of Principle 1	*Insert assessment*
Recommendations and comments	*Insert recommendations and comments*

Detailed assessment of observance of the responsibilities

The detailed assessment table should provide a description with regard to the key considerations, key conclusions and the assessment rating for each responsibility (see Table 6). An example of this template as applied to Responsibility B is also provided (see Table 6 – example).

Table 6
Detailed assessment of observance of the responsibilities

For each responsibility	
Responsibility X *Text of the responsibility*	
Key consideration 1 *Text of key consideration*	*This section should provide information on the practices of the authorities as they relate to the key consideration. Assessors shouldbe guided by the questions for each key consideration and, where applicable, should organise information according to the subject headers provided in the question set in Section 3.* *Responses should reflect the actual practices followed by authorities. The list of questions in Section 6 is a tool to help assessors gather facts and is not intended to be a checklist. The specific answers to each of these questions should not necessarily be part of the assessment report.*
⋮	⋮
Key consideration N *Text of key consideration*	*Supporting facts…*
Key conclusions for responsibility	*This section should provide a narrative summary of key information collected by the assessors for each responsibility based on the supporting facts collected for each key consideration. The narrative summary should summarise the authorities' practices and achievements, describe the seriousness of any issues of concern, and identify any other gaps or shortcomings.*
Assessment of responsibility	*This section should state whether the responsibility is "observed", "broadly observed", "partly observed", "not observed" or "not applicable". This section should also give the rationale for the assigned rating.*
Recommendations and comments	*This section should provide recommended actions and other comments for each identified issue of concern and any other gaps or shortcomings.*

Table 6 – example

Example table for detailed assessment of observance of responsibilities

Responsibility B: Regulatory, supervisory, and oversight powers and resources Central banks, market regulators, and other relevant authorities should have the powers and resources to carry out effectively their responsibilities in regulating, supervising, and overseeing FMIs.	
Key consideration 1 Authorities should have powers or other authority consistent with their relevant responsibilities, including the ability to obtain timely information and to induce change or enforce corrective action.	Powers or other authority consistent with relevant responsibilities *Insert supporting facts*
	Power to obtain timely information *Insert supporting facts*
	Powers to induce change or enforce corrective action *Insert supporting facts*
Key consideration 2 Authorities should have sufficient resources to fulfil their regulatory, supervisory, and oversight responsibilities.	Resources *Insert supporting facts*
	Legal protections *Insert supporting facts*
Key conclusions for Responsibility B	*Insert narrative*
Assessment of Responsibility B	*Insert assessment*
Recommendations and comments	*Insert recommendations and comments*

Annex F

Summary of designs of payment systems, SSSs, and CCPs

This annex provides a high-level description of various institutional designs associated with payment systems, securities settlement systems (SSSs), and central counterparties (CCPs).

Payment systems

A payment system is a set of instruments, procedures, and rules for the transfer of funds between or among participants; the system includes the participants and the entity operating the arrangement. A payment system is typically based on an agreement between or among participants and the operator, and the transfer of funds is effected using an agreed-upon operational infrastructure. A payment system is generally categorised as either a retail payment system or a large-value payment system (LVPS). A retail payment system is a funds transfer system that typically handles a large volume of relatively low-value payments in such forms as cheques, credit transfers, direct debits, and payment card transactions. An LVPS is a funds transfer system that typically handles large-value and high-priority payments.

Organisational structures

A payment system can take on different organisational forms. A system may include a central entity that acts as the payment system operator (i.e. it runs the infrastructure that processes payment obligations, settlement obligations, or both; communicates withparticipants; and, in some cases, calculates net obligations), as a settlement institution (i.e. it debits and credits the balances in settlement accounts on its books), or as both. Further,the settlement institution may act as a type of central counterparty to each payment obligation (henceforth, payment), provide a guarantee of finality or settlement for each payment accepted to the system, or offer no form of settlement guarantee and let any associated risks remain with the participants. Other possible arrangements include an operating entity that is different from the settlement institution and operates some or all of the technical elements of the payment system on behalf of the participants or the settlement institution. In some cases, the operator will operate the system on behalf of a broader industry group, statutory body, or other organisation as part of

a payment scheme.[179] Still other arrangements may involve multilateral clearing and settlement systems with very limited roles for central entities.

