



December, 2017

TAKASBANK DISCLOSURE FRAMEWORK

Assessment of Takasbank's Compliance as
Central Counterparty against the CPMI-
IOSCO Principles for Financial Market
Infrastructures

The information provided in this disclosure reflects, entirely, the opinion of Takasbank and does not include any opinion belongs to Capital Markets Board, Banking Regulation and Supervision Agency, Central Bank of the Republic of Turkey or any other institutions. A copy of this document is published on the Takasbank's corporate website (www.takasbank.com.tr).

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Abbreviations

BCMS	Business Continuity Management System
BİAŞ	Borsa İstanbul A.Ş.
BRSA	Banking Regulation and Supervision Agency
CBRT	Central Bank of the Republic of Turkey
CCP	Central Counterparty
CMB	Capital Markets Board
COBIT	Control Objectives for Information and Related Technologies
CPMI	Committee on Payment and Market Infrastructures
CRA	Central Registry Agency Inc.
EFT	Electronic Funds Transfer System
EMIR	European Market Infrastructures Regulation
EMKT	Electronic Securities Transfer System
EPIAŞ	Energy Markets Operation Company
EU	European Union
GDDS	Government Domestic Debt Securities
ICAAP	Internal Capital Adequacy Assessment Process
IOSCO	International Organization of Securities Commission
ISE	Istanbul Stock Exchange (Borsa İstanbul)
IT	Information Technology
ITIL	Information Technology Infrastructure Library
SLM	Takas Istanbul Securities Lending Market
TEFAS	Turkey Electronic Fund Trade Platform
VIOP	Borsa İstanbul A.Ş. Futures and Options Market

I. EXECUTIVE SUMMARY

Takas Istanbul was founded in 1992 as a Joint Stock Company subject to the provisions of Turkish Commercial Code, under the leadership of Istanbul Stock Exchange (ISE) with the title of ISE Clearing, Settlement and Custody Inc. to provide clearing and settlement and custody service in the capital markets. After receiving ‘investment banking license’ in 1995 to offer banking services associated with the clearing and settlement and custody services, the Company acquired a ‘bank status’ and changed its title to ‘ISE Clearing, Settlement and Custody Bank Inc.’. With the entry into force of the Temporary Article 8 of the new Capital Markets Law No. 6362 on 30.12.2012, Takas Istanbul obtained a central clearing and settlement agency status and its title was changed in 2013 to ‘Istanbul Clearing, Settlement and Custody Bank Inc.’.

In Turkey, the lines of trading, clearing & settlement and custody services needed for the capital market instruments to change hands in a secure manner are carried out within a vertically integrated structure by Borsa Istanbul Inc. (BİAŞ) which incorporates the trading platforms under its roof, by ‘Istanbul Clearing, Settlement and Custody Bank Inc.’ (Takas Istanbul) which offers clearing & settlement and central counterparty service and by the ‘Central Registry Agency Inc.’ (CRA) which provides book-entry custody service.

62.25% of Takas Istanbul’s paid-in capital of 600 million TL belongs to Borsa Istanbul Inc. (formerly ISE) and the rest belongs to the banks and the brokerage firms (members of Takas Istanbul in various markets). 64.9% of the CRA’s paid-in capital of 36 million TL belongs to Takas Istanbul and 30.1% of it belongs to BİAŞ.

By using the legal basis provided by the new Capital Markets Law No. 6362 that has entered into force on 30.12.2012, Takas Istanbul first began to offer the Central Counterparty Services (CCP) as of September 2, 2013 in the Securities Lending Market (SLM) operated under its roof, and as of March 3, 2014, in the Futures and Options Market (VIOP) at BİAŞ. The CCP service is also planned to be provided in the spot “cash equity market” and the “debt instruments market” at BİAŞ after the completion of the technological infrastructure transformation carried out in accordance with the strategic partnership between BİAŞ and NASDAQ. Although Takas Istanbul is not yet offering CCP service in the said two markets, it has been authorized by the Central Bank of the Republic of Turkey as the Securities Settlement System operator in accordance with the Law No. 6493 on Payment and Securities Settlement Systems.

Takas Istanbul’s Central Counterparty legislation and business model has been designed by observing the CPMI-IOSCO’s (Committee on Payment and Market Infrastructures-International Organization of Securities Commission) core principles and the EMIR (European Market Infrastructures Regulation) (EU) No 648/2012 of the European Union and the technical standards (EU) No 152/2013 and (EU) No 153/2013 with regard to EMIR.

Takas Istanbul undertakes settlement finality of the positions generated in the markets to which central counterparty service is provided and, accordingly, it runs a multi-layered defense mechanism which would step-in should the need arise. This mechanism is comprised of the margin requirements received from the members, the funded guarantee fund established by the contributions of the members and the unfunded guarantee fund commitments of the members, plus Takas Istanbul capital

that can be used in default management. Takas Istanbul's CCP default management resources and their sequence for use are shown in Figure 1.

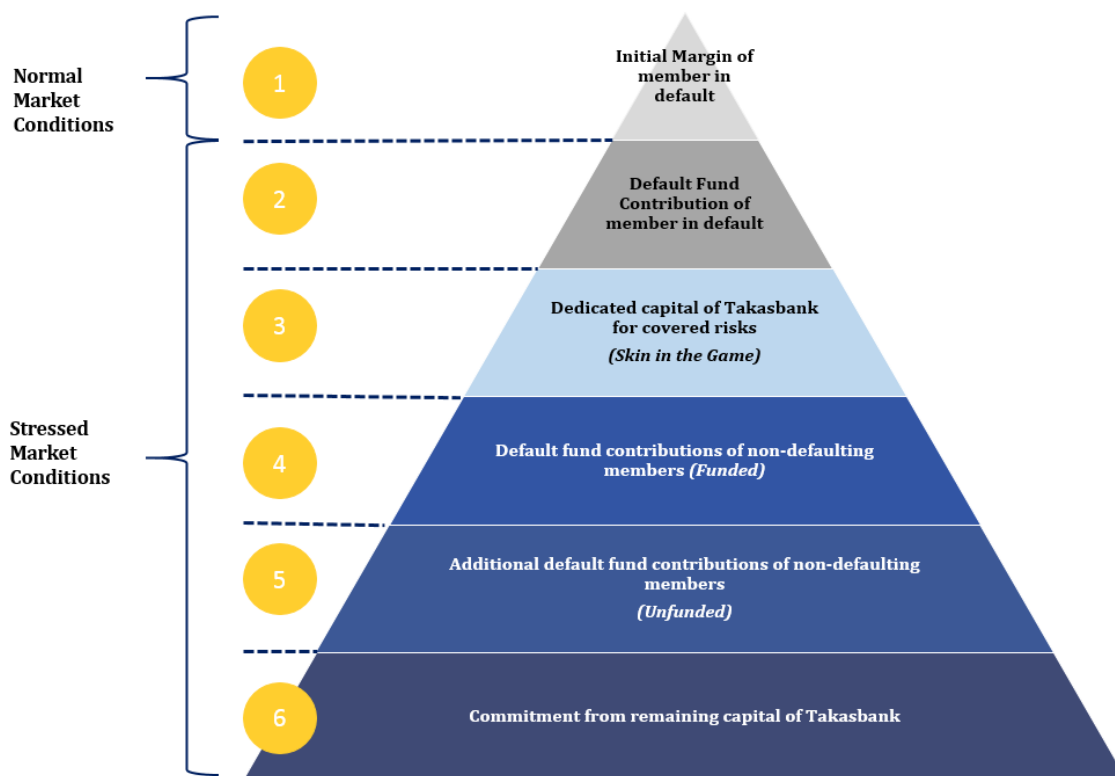


Figure 1- Takas Istanbul Default Management Resources and Order of Use

In Takas Istanbul CCP model, the safety of both the market and Takas Istanbul is addressed at the highest level. In CCP default management, Takas Istanbul's capital can be used in two separate tranches as allocation and commitment. The use of the portion allocated from Takas Istanbul capital to the CCP default management (*SIG-skin in the game*) before the guarantee fund contribution amounts of the non-defaulting members is compulsory. On the other hand, the portion committed from Takas Istanbul capital to the CCP default management shall be used after the funded and unfunded guarantee fund obligations of the non-defaulting members. Calculation of the capital allocated and committed from Takas Istanbul capital to the CCP default management is made in accordance with Basel 2 Capital Adequacy Arrangements and EMIR Master Document (EU) No 648/2012 of the European Union and EMIR technical arrangement (EU) 152/2013 and (EU) 153/2013 on the capital adequacy and default waterfall of the central counterparty institutions.

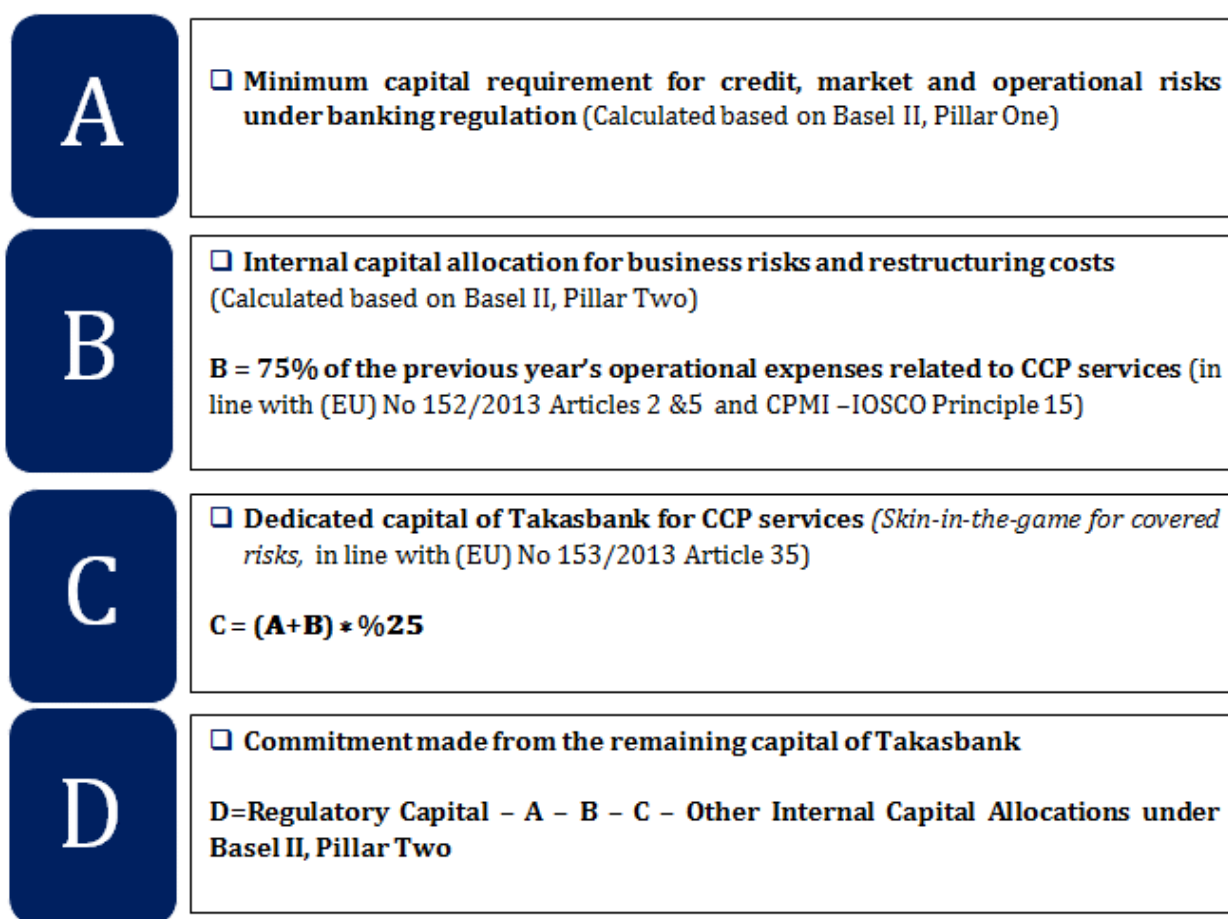


Figure 2- Capital 'allocated' and 'committed' to the CCP default management by Takas Istanbul

The use of Takas Istanbul capital in CCP default management is designed in a manner that would enable Takas Istanbul to survive under all circumstances, but also to use its entire capital remaining above the regulatory and internal capital obligations and even the payments to be made in advance by the stakeholders or other people and institutions as to be used for Takas Istanbul's potential capital increase as well as the equity and quasi-equity resource commitments (subordinated loans etc.) of irrevocable nature in default management, where necessary. And not content with these, Takas Istanbul is also equipped with profoundly effective recovery tools like making variation margin deductions, forced transfer or termination of positions in extreme market conditions. Hence, a structure has already been designed in which Takas Istanbul can continue its CCP activities and the order and stability can be ensured in the markets even during the severe crisis situations.