Institutional designs

Payment systems can be categorised generally into real-time gross settlement (RTGS) systems, deferred (or designated-time) net settlement (DNS) systems, and "hybrid" systems. The key distinctions among these three systems involve the form and timing of settlement.

Real-time gross settlement systems

RTGS systems settle payments continuously in real time (i.e. without deferral) and on a gross basis, typically on a payment-by-payment basis. A payment is accepted by the system once it successfully passes the system's validity and conditionality checks (such as that the sender has sufficient funds or credit available to send the payment) and is typically unconditional and irrevocable.[180] If the payment cannot be validated, it is generally rejected back to the sender. If the payment is validated but does not pass the conditionality checks, the payment is either queued or rejected back to the sender (although other alternatives may exist in some systems). RTGS systems provide the advantage that payments are settled withfinality on a payment-by-payment basis in the course of the day, thus reducing intraday creditand liquidity exposures between participants. A downside of RTGS systems is that they require participants to have sufficient liquidity to cover the principal amount of each payment and can therefore require large amounts of intraday liquidity from participants.

Deferred net settlement systems

In DNS systems, payments are accumulated and netted throughout the day (or possibly once per day), and settlement of the net amount takes place at the end of the day, if not more

[179] Some countries may have payment schemes for one or more types of payments in which there exists a rule-making body that sets rules or provides some form of governance applicable to the operator, the participants, or a broader set of parties.

[180] Some systems may have a legal or technical sequence of events that differs from this description yet achieves the same purposes.

frequently intraday. By netting payment values among participants, DNS systems require significantly less liquidity for settlement, as compared to RTGS systems. However, DNS systems may expose participants to credit and liquidity risks for the period during which settlement is deferred. Settlement finality is only achieved at the end of the day (or at designated times during the day) in DNS systems and thus if there is no settlement guarantee, either by the system or its participants, there is no certainty that the payments willbe settled until that point in time. If a participant fails to meet its payment obligation whendue, some or all processed payments could be unwound, thereby exposing participants to liquidity risk and possibly credit risk depending on the design, rules, and legal framework of the payment system.

Hybrid systems and liquidity-saving mechanisms

In recent years, distinctions between RTGS and DNS systems have become less clear. Some DNS systems have increased the frequency of intraday final settlement to reduce risks associated with delayed settlement. Many RTGS systems have incorporated liquidity-saving features akin to netting in DNS systems in order to economise on participants' use of liquidity. A range of system designs with liquidity-saving mechanisms and settlement priority options are sometimes classified as hybrid systems.

In general, liquidity-saving mechanisms include frequent netting or offsetting of payments during the course of the operating day. A typical approach is to hold payments in a central queue and to net or offset those payments on a bilateral or multilateral basis at frequent intervals. To the extent that resulting potential net debit positions are fully covered, the payments can be settled immediately. Liquidity-saving mechanisms reduce the amount of liquidity needed relative to traditional RTGS systems by using the potential liquidity from a participant's incoming payments to settle outgoing payments via netting or offsetting. Liquidity-saving mechanisms also reduce settlement risk relative to DNS systems by providing intraday final settlement after each round of netting. However, systems with these mechanisms may require more liquidity than pure DNS systems, which typically conduct settlement once per day, and may involve greater settlement delays for some payments than pure RTGS systems.

Other payment system enhancements include the integration of recurrent netting or offsetting with real-time settlement functionality and the addition of prioritisation options for payment processing or settlement. Such functionality allows a participant either to settle a particular payment in real time (or near real time) or to place the payment in a queue for deferred settlement. In many cases, systems have adopted complex algorithms for settling payments.

For example, some systems first attempt to settle a payment on a gross basis. If gross settlement is not possible (e.g. due to insufficient funds or lack of available credit), the system attempts to bilaterally or multilaterally offset the payment against other pending payments, thereby reducing or eliminating the amount of liquidity required to settle the payment. A number of different optimisation routines can be used to match, offset, or net queued payments, and the complexity of these algorithms varies greatly. Some systems alsoallow participants to set settlement or processing priorities among different payments or payment types.

Payment process

Regardless of their design, payment systems typically have four conceptual stages of processing: submission, validation, conditionality, and settlement.