The quantitative indicators for the markets to which Takas Istanbul currently offers CCP service are given below, and the sum of capital allocated and committed by Takas Istanbul to the CCP default management is much greater than the size of guarantee fund funded by the members.

	Borsa İstanbul A.Ş. Futures and Options Market	Takas İstanbul Securities and Lending Market	Borsa İstanbul A.Ş. Equity Market	Borsa İstanbul A.Ş. Money Market
Instruments	Options and Futures (Index, equity, FX, commodity, energy, precious metals)	A and B group equities traded in Borsa İstanbul A.Ş. and Exchange Traded Funds (ETFs)	Equites, pre- emptive rights, exchange trade funds, warrants, certificates	Lending and borrowing on TL
Number of Clearing members*	73	53	58	32
Daily trading volume (two- sided)*	4,328,378	39,487	5,057,770	-(***)
Daily initial margin requirement*	945,106	96,401	109,604	502,666
Daily deposited margin requirement*	2,580,870	97,471	238,244	821,211
Daily size of funded Guarantee Fund*	146,086	3,696	34,646	5,120
Takasbank's dedicated capital** (thousand TL)	57,425	2,824	13,173	957
Takasbank's committed capital** (thousand TL)	181,543	8,928	41,646	3,024

* As of 30.06.2017
** Valid between 03/04/2017- 31/03/2018 - (thousand TL)
*** No open position in the Market as of 30/06/2017

Table 1- Quantitative indicators for the markets to which CCP service is provided

In Takas Istanbul, an organization was established which would enable the corporate-scale risks as well as the CCP risks to be effectively managed under the supervision and oversight of the Board of Directors, and the duties of the senior management and business units with regard to the CCP services were stipulated in an exclusive manner.

Though Takas Istanbul's banking operations are limited to its members (banks and other finance institutions) in various markets, all types of measures are taken to prevent the risks which may arise out of banking or other capital market (non-CCP) activities from constituting a threat to the CCP activities. These measures are also reinforced by the legal legislation at the level of law.

The international standards are achieved for the business continuity and information safety, and ISO 27001 (Information Security Management Systems) and ISO 22301 (Business Continuity Management System) certificates are obtained.

In assessing observance of Takas Istanbul's CCP activities of the core principles published on April 2012 by CPMI-IOSCO; except for the core Principle 11 related to the Central Securities Depositories (CSDs) and the core Principle 24 related to the Trade Repositories (TRs), 22 core Principles concerning the Central Counterparties (CCPs) were examined thoroughly by addressing them individually on the basis of 99 key considerations set forth for these principles.

At the end of each core principle, the outcome of Takas Istanbul's self assessment is explained by ticking one of the five rating scales given below, together with a brief justification thereof, in a compatible manner with the disclosure framework and assessment methodology published on December 2012 by CPMI-IOSCO.

Observed <input type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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In the assessment methodology published on December 2012 by CPMI-IOSCO, separate question sets recommended for use in assessing each key consideration have also been published. These questions are collectively presented as an attachment to this report. Hence, it should be kept in mind that explanations made in the subsequent pages with respect to each core principle on the basis of the key considerations are formed in accordance with the questions attached herewith.

In the assessment we made as Takas Istanbul to determine our Central Counterparty activities' level of observance against CPMI-IOSCO Core Principles for Financial Market Infrastructures, we determined our status as "observed" with all the 22 principles related to CCPs.

Yours sincerely,

14/12/2017

II. ASSESSMENT AGAINST THE CORE PRINCIPLES AND KEY CONSIDERATIONS

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 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 across jurisdictions.*

Key considerations

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

The general principles for the establishment, commencement of operations, activities of the central clearing and settlement institutions, the guarantee funds to be established by them with the participation of the members in case they assume the role for central counterparty and their supervision and oversight by the Capital Markets Board are stipulated in Article 77 with the heading 'Central Clearing and Settlement Institutions' of the Capital Markets Law No. 6362. In Article 78 with the heading 'Central Counterparty' of the Law No. 6362, on the other hand, the central counterparty activity is defined at the level of law, i.e. primary arrangement, as "the activity whereby the central counterparty institutions undertake the finalization of settlement by assuming the role and responsibility of the seller against the buyer and the buyer against the seller" and the general principles regarding the capital of the central clearing and settlement institutions that are to provide central counterparty service, their information technology infrastructure, risk management and internal control and internal audit systems are also stipulated.

In the secondary arrangements that have been issued based upon the Capital Markets Law No. 6362, the issues relating generally to the central clearing and settlement institutions and specifically to the activities of Takas Istanbul are stipulated. The secondary arrangements at the level of regulation that have been issued based upon the Law No. 6362 and their contents are outlined below.

General Regulation on the Establishment and Operating Principles of Central Clearing and Settlement Institutions (General Regulation): In the first paragraph of Article 77 with the heading

'Central Clearing and Settlement Institutions' of the Capital Markets Law No. 6362, it is stipulated that the principles and procedures regarding the capital of the central clearing and settlement institutions, their activities under the scope of the Law and the temporary and permanent suspension of their activities, their supervision, oversight, financial reporting standards, independent audit of their financial statements and their cooperation with other entities and institutions shall be determined by the Board. The General Regulation on the Establishment and Operating Principles of Central Clearing and Settlement Institutions prepared by the Capital Markets Board pursuant to this provision has entered into force by being published in the Official Gazette dated 30/05/2013 and numbered 28662. With the Regulation, it is intended to stipulate the general framework for the clearing and settlement institutions and the clearing and settlement transactions; and the establishment and operating principles of the clearing and settlement institutions, principles regarding their bodies, committees and specialized personnel, general procedures for the membership, clearing and settlement procedures and general principles regarding the central counterparty service are determined.

Istanbul Clearing, Settlement and Custody Bank Inc. Central Clearing and Settlement Regulation (Clearing and Settlement Regulation): In the second paragraph of Article 77 of the Law, it is enacted that the arrangements regarding the membership, collateral, clearing and settlement procedures, capital, income and other issues for the central clearing and settlement institutions shall be determined by the regulations prepared by the Board or, if the Board deems appropriate, by the relevant central clearing and settlement institutions and approved by the Board. Istanbul Clearing, Settlement and Custody Bank Inc. Central Clearing and Settlement Regulation prepared pursuant to this provision has entered into force by being published in the Official Gazette dated 18/07/2013 and numbered 28711. With the Regulation, it is intended to make common arrangements that would cover each market at the technical level by taking account of the characteristics of different markets to which Takas Istanbul offers service; and the legal infrastructure for the main clearing and settlement principles and practices such as netting, delivery versus payment, offsetting etc. which are applicable for all markets to which clearing and settlement service is provided and also have the equivalent in the international arrangements has been established. In addition to these, the general membership conditions for all markets to which clearing and settlement service is provided, the restriction and termination of the activities of the members, the default of the members, the margin requirements received by Takas Istanbul to ensure effective and uninterrupted continuance of the system, the collateral agreements and the principles and procedures regarding the guarantee fund which can be established in the markets to which central counterparty service is provided have been determined.