Submission

The first stage of the payment process is the submission of a payment to the payment system. A payment can take on a number of forms based on the type of payment being submitted (e.g. time-critical versus non time-critical payments; balances of ancillary systems or cash legs of securities transactions for LVPS; or ACH, debit or credit transfers for retail payment systems). Payments may differ based on the direction of funds flows (e.g. credit transfers or debit transfers), format, legal status, and medium (e.g. in electronic form or physical form). Also, some payments may be submitted as individual payments or as part of a file of payments.

Validation

Once a payment is submitted, it must pass through the payment system's validation procedures before it can be accepted for final settlement. The type of validation the payment system performs depends on its specific design, but typically includes verifying that the payment instruction includes certain key data elements. These validation procedures may also include security measures in addition to those employed by the network provider to verify the identity of the sender of the payment as well as to ensure the integrity and non-repudiation of the payment itself. In the event that the payment system cannot validate a payment, it is usually returned to the sending participant and is not considered eligible for settlement. If the validation is successful, the payment system subjects the payment to conditionality requirements.

Conditionality

Another key feature of a payment system's design is the set of conditions that a payment must meet in order for it to be accepted by the system and be settled. In the most straightforward case, after the payment has been validated, the only condition for settlement is whether the sender has sufficient funds available (or access to intraday credit).[181] If the payment exceeds the amount of funds available, the payment system may reject the payment. Alternatively, the system may temporarily place the payment in a system queue. The queued payment will be released from the queue at a later stage when all relevant conditions for settlement are satisfied. Even in systems without a queue, other options beside rejection may be possible. For example, in the case that a payment cannot be settled under a sender's limit, it is possible that the payment may still be settled subject to the sender undergoing a programme of ex-post counselling.

Settlement

A payment is final at the point in time when it becomes irrevocable and unconditional. This precise moment typically depends on the underlying legal regime and the rules of the payment system itself. In some systems, a payment becomes irrevocable as soon as the system validates it (i.e. queued payment orders cannot be revoked by the sender). However, the payment may not provide funds irrevocably and unconditionally to the receiver or the beneficiary until settlement occurs and is final. In other systems, payments remain revocable until settlement takes place and, lastly, in some systems a payment can only be revoked with the receiver's consent. In general, however, in an RTGS system, a payment becomes final after it is validated by the payment system and has passed the necessary conditionality checks.

In a DNS system, a payment is typically considered final upon final settlement at the designated time(s). However, in DNS systems, it is possible for settlement of the net amount to be final, while individual payments are not finally settled or paid. Some DNS systems may also provide an explicit settlement guarantee, either from the operator of the system or from

[181] Additional conditions for settlement may be created by limits set either by a participant or by the system. While limits typically restrict credit exposures, a recent feature in some systems providing continuous intraday finality is the introduction of position or sender limits in order to control the outflow of settlement funds.

the participants as a group. Such systems would also have financial mechanisms to support such a guarantee.

Conceptual stages of payment processing			
Submission	**Validation**	**Conditionality**	**Settlement**
• Sender submits payment to the payment system.	• The payment system validates payment's key data elements. • If the payment passes validation,the system accepts it subjectto conditionality. • If the payment fails any of the validation checks,it is rejected backto the sender.	• The payment system checks that necessary conditions for settlement are satisfied (such as sufficient funds availability and consistency with any established limits). • A payment that fails conditionality checks is either placed back in the queue until the necessary validation checks are passed or is rejected back to sender.	• Settlement finality occurs when the account of the receiver within the payment system has been credited and settlement is unconditional and irrevocable. In an RTGS system, final settlement follows immediately after the conditionality tests are passed. • In a DNS system,the payment is netted against other payments submitted to the system. Final settlement takes place at a designated time.
Time			

Securities settlement systems

An SSS enables securities to be transferred and settled by book entry according to a set of predetermined multilateral rules. An SSS typically allows transfers of securities either free of payment or against payment. When transfer is against payment, the SSS should provide delivery versus payment (DvP). *DvP is a settlement mechanism that links a securities transfer and a funds transfer in such a way as to ensure that delivery occurs* ***if and only if*** *the*

corresponding funds transfer occurs.[182] An SSS may be part of a formal organisational structure that includes other FMIs, or it may operate as a completely independent entity with its own governance structure and operating rules. An independent SSS may also provide additional securities clearing and settlement services, such as the confirmation of trades and settlement obligations. An SSS may operate independently of, or as part of, a CSD. Further, an SSS can provide a guarantee of finality or settlement from the system itself or its participants for each transaction accepted by the system, or offer no form of guarantee at all and simply provide the technical operations of an SSS.

Institutional designs

An SSS can use a number of DvP settlement mechanisms to settle obligations. These mechanisms may involve either the simultaneous settlement of securities and funds or the sequential settlement of securities and funds. In addition, settlement may occur on an obligation-by-obligation (i.e. gross) or on a net basis. There are three common models for achieving DvP. The first, DvP model 1, is a system that settles transfers for both securities and funds on a gross basis, with final (irrevocable and unconditional) transfer of securities from the seller to the buyer (delivery) occurring at the same time as final transfer of funds from the buyer to the seller (payment). The second, DvP model 2, is a system that settles securities transfer obligations on a gross basis, with final transfer of securities from the seller to the buyer occurring throughout the processing cycle, but settles funds transfer obligations on a net basis, with final transfer of funds from the buyer to the seller occurring at the end of the processing cycle. Lastly, the third, DvP model 3, is a system that settles transfer obligations for both securities and funds on a net basis, with final transfers of both securities and funds occurring at the end of the processing cycle.

Model 1: Gross, simultaneous settlements of securities and funds transfers

The essential characteristic of a DvP model 1 system is the simultaneous settlement of individual securities transfers and associated funds transfers. The system typically maintains

[182] An analogous settlement mechanism of delivery versus delivery (DvD) also exists. A DvD settlement mechanism is a securities settlement mechanism which links two or more securities transfers in such a way as to ensure that delivery of one security occurs if and only if the corresponding delivery(ies) of the other security(ies) occur(s).

both securities and funds accounts for participants and makes all transfers by book entry.[183] An "against payment" transfer is settled by debiting the seller's securities account, crediting the buyer's securities account, debiting the buyer's funds account, and crediting the seller's funds account.[184] All transfers are final at the instant the debits and credits are posted to the securities and funds accounts. Overdrafts (negative balances) on securities accounts are prohibited, but the settlement agent typically provides intraday credit on funds accounts to facilitate settlement, subject to the SSS's operating rules and risk management controls. An advantage of model 1 is that transactions become final on an obligation-by-obligation basis during the course of the settlement day, thus reducing credit and liquidity exposures among participants or between a participant and the SSS. A disadvantage of model 1, however, is that it requires participants to cover the principal value of the funds leg of each obligation, thus requiring a potentially large amount of liquidity from participants. To help mitigate this disadvantage, some systems have adopted mechanisms for both securities and funds similar to the liquidity-saving mechanisms used by payment systems.

Model 2: Gross settlements of securities transfers followed by net settlement of funds transfers

The essential characteristic of a DvP model 2 system is that securities transfers are settled on an obligation-by-obligation (gross) basis throughout the processing cycle, while funds transfers are settled on a net basis, typically at the end of the processing cycle. The system maintains securities accounts for participants. Funds accounts may be maintained by a separate entity, such as a commercial bank or a central bank. Securities are transferred by book entry. These securities transfers are usually provisional until the corresponding funds settlement becomes final. The corresponding funds transfers are irrevocable but not final. During the processing cycle (or perhaps at the end of the settlement day) the system calculates net balances of funds debits and credits. The net balances are settled at the end of the processing cycle when the net debit positions and net credit positions are posted to the books of the commercial bank or central bank that maintains the funds accounts. Settlement of funds transfers may occur once a day or several times a day. Like model 1 systems,

[183] If funds accounts are held by another entity, a communications link must be established between the operator of the securities transfer system and the entity handling participants' funds to provide the securities transfer system with real-time information on the completion of funds transfers.

[184] The system may also allow participants to make transfers "free of payment" (i.e. transfers of securities without a corresponding transfer of funds), or "free of transfers" (i.e. transfers of funds without a corresponding transfer of securities).

model 2 systems prohibit participants from overdrawing securities accounts but, in some cases, intraday credit is allowed for funds, subject to SSS or participant established limits or risk management controls. A securities transfer may be rejected if there are insufficient securities available in the seller's account or the seller fails any other risk management test. By netting the funds values among participants, a model 2 system requires significantly less liquidity for settlement, as compared to a model 1 system. A disadvantage to model 2, however, is the amount of risk created by the delay in settlement finality, which is only achieved at the end of the settlement day (or at designated times during the day).