Istanbul Clearing, Settlement and Custody Bank Inc. Central Counterparty Regulation (CCP Regulation): The central counterparty practice has been included at the law level in the Turkish capital market legislation with Article 78 of the Capital Markets Law by taking account of the developments faced in the international arena after the global crisis as well as the decisions made in G-20 summits. The fourth paragraph of the said Article has stipulated that the conditions regarding the clearing and settlement membership and the types of membership in the markets and capital market instruments subject to the central counterparty practice, the obligations of the members and the minimum criteria related to the capital and the internal audit and risk management systems shall be regulated by the relevant clearing and settlement institution by obtaining the approval of the Capital Markets Board. Istanbul Clearing, Settlement and Custody Bank Inc. Central Counterparty Regulation prepared pursuant to this provision has entered into force by being published in the

Official Gazette dated 14/08/2013 and numbered 28735. While preparing the Regulation, the relevant international legislation was examined; and CPMI-IOSCO (Committee on Payment and Market Infrastructures-International Organization of Securities Commission) principles and the principles set forth in EMIR (European Market Infrastructures Regulation) were imported to the Regulation in a manner that would not create conflict with the local legislation.

Hence, the CCP service offered by Takas Istanbul relies fundamentally on;

- as a primary legal arrangement; Article 77 regulating the central clearing and settlement institutions, Article 78 regulating the central counterparty service, Article 79 stipulating the settlement finality and the pledge right, Article 73/2 regulating the preservation of collateral and the Temporary Article 8 giving the central clearing and settlement institution status to Takas Istanbul, of the Capital Markets Law No. 6362 (the Law) published in the Official Gazette dated 30.12.2012 and numbered 28513,
- and, as a secondary legal arrangement; the “General Regulation on the Establishment and Operating Principles of Central Clearing and Settlement Institutions (General Regulation)” approved by the Capital Markets Board (the Board) pursuant to Articles 77 and 78 of the Law and published in the Official Gazette dated 30.05.2013 and numbered 28662 and the “Istanbul Clearing, Settlement and Custody Bank Inc. Central Counterparty Regulation (CCP Regulation)” published in the Official Gazette dated 14.08.2013 and numbered 28735.

By taking account of the primary and secondary arrangements, Takas Istanbul also publishes Directives and Procedures which explain the processes specific to each market to which CCP service is to be provided.

In Turkey, except for the Securities Lending Market (SLM) operated by Takas Istanbul and Turkey Electronic Fund Trading (TEFAS) platforms, all organized markets in which the capital market instruments are traded operate under the roof of Borsa Istanbul Inc. (BİAŞ) being the founder and major shareholder of Takas Istanbul. To be able to offer CCP service in any market at BİAŞ, a service agreement is signed at first between Takas Istanbul and BİAŞ and then both this service agreement and the Market Directive prepared by Takas Istanbul for the relevant market are submitted for approval of the Capital Markets Board. Approval of the Market Directive by the Capital Markets Board means that Takas Istanbul is officially permitted to provide CCP service in that market.

Thereafter, in the markets where Takas Istanbul’s offering of CCP service is deemed appropriate by the Capital Markets Board, the admission process to the CCP membership begins and the “Central Counterparty Membership Agreements” are signed between Takas Istanbul and the institutions satisfying the admission criteria to the CCP membership. The membership agreements cover all critical issues related to the CCP service. For example, in the Central Counterparty Membership Agreement signed for the organized derivatives market VIOP at BİAŞ;

- the first paragraph of Article 4 stipulates that the CCP service in VIOP shall be offered through “open-offer method”,
- the second paragraph of Article 4 stipulates the sequence for use of the default management resources (collateral and guarantee fund contribution amounts of the defaulting member, funded

and unfunded guarantee fund contribution amounts of the non-defaulting members and the amounts allocated and committed from Takas Istanbul capital),

- the third paragraph of Article 4 stipulates that in the CCP service, Takas Istanbul deals only with the members and Takas Istanbul shall not be liable for the obligations of the members against their customers or the trading institutions and of the customers or the trading institutions against the members (in other words, the “principal” model shall be applied in the CCP service),
- the fourth paragraph of article 4 stipulates that Takas Istanbul may refrain from acting as a central counterparty in accordance with the principles set forth in the relevant legislation,
- Article 5 stipulates the clearing and settlement, collateral and guarantee fund contribution amount payment obligations for the transactions conducted by the members in the market,
- Article 6 stipulates the use of risk limits to be allocated by Takas Istanbul in favor of the members,
- Article 7 stipulates the legal regime applicable to the collateral to be delivered by the member to Takas Istanbul, the valuation of collateral and the margin calls, the accrual of interest on collateral and their return,
- Article 8 stipulates the guarantee fund,
- Article 9 stipulates under what conditions the members shall be deemed to have defaulted, the powers of Takas Istanbul (including the settlement, offset and retention rights) in case of default and that, the defaulting member shall have no right to object to the powers and dispositions of Takas Istanbul,
- Article 10 stipulates the segregation of the collateral and positions of the members and the customers,
- Article 11 stipulates the termination, tendering and force transfer of the positions in case of default of the members or under extraordinary circumstances and the deductions that can be made in the variation margins,
- Article 12 stipulates the porting of collateral and positions to another member in the pre-default and post-default situations,
- Article 13 stipulates the fees, charges and commissions,
- Article 19 stipulates the resolution of disputes,

and the critically important central counterparty practices whose principles have been prescribed in the Capital Markets Law No. 6362 and the secondary arrangements issued based upon this Law are incorporated as a right and/or obligation into the agreements executed separately with each member, and the central counterparty practices included in the legal capital market legislation are turned into a component of a legally enforceable and pursuable contractual relationship. The general arrangements with respect to the issuance, enforcement and pursuance of the agreements executed between the private law entities are included in the Laws of the Republic of Turkey, particularly in the Turkish Civil Code No. 4721, Turkish Code of Obligations No. 6098, Turkish Commercial Code No. 6102 and the Execution and Bankruptcy Law No. 2004. The membership agreements are published on our website, and we are of the opinion that the content of the agreement substantially mitigates the legal risks which may arise from the central counterparty services.