Model 3: Simultaneous net settlement of securities and funds transfers

The essential characteristic of a DvP model 3 system is the simultaneous net settlement of both securities and funds transfer obligations. Settlement may occur once a day or at several times during the day. The system maintains securities accounts for participants. Funds accounts may be maintained by the SSS or a separate entity, such as a commercial bank or a central bank. Securities are transferred by book entry. During a processing cycle (or at the end of the settlement day), net balances of debits and credits to securities and funds accounts are calculated. However, book-entry transfers of securities do not occur until the end of the processing cycle. In the interim, all securities and funds transfers are provisional. At the end of the processing cycle (and possibly also at points during the processing cycle) the system checks whether those participants in a net debit position in securities and funds have sufficient balances to cover their net debits.[185] If a participant has insufficient balances,it may be notified and given an opportunity to obtain the necessary securities or funds. Final transfers of the net securities balances and net funds balances are executed if and only if all participants with net debit positions have sufficient balances of securities and funds. A disadvantage to model 3, however, is the potentially large liquidity exposures created if a participant fails to settle its net funds debit position. In this scenario, some or all of the defaulting participant's transfers may have to be unwound.

[185] In some systems a transfer would not be processed if it would result in a net debit position in a security larger than the participant's balance in that security. In other systems, however, an inadequate securities balance might not become evident until later in the processing cycle or at the end of the processing cycle.

Settlement process

The process of clearing and settling a securities trade includes three key steps: the confirmation of the settlement obligations; clearance (the calculation of the obligations of the counterparties resulting from the confirmation process); and settlement (the final transfer of securities in exchange for final transfer of funds in order to settle the obligations). An SSS, as strictly defined in this report, is involved in the settlement step of the clearing and settlement process, but many SSSs may be organised to provide additional securities clearing and settlement services, such as trade confirmation, settlement obligation validation, and securities safekeeping and custody.

Confirmation of settlement obligations

Once a trade is executed, the first step in the clearing and settlement process is to ensure that the counterparties to the trade (the buyer and the seller) agree on the terms, including the securities involved, the amounts to be exchanged, and the settlement date. This process of trade confirmation can take place in a variety of ways and the trading mechanism itself often determines how it occurs. For example, an electronic trading system may automatically produce a confirmed trade between the two counterparties. Other trades may be confirmed by exchanges, CCPs, or other organisations based on data submitted to them by the participants. In over-the-counter (OTC) markets, participants typically confirm the trade bilaterally.

Clearance

After trades have been confirmed, the next step in the process is clearance, which is the computation of the counterparties' obligations to make deliveries or payments on the settlement date. Clearance typically occurs in one of two ways, either on a gross basis, in which systems compute obligations for every trade individually, or a net basis. In some markets, a CCP interposes itself between the counterparties to a securities trade, taking on each party's obligation in relation to the other. A CCP typically reduces credit and liquidity risks for the trade counterparties by netting the underlying trade obligations. Netting arrangements are increasingly common in securities markets with high volumes of trades because properly designed netting algorithms produce significant reductions in gross exposures in such markets. Trade or obligation netting arrangements should be distinguished from settlement

or payment netting arrangements, in which underlying obligations are not extinguished but funds or securities transfers are settled on a net basis.

Settlement

Settlement of a trade involves the final transfer of the securities from the seller to the buyer (delivery) and the final transfer of funds from the buyer to the seller (payment). The processing of transfers by an SSS (and perhaps a payment system) often involves several stages before the transfers are final and the settlement process is complete. The obligation is discharged when the transfer becomes final – that is, an irrevocable and unconditional transfer.

Central counterparties

A CCP interposes itself between counterparties to contracts traded in one or more financial markets, ensuring the performance of open contracts. A CCP from a Sharīʿah perspective undertakes the settlement of transactions by delivery of assets and payments and is not a buyer or a seller in the transaction's origin. If a seller defaults in delivery of the asset, the CCP will, on the buyer's behalf, buy an asset and deliver to the buyer using in the first instance the collateral deposited by the seller to the CCP. If the buyer defaults, the CCP will make the payment on the buyer's behalf from the collateral he has deposited to the CCP. If the participant's funds are not sufficient, a CCP will use its own financial resources to settle a default and claim them back from the defaulting participant. If financial resources provided by other participants are used, the defaulting participant will remain liable until he pays them back (with no interest). A CCP has the potential to reduce its participants' risks significantly by multilaterally netting trades and imposing more-effective risk controls on all participants. A CCP's typical risk controls include requiring participants to provide collateral (usually in the form of collateral) to cover current and potential future exposures, collecting and paying mark-to-market losses and gains frequently to reduce current exposure, and requiring participants to share residual risk in the event that one or more participant defaults. A CCP's risk-reduction mechanisms can also reduce systemic risk in the markets it serves depending on the effectiveness of the CCP's risk controls and the adequacy of its financial resources.

Organisational structures

A CCP may be privately or publicly owned and operate on an at-cost or for-profit basis.[186] A CCP may serve one or more markets where trades are conducted on an exchange, over-the-counter, or both and, potentially, operate across multiple jurisdictions. A CCP may be vertically or horizontally integrated. Vertical integration in clearing is characterised by the formation of an integrated group, typically bringing trade and post-trade infrastructure providers under common ownership with other parts of the value chain. Horizontal integration occurs when a CCP expands clearing to more than one type of product or the products traded at more than one trading venue.[187]

Institutional designs

Institutional designs vary from one CCP to another. These differences may reflect risk characteristics of the instruments that the CCP clears, the characteristics of the participants for which the CCP clears, other external factors, and the design of the CCP's risk-management framework.

Factors affecting institutional design

A number of factors affect the institutional design of a CCP, including its risk management framework. Among these are the risk characteristics of the instruments that a CCP clears. For example, some instruments may be complex or have high market volatility, jump-to-default risk, or other hard-to-model sources of risk. Another important factor is the inherent liquidity of the market being served. A less liquid market will lead to, among other things, longer close-out times, increased difficulty in marking-to-market, and increased model risk. Other attributes affecting institutional design are the magnitude of the duration of the exposure between the CCP and its counterparties. Additionally, some contracts are characterised by trading practices that feature long periods between trade date and final settlement.

[186] Through membership fees and its own investments, and not through the transactions that it is obliged to settle.
[187] It should be noted that, in some jurisdictions, a CCP may be classified as either vertically or horizontally integrated; the two are not mutually exclusive.

Further, the design of a CCP may be influenced by the characteristics of the market participants for which the CCP clears. In some markets, a CCP may permit a diverse set of market participants to access its services. These participants can range from large banks to small non-bank dealers, and possibly buy-side firms. The range of market participants may affect the CCP's risk management framework, including the amount of financial resources, eligible collateral, and loss-sharing arrangements. The design of a CCP is further influenced by other external requirements, such as regulatory requirements, required levels of funding, and capital costs. A careful analysis of these, and the individual risk appetite of the CCP, will influence decisions towards one design over another. As such, legal and institutional arrangements will also influence the institutional design of a CCP. For example, the laws governing novation, open offer, and similar legal devices may vary by jurisdiction.

Form of guarantee

An important element of any CCP design is the legal mechanism for the CCP to become the counterparty to its participants' trades. In most cases, this is either novation or open offer. In novation, the original contract between the buyer and seller is discharged and two new contracts are created, one between the CCP and the buyer and the other between the CCP and the seller. The CCP thereby assumes the original parties' contractual obligations to each other. In an open-offer system, a CCP extends an open offer to act as a counterparty to its participants and is automatically and immediately interposed in a transaction at the moment the buyer and seller agree on the terms, either at the exchange or at the point of agreement over-the-counter. In an open offer system, if all pre-agreed conditions are met, the buyer and seller never have a contractual relationship. In jurisdictions that support them, both novation and open offer give market participants legal certainty that a CCP is obligated to effect settlement. Other legal mechanisms that allow a CCP to guarantee obligations and perform netting also exist such as explicit and legally binding, settlement guarantees.

Approaches to loss allocation

In the event of a participant default, a CCP will need access to financial resources to perform on its obligations and may need to initiate its loss-allocation procedures. In developing its loss-allocation procedures, a CCP may use both a defaulter-pay approach and a survivor-pay approach.