On the other hand, the internal implementation principles relating to the activities to be carried out by the business units at Takas Istanbul for the CCP services to be provided have also been stipulated by Takas Istanbul Board of Directors with three separate Regulations (Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles, Takas Istanbul Central

Counterparty Regulation on Collateral Management Implementation Principles and Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles).

Moreover, as prepared based on the fourth paragraph of Article 78 of Capital Markets Law No. 6362, the fourth subparagraph (ç) of the first paragraph of Article 7 and the second paragraph of Article 8 of Central Counterparty Department, “Directive on Information, Internal Audit and Internal Control Systems of Takas Istanbul Central Counterparty Members” has been approved by Capital Markets Board as of 10.03.2016. The aim of the Directive is to regulate the procedures and principles regarding the information systems, risk management, internal audit and internal control activities to be established by the members deemed appropriate to receive the central counterparty service so as to manage and control the risks undertaken for their responsibilities to Takas Istanbul.

Thus, a legal regulatory framework which can minimize the uncertainty and the legal risk in the CCP services with respect to both market participants and Takas Istanbul business units has been established.

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

In the secondary arrangements that have been issued based upon the Capital Markets Law No. 6362, the issues relating generally to the central clearing and settlement institutions and specifically to the activities of Takas Istanbul are stipulated in a clear and understandable manner. Takas Istanbul also prepares clear and understandable market directives and procedures for each market to which CCP service is to be provided. The Market Directives are approved at first by the Capital Markets Boards, whereas the Procedures are prepared in accordance with the Directives approved by the Board (hence, controlled in terms of their compliance and consistency with the primary and secondary arrangements by the capital market authority).

1.3. 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.

The secondary arrangements at the level of Law and Regulation are published in the Official Gazette. The directives and procedures that entered into force by Takas Istanbul Board of Directors’ Resolution and the Capital Market Board’s Decision based upon these arrangements are sent separately to the members by a general letter and they are also accessible through Takas Istanbul website all the time. Besides, general letters or explanatory documents explaining the CCP service are also published and the questions received from the members or other concerned parties are answered.

1.4. 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.

As explained in (1.1) above, the critically important central counterparty practices whose principals have been prescribed in the Capital Markets Law No. 6362 and the secondary arrangements issued based upon this Law are incorporated as a right and/or obligation into the agreements executed

separately with each member, and the central counterparty practices included in the legal capital market legislation are turned into a component of a legally enforceable and pursuable contractual relationship.

The finality and irrevocable nature of settlement is a fact that has been made certain at the level of law. Pursuant to Article 79/1 of the Law No. 6362, the clearing and settlement instructions and operations of the capital market instruments and the payment transactions thereof cannot be reversed and revoked, including the situations where the activities of the members of the central clearing and settlement institutions are temporarily or permanently suspended or the liquidation processes are initiated before the administrative and judicial authorities.

1.5. An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.

The disputes arising due to the CCP services of Takas Istanbul are subject to the laws and courts of the Republic of Turkey. Takas Istanbul offers the clearing and settlement and CCP services only in the Turkish capital markets. We have not any member domiciled abroad or any clearing and settlement or CCP service we provide to the platforms located abroad. We work with the depository institutions domiciled abroad in accordance with the custody limits allocated by our Board of Directors, and whether or not the non-cash assets under custody are protected against the legal proceedings of the creditors of the depository institution is particularly investigated.

In Article 7 with heading “Legal Risk” of Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principle, it is also stipulated that Takas Istanbul shall take the necessary actions for the identification and elimination of the legal risks relating to the CCP activities, in particular for the issues such as the protection, usage, segregation and porting of the members’ and customers’ collateral.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 1

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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We are of the opinion that the central counterparty (CCP) service offered by Takas Istanbul has a solid legal basis and the requirements for Principle 1 have been met.

Principle 2: Governance

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.

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. 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.*

Key considerations

2.1. 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.

Takas Istanbul's vision, mission and values are defined through the strategic plans approved by the Board of Directors, and the CPMI-IOSCO Principle 2 is supported in all its aspects. In 2015-2017 Strategic Plan approved by the Board of Directors on 25.02.2015, the vision, mission and values of Takas Istanbul are defined as follows:

Takas Istanbul Vision: *"To be a trustworthy, effective and innovative institution which provides clearing & settlement, banking and central risk management services at global quality standards, as the institution of choice in international markets."*

Takas Istanbul Mission: *“Contribute to the development of markets with its reliable and effective post-trade services.”*

Takas Istanbul Values:

- **Trust:** Adhering to the principle of trustworthiness in Takas Istanbul’s relations with its customers, shareholders, stakeholders and employees; and executing services in a timely and accurate manner according to providence of clear, understandable and correct information within the concept of mutual trust.
- **Stability:** As an important infrastructure institution of capital markets providing efficient clearing & settlement, custody and central counterparty services both in organized and over-the-counter markets, Takas Istanbul contributes to the financial stability in Turkey.
- **Customer Orientation:** Generating solutions contributing to enhance the effectiveness of the financial system in clearing & settlement, custody and other related banking services as well as to the development of markets; developing projects within the framework of current and future needs of customers comprising of intermediary institutions, exchanges and other capital market institutions and working with customers and relevant institutions in a continuous cooperation, solidarity and coordination environment
- **Effectiveness:** Generation of the most appropriate, accurate and cost-effective solutions for Takas Istanbul services within the scope of sector and market needs by capitalizing on professional expertise and corporate memory at the utmost level.
- **Robust Financial Structure:** Keeping the financial assets of Takas Istanbul at the level necessary to encompass the risks undertaken and cover the commitments given to the markets and the settlement members, within the framework of the target to further extend central counterparty service together with effective clearing & settlement and custody services provided to the capital markets.
- **Transparency:** Disclosing the notices and announcements required to be made by Takas Istanbul to the public and the related parties in an accurate and timely manner, acceptance by Takas Istanbul of the responsibilities and accountability requirements as well as being ready and open to public audit.
- **Sustainability:** Mitigating risk with continuous improvement approach and adopting innovative and creative solutions by observing the efficiency of the markets to which the service is rendered.

2.2. 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.

The most general legal arrangement that must be taken into account in the corporate governance of Takas Istanbul incorporates as a joint stock company is the Turkish Commercial Code No. 6102. Along with the general provisions of the Turkish Commercial Code relating to the governance of the joint stock companies, Takas Istanbul is also subject to the Capital Market Law No. 6362 and the supervision of the Capital Markets Board by virtue of holding a central settlement and clearing institution license, and to the Banking Law No. 5411 and the supervision of the Banking Regulation and Supervision Agency (BRSA) by virtue of holding an investment banking license, and to the Law

No. 6493 on Payment and Securities Settlement Systems and the supervision of the Central Bank of the Republic of Turkey by virtue of operating a securities settlement system.

In this context, Takas Istanbul is subject, in its capacity as a bank, to the Regulation on the Corporate Governance Principles dated 1 November 2006 published by the BRSA and also subject, in its capacity as a central clearing and settlement institution, pursuant to Article 36 of the Law No. 6362, to the corporate governance principles stipulated by the Capital Markets Boards based upon Article 17 of the Law No. 6362. Besides these, the Regulation on Corporate Governance Principles which encompasses the content of the corporate governance policy providing guidance for the management of the Bank in a transparent, accountable, responsible and equitable manner, the roles and responsibilities of the Corporate Governance Committee established within the structure of the board of directors, the arrangement of the Bank's relationships with its shareholders, stakeholders, regulatory and supervisory authorities, managers and employees in accordance with the principles of honesty, reliability, impartiality, confidentiality and equality, and the Bank's responsibilities regarding the environment and social life, has been approved by the Board of Directors on 29.04.2013 and entered into force. Thus, Takas Istanbul has a documented, extremely comprehensive alliance of principles compliant with the international standards that it must observe in its corporate governance and its relationships with its stakeholders.

On the other hand, along with the general provisions of the Turkish Commercial Code, the issues that must be adhered in the operation, organization and management of the banks and the central clearing and settlement institutions have also been regulated in a detailed manner by the primary and secondary arrangements (Laws and Regulations).

Along with the laws and regulations, the most important written document outlining the decision-making and management bodies of our bank and their duties, powers and functioning is Takas Istanbul Articles of Association prepared in accordance with the Turkish Commercial Code and other relevant legislation and it is published on our website. The duties, powers and working principles of the Supervision Committee established within the body of the board of directors in accordance with the Banking Law No. 5411 are defined with the "Supervision Committee Regulation" approved by the Board of Directors on 27.09.2012. The duties and responsibilities of Takas Istanbul business units and the hierarchical structure are specified with the Organization and Duties Regulation approved by the Board of Directors on 25.12.2014. Our organizational chart set forth by this Regulation, information about our executive management, annual reports and results and the independent audit reports are available on our website for public access.

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

The duties and responsibilities of the Board of Directors are laid down in Articles 374 and 375 of the Turkish Commercial Code No. 6102 that has entered into force by being published in the Official Gazette dated 14/02/2011 and numbered 27846. Article 374 - (1) states that "The Board of Directors and the management, to the extent delegated to them, shall be authorised to make decision with regard to all business and transactions required to perform the company's scope of activity, excluding

those subject to the authority of the General Assembly by law and the Articles of Association". On the other hand, Article 375 defines the non-delegable duties and powers of the Board of Directors. In addition, pursuant to the capital markets legislation, the duties and powers of the board of directors in the central clearing and settlement institutions are exclusively stipulated in Article 13 of the General Regulation on the Establishment and Operating Principles of Central Clearing and Settlement Institutions.

The roles and responsibilities of the Board of Directors specific to Takas Istanbul are documented in Article 12 of Takas Istanbul Articles of Association. In the Articles of Association, it is stated that the Board of Directors must manage Takas Istanbul in accordance with the Turkish Commercial Code, the Banking Law and other relevant laws and regulations. The duties of the "Supervision Committee", "Corporate Governance Committee" and "Credit Committee" within the body of the Board of Directors are laid down through the regulations. The members of the board of directors are subject to Articles 393, 395 and 396 of the Turkish Commercial Code No. 6102 which stipulate, respectively, the prohibition of participation in discussions regarding conflict of interest, prohibition of conducting transaction with the company and becoming indebted to the company and prohibition on non-compete, as well as to the prohibitions in Article 18 of the General Regulation.

Takas Istanbul Board of Directors is responsible for evaluating the performance of the bank and its management. There is no pay made to the members of the board of directors based on individual performance. Evaluating the performance of the Board of Directors and electing or dismissing the members are the issues under the authority of the General Assembly in accordance with the Turkish Commercial Code (where the regulatory powers given by the public authorities are set aside). The Annual Report depicting the financial position of the Bank is prepared by the independent auditors and conveyed to the shareholders for review before the annual General Assembly meeting. The performance of the Board Members is put to the vote in the General Assembly meeting, and if the Board of Directors is not discharged by the great majority of the shareholders, the Board of Directors shall be held responsible for that situation.

2.4. 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).

The minimum qualifications that Takas Istanbul Board Members must possess are stipulated by the legislation, and it is a legal requisition for the members to meet the necessary education and experience conditions. According to Article 23 of the Turkish Banking Law No. 5411 dated 19/11/2005, it is stated that the conditions referred to in Article 25 and stipulated for the General Manager in the said law shall also be sought for the half plus one of the Board Members. In its Article 12, the General Regulation determines the conditions that the Board Members and the General Manager must possess. As per Takas Istanbul Corporate Governance Regulation approved by the Board of Directors, Takas Istanbul Board of Directors comprise of both executive and non-executive members. Except for the "General Manager", no board member having an executive position in Takas Istanbul holds a seat in the Board of Directors of Takas Istanbul. Pursuant to the Articles of Association and the corporate governance principles, independent board members also serve at the board of directors. Currently, three out of a total of 8 board members except for the General Manager to be the member as of right have been selected as independent members at the General Assembly.

2.5. 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.

The roles and responsibilities of the company management are defined through the Organization and Duties Regulation approved by the Board of Directors on 25.12.2014. Apart from the legal requisitions, the roles and responsibilities of the management are structured in the same line with the targets and objectives of the bank. The Management has to ensure the activities and operations of the bank to be in harmony with the legal requisitions as well as the targets, strategy and risk tolerance appetite levels set by the board of directors. The management is also responsible for ensuring that the activities and operations of the bank are carried out on an environment where the necessary internal controls are in place and applied as required, with the aim of achieving the targets of the bank.

In Takas Istanbul, there are four committees operating under the chair of the General Manager and with the participation of other senior managers: Strategic Coordination Committee, Asset-Liability Management Committee, Information Technologies Committee and Central Counterparty Default Management Committee.