Defaulter-pay approach. In employing a defaulter-pay approach, a CCP seeks to cover a large proportion of its losses, if any, with the defaulting participant's financial resources. A CCP seeking to emphasise the use of the defaulter-pay approach would have higher levels of financial resources provided by the defaulter in the default waterfall, thereby making it less likely that losses will need to be allocated to non-defaulting participants through pooling-of-resources arrangements, such as a default fund. In these arrangements, the initial collateral provided by non-defaulting participants cannot be used to cover losses. Defaulter-pay approaches typically decrease moral hazard because each participant is responsible for a significant proportion of its own potential losses.

Survivor-pay approach. In employing a survivor-pay approach, a CCP would cover a residual portion of its losses with non-defaulting participants' resources through a pooling-of-resources arrangement, such as a default fund. Non-defaulting participants ofthe CCP will typically bear the risk of losses not covered by the defaulter's resources. There are a number of ways to allocate such losses among non-defaulting participants at different CCPs and in different jurisdictions. When applying this approach, the CCP should be attentive to the contagion risks created by interdependencies among participants.[188]

[188] Refer to paragraph 34.

Annex G

Oversight expectations applicable to critical service providers

The operational reliability of an FMI may be dependent on the continuous and adequate functioning of service providers that are critical to an FMI's operations, such as information technology and messaging providers. A regulator, supervisor, or overseer of an FMI may want to establish expectations for an FMI's critical service providers in order to support the FMI's overall safety and efficiency. The expectations should help ensure the operations of a critical service provider are held to the same standards as if the FMI provided the service. The expectations outlined below are specifically targeted at critical service providers and cover risk identification and management, robust information security management, reliability and resilience, effective technology planning, and strong communications with users. These expectations are written at a broad level, allowing critical service providers flexibility in demonstrating that they meet the expectations.

1. Risk identification and management

A critical service provider is expected to identify and manage relevant operational and financial risks to its critical services and ensure that its risk management processes are effective.

A critical service provider should have effective processes and systems for identifying and documenting risks, implementing controls to manage risks, and making decisions to accept certain risks. A critical service provider may face risks related to information security, reliability and resilience, and technology planning, as well as legal and regulatory requirements pertaining to its corporate organisation and conduct, relationships with customers, strategic decisions that affect its ability to operate as a going concern, and dependencies on third parties. A critical service provider should reassess its risks, as well as the adequacy of its risk management framework in addressing the identified risks, on an ongoing basis.

The identification and management of risks should be overseen by the critical service provider's board of directors (board) and assessed by an independent, internal audit function that can communicate clearly its assessments to relevant board members. The board is expected to ensure an independent and professional internal audit function. The internal audit function should be reviewed to ensure it adheres to the principles of a professional

organisation that governs audit practice and behaviour and is able to independently assess inherent risks as well as the design and effectiveness of risk management processes and internal controls. The internal audit function should also ensure that its assessments are communicated clearly to relevant board members.

2. Information security

A critical service provider is expected to implement and maintain appropriate policies and procedures, and devote sufficient resources to ensure the confidentiality and integrity of information and the availability of its critical services in order to fulfil the terms of its relationship with an FMI.

A critical service provider should have a robust information security framework that appropriately manages its information security risks. The framework should include sound policies and procedures to protect information from unauthorised disclosure, ensure data integrity, and guarantee the availability of its services. In addition, a critical service provider should have policies and procedures for monitoring its compliance with its information security framework.

This framework should also include capacity planning policies and change-management practices. For example, a critical service provider that plans to change its operations should assess the implications of such a change on its information security arrangements.

3. Reliability and resilience

A critical service provider is expected to implement appropriate policies and procedures, and devote sufficient resources to ensure that its critical services are available, reliable, and resilient. Its business continuity management and disaster recovery plans should therefore support the timely resumption of its critical services in the event of an outage so that the service provided fulfils the terms of its agreement with an FMI.

A critical service provider should ensure that it provides reliable and resilient operations to users, whether these operations are provided to an FMI directly or to both an FMI and its participants. A critical service provider should have robust operations that meet or exceed the needs of the FMI. Any operational incidents should be recorded and reported to the FMI and the FMI's regulator, supervisor, or overseer. Incidents should be analysed promptly by the

critical service provider in order to prevent recurrences that could have greater implications. In addition, a critical service provider should have robust business continuity and disaster recovery objectives and plans. These plans should include routine business continuity testing and a review of these test results to assess the risk of a major operational disruption.