In addition, the special roles and responsibilities assigned exclusively to Takas Istanbul senior management and business units in relation to the central counterparty activities are particularly stipulated with Article 10 of Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles approved by the Board of Directors on 22.07.2015. Accordingly, the General Manager, Assistant General Managers and other senior managers bear the following roles and responsibilities;

- Carrying out the CCP activities in a compatible manner with the targets and strategies set forth by the Board of Directors,
- Establishing the compliance and internal control procedures that would enable the accomplishment of the targeted objectives,
- Taking measures that would ensure other activities of Takas Istanbul not to pose a significant risk for its CCP activities,
- Allocating sufficient resources to the risk management, internal audit, internal control and compliance functions.

Possession by the management of necessary knowledge, experience and integrity is a must that is rigorously emphasized in both the primary and secondary legislation and the internal arrangements. The authority to evaluate the performance of senior management, appoint or dismiss them belongs to the Board of Directors and the General Manager. In the monthly held meetings where Takas Istanbul's operations, activities, ongoing projects and financial position are evaluated based on the targets and strategies of the bank, Takas Istanbul management reports directly to the Board of Directors.

2.6. 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.

Takas Istanbul's corporate risk management framework is established by taking account of the risk management needs that are required by the capital markets legislation, and particularly by the banking legislation being subject to and the central counterparty activities. The central counterparty activities and the validity of the risk management models used in these activities are controlled and audited by the Board of Directors through the Internal Audit, Internal Control and Risk Management teams (internal system units) working in direct report to the Supervision Committee within the body of the Board of Directors and engaging in internal audit, internal control, capital adequacy, risk control and their reporting at the corporate scale.

Besides this, for the management of financial risks assumed by Takas Istanbul is managed by , "Central Counterparty Department" , which is independent from the clearing and settlement operations and market operator units and reporting to related Asistant General Manager. The risk limits and the membership types to be assigned to the CCP members are determined by the "Internal Credit Rating and Assessment System" operated by the "Financial Analysis and Risk Monitoring Team", whereas all types of risk parameters related to the positions and collateral are determined by the "Central Risk Management" and monitored by "Collateral Monitoring and Default Management Team"

Accordingly;

- Risk Management Regulation,
- Regulation on Internal Capital Adequacy Assessment Process and the Procedure on Stress Test Program Policy and Implementation Principles,
- Business Continuity Plan, Emergency Plan and Recovery Plan,
- Credits Regulation,
- Regulation on Credit Ratings and Assessment Systems General Principles and the Procedures on Credit Ratings and Assessment Principles prepared separately for the Banks, BrokerageFirms and Other Financial Institutions in accordance with this regulation,
- Market Directives prepared for the VIOP and SLM to which the CCP service is provided and the Markets Procedures issued based on these procedures,
- Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles,
- Takas Istanbul Central Counterparty Regulation on Collateral Management Implementation Principles,
- Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles,

which have been approved by the Board of Directors of our Bank in accordance with the banking risk management and capital adequacy arrangements prepared by BRSA by observing BASEL standards as well as the standardized international legislation including CPMI-IOSCO and EMIR and the best practices relating to the capital markets, are the basic documents created within the framework of both corporate and central counterparty risk management. All types of major financial and non-financial risks exposed by Takas Istanbul are identified, measured and restricted by the credit, risk,

trade, collateral, custody or concentration limits, the signal values which would trigger the warning mechanism upon approaching to the risk limits are determined and the regulatory and/or internal capital is allocated for the risks, and the decision-making and management mechanism and the measures to be taken in case of physical or financial emergency situations are designated.

Capital allocation for the risks arising from the central counterparty activities are addressed among the Pillar 1 risks (credit risk, market risk, counterparty credit risk and operational risk) and Pillar 2 risks (liquidity risk, interest rate risk arising from banking books, capital allocated for CCP covered risks, CCP general business risk and CCP restructuring risk provision) in accordance with the banking capital adequacy arrangements of BASEL Committee, together with the risks arising from Takas Istanbul's other activities, by observing EMIR Supplementing Regulation (EU) No 152/2013 of the European Union relating to the capital adequacy of the Central Counterparty Institutions.

Regarding IT and operational risk management, Takas Istanbul possesses ISO 27001 (Information Security Management Systems) and ISO 22301 (Business Continuity Management System) certificates.

In summary, the critical issues such as Takas Istanbul's risk-tolerance policy, responsibilities at the risk management and those who carry these responsibilities, functioning of the decision-making mechanism in case of extraordinary situations like emergencies, crises or default management, etc. are covered by the risk management framework at the best level. In Takas Istanbul, both corporate and central counterparty risk management activities are carried out by Central Counterparty Department and Risk Management Team as being non-executive units (meaning not dealing with any income generating activities) whose remuneration is not associated with the Bank's performance and to whom the senior management is obliged to allocate the necessary resource, and the risks arising from the central counterparty activities are analyzed with a holistic approach both through special reports evaluated by the senior management, internal system units, Supervision Committee and the Board of Directors and during the minimum capital adequacy calculations and internal capital adequacy assessment process together with the risks arising out of other activities, and discussed in the Supervision Committee and the Board of Directors.

2.7. 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.

The operating principles and procedures specified in Article 10 of the General Regulation on the Establishment and Operating Principles of Clearing and Settlement Institutions published by the Capital Markets Boards in the Official Gazette dated 30.05.2013 contain all issues that would enable the interests of the market participants to be pursued. The CCP members also exist among the shareholders' of Takas Istanbul and they have been represented at the Board of Directors.

In addition, in order that clearing members and their client could be represented in formation of CCP policy and business rules and tjta their recommnedition could be presented to Board of Directos at Takas Istanbul, "Regulation on Takas Istanbul MKT Risk Advisory Committee on Establishment, Duties and Working Principles" was approved the Board of Directors on 28/07/2016. This committee

allows members and their clients to contribute to the risk management activities conducted on the markets where CCP services are provided and the committee periodically convenes in March and September.

In addition, our efforts towards the establishment of a CCP Risk Advisory Committee to give recommendations to the Board of Directors, where the members and the customers of the members can also be represented, are continuing.