4. Technology planning

The critical provider is expected to have in place robust methods to plan for the entire life cycle of the use of technologies and the selection of technological standards.

A critical service provider should have effective technology planning that minimises overall operational risk and enhances operational performance. Planning entails a comprehensive information technology strategy that considers the entire life cycle for the use of technologies and a process for selecting standards when deploying and managing a service. Proposed changes to a critical service provider's technology should entail a thorough and comprehensive consultation with the FMI and, where relevant, its participants. A critical service provider should regularly review its technology plans, including assessments of its technologies and the processes it uses for implementing change.

5. Communication with users

A critical service provider is expected to be transparent to its users and provide them sufficient information to enable users to understand clearly their roles and responsibilities in managing risks related to their use of a critical service provider.

A critical service provider should have effective customer communication procedures and processes. In particular, a critical service provider should provide the FMI and, where appropriate, its participants with sufficient information so that users clearly understand their roles and responsibilities, enabling them to manage adequately their risks related to their use of the services provided. Useful information for users typically includes, but is not limited to, information concerning the critical service provider's management processes, controls, and independent reviews of the effectiveness of these processes and controls. As a part of its communication procedures and processes, a critical service provider should have mechanisms to consult with users and the broader market on any technical changes to its operations that may affect its risk profile, including incidences of absent or non-performing risk controls of services. In addition, a critical service provider should have a crisis communication plan to handle operational disruptions to its services.

Annex H

FMI disclosure template

Responding institution: [FMI name]
Jurisdiction(s) in which the FMI operates: [list jurisdictions]
Authority(ies) regulating, supervising or overseeing the FMI: [list authorities]

The date of this disclosure is [date].
This disclosure can also be found at
[website address].For further information,
please contact [contact details].

I. Executive summary

This section should summarise the key points from the disclosure framework for Islamic FMIs (see section 1.6), including a brief overview of the FMI, its participants, its legal and regulatory framework, its primary risks, and its key risk management and other relevant practices.

II. Summary of major changes since the last update of the disclosure

This section should summarise the major changes to the FMI's organisation, services, design, rules, markets served and regulatory environment since its last disclosure. The FMI should note the sections in its disclosure where such changes are reflected.

III. General background on the FMI

General description of the FMI and the markets it serves

This section should provide basic, concise descriptions of the services offered and functions performed by the FMI. It should also provide an overview of the markets the FMI serves and the role it fulfils within those markets. Further, the section should include basic data and

performance statistics on its services and operations. An FMI should provide, for example, basic volume and value statistics by product type, average aggregate intraday exposures of the FMI to its participants, and statistics on the FMI's operational reliability.

General organisation of the FMI

This section should provide an overview of the organisational and governance structure of the FMI, including a description of the FMI's governance policies, governance structure and management structure.

Legal and regulatory framework

This section should provide an overview of the FMI's legal and regulatory framework, including the legal and ownership structure of the FMI, the legal basis for each material aspect of the FMI's activities, and the regulatory, supervisory and oversight framework for the FMI.

System design and operations

This section should explain the FMI's design and operations. It should include a clear description of the typical life cycle of the transaction process. The information should highlight how the FMI processes a transaction, including the timeline of events, the validation and checks to which a transaction is subjected, and the responsibilities of the parties involved.

IV. Principle-by-principle summary narrative disclosure

This section should provide a summary narrative disclosure for each applicable principle with sufficient detail and context to enable a reader to understand the FMI's approach to observing the principle.

Principle-by-principle summary narrative disclosure	
Principle X *Text of the principle*	
Summary narrative	*This section should provide a summary narrative disclosure with sufficient detail and context, as well as any other appropriate supplementary information, to enable readers to understand the FMI's approach to or method for observing the principle.* *In preparing its summary narrative disclosure for the principle, an FMI should refer to Section 5 of this report as guidance for the points of focus and level of detail it is expected to convey in its disclosure.* *Cross references to publicly available documents should be included, where relevant, to supplement the discussion.*
Answers to individual questions (optional)	*This section, which is optional, should provide answers to the individual questions outlined in Section 3 of this report. Answers to the questions should be organised by key considerations.*

V. List of publicly available resources

This section should list publicly available resources, including those referenced in the disclosure, that may help a reader understand the FMI and its approach to observing each applicable principle.