The disclosures to be made to the stakeholders and public are concretely stipulated in Article 40 of Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles. Accordingly, the following information is disclosed to the members and public to ensure transparency in the CCP services provided by Takas Istanbul:

- For the governance arrangements;
 - ✓ Issues relating to the organization and corporate governance,
 - ✓ Financial statements for the latest period,
- For the business rules;
 - ✓ Regulations, directives and procedures,
 - ✓ Information relating to the central clearing and settlement services of the bank,
 - ✓ Principles regarding the risk management, membership and default management,
 - ✓ Assets accepted as collateral and the collateral valuation haircuts,
 - ✓ Monitoring and segregation of collateral and the characteristics of the collateral accounts,
 - ✓ Margin requirements and guarantee fund parameters,
 - ✓ Summary results for the stress tests and the backtesting,
 - ✓ Current CCP members,
 - ✓ The volume of transactions cleared daily,
 - ✓ Average required margin amount in the market,
 - ✓ Clearing commissions and fees,
 - ✓ Technical requirements for the system communication protocols.

For data to be disclosed to the public, protection of commercial privacy is given particular care. In disclosing the results for the stress tests, the member names are not included.

The notifications to be made to the authorities and the disclosures to be made to the members in accordance with the default management are included in Articles 9 and 14/4 of Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 2:

Observed	Broadly Observed	Partly Observed	Not Observed	Not Applicable
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

We are of the opinion that the corporate governance framework at Takas Istanbul pursues the interests of both Takas Istanbul and its stakeholders and the public as well as the financial stability, hence, it observes principle 2.

Principle 3: Framework for the comprehensive management of risks

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

Key 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.*

Key considerations

3.1. 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.

The body responsible at the highest level for the establishment of an efficient risk management function at Takas Istanbul and the supervision and oversight of the sufficiency of this function is the Board of Directors. The arrangements made by the Board of Directors and listed item by item in (2.6) above provide a comprehensive, consistent and robust risk management framework to identify, measure, monitor and manage the risks. The arrangements forming the risk management framework are prepared under the coordination of the Risk Management Team or the Central Counterparty Department, as to their relevance, by obtaining the opinions of the legal consultancy and the business units, and are submitted to the Board of Directors by the General Manager or the Supervision Committee, again as to their relevance. Takas Istanbul's risk management framework is reviewed at least one a year and its up-to-dateness is maintained. The efficiency of the risk management policy, procedures and systems is kept under observation by the Board of Directors by using the internal control and internal audit functions.

The main risks which are defined in Takas Istanbul's banking and central counterparty risk management documents and to which regulatory and/or internal capital is allocated are as follows;

- Credit risk,
- Counterparty credit risk,
- Market risk (including specific risk),
- Liquidity risk,
- Structural interest-rate risk,
- Operational risk (including legal risk),
- CCP covered risks,
- CCP general business risk
- CCP restructuring risk.

Takas Istanbul delicately manages the risks arising from CCP activities at three stages; (i) before assuming the clearing and settlement risks (pre trade), (ii) while assuming the clearing and settlement risks (at trade), and (ii) after assuming the clearing and settlement risks (post trade).

At the first stage;

- the financial strengths of those to be accepted to the CCP membership is measured,
- a risk limit is allocated to the members accepted to the CCP membership, prorata to their financial strengths,
- a written commitment is obtained from the board of directors of the institutions to be accepted to the CCP membership, regarding that they will ensure and perpetuate the adequacy of the information technologies, internal control and risk management systems,
- the amount to be used from Takas Istanbul capital for the counterparty credit risk and market risk that might be exposed in case of default of the members is calculated and allocated as the CCP default management resource,
- internal capital is allocated for the CCP business risk and restructuring risk,
- the types of collateral that can be deposited by the members as margin requirements or guarantee fund contribution amount, the composition limits for the collateral to be deposited (minimum and maximum rates) and the collateral valuation haircuts are determined,
- the initial margin and guarantee fund contribution amounts required to be deposited by the members against the positions (risks) to be taken are calculated by the statistical methods with a high degree of confidence.

At the second stage;

- The risk generated/to be generated by the positions taken/wished to be taken by the members and the collateral requirement are estimated/calculated,
- Whether or not the risks taken/wished to be taken by the members are exceeding/will exceed their limits is checked,
- Whether or not the collateral that will cover the risks taken/wished to be taken and the guarantee fund contribution amount are available/deposited is controlled.

At the third stage;

- The positions and collateral of the members are updated with daily market prices and the variation margin amounts are calculated,
- Margin calls are placed to the holders of loss-making positions and/or the members for whom a collateral obligation arises,
- The compliance of the members with the individual risk and collateral compositions and limits is monitored,
- The market-wise compliance with the liquidity and concentration risk limits is monitored,
- The sufficiency of both the guarantee funds and all default management resources are controlled by the stress tests,
- Whether or not the risk parameters and the collateral valuation haircuts constituting the base for calculation of margin requirements and guarantee fund contribution amounts maintain their validity is controlled through backtesting,
- Takas Istanbul Internal Audit Team conducts on-site audits at the selected CCP members regarding the adequacy of their information technologies, internal control and risk management systems,
- Takas Istanbul Internal Audit and Internal Control Teams review the CCP risk management processes and models,
- Risk Management Team tests the sufficiency of Pillar 1 and Pillar 2 capital allocated for the financial and non-financial risks through stress tests at the corporate scale,
- Cash margin requirements and guarantee fund contribution amounts received from the members are taken into account in Pillar 1 regulatory capital adequacy calculations according to the accounts they held in Takas Istanbul balance sheet.

In fact, risks arising from the interest accrued by Takas Istanbul on margin requirements and guarantee fund contribution amounts deposited by the CCP members to the accounts at Takas Istanbul, their transfer to other banks or maintenance at the depository institutions are managed in an extremely effective manner in accordance with the protection provided in the second paragraph of Article 73 of the Capital Markets Law No. 6362.

Pursuant to Article 73/2 of the Law No. 6362; the collateral held at the clearing and settlement institutions to prevent the clearing and settlement risks and the assets in the guarantee fund established thereof cannot be used other than for their intended purpose; they cannot be seized even for collection of public receivables, cannot be pledged, cannot be included in a bankrupt's estate and they are not affected from the liquidation decisions of the administrative authorities and no precautionary attachment can be imposed on them. Takas Istanbul can, pursuant to the CCP Regulation, accrue interest on cash margin requirements and guarantee fund contribution amounts deposited by CCP members, and the interest income is transferred to the accounts of collateral owners after the deduction of Takas Istanbul commission. In the interest accrual process, either the O/N term deposit accounts opened exclusively at the banks or the GDDS-based reverse repo transactions can be used in accordance with Takas Istanbul Central Counterparty Regulation on Collateral Management Implementation Principles (In case the special deposit accounts are preferred, the accounts are opened by segregating on the member's portfolio and customer basis for each market to which CCP service is provided, and it is admonitory declared in writing to the bank in

which the accounts are opened that the monies being deposited to these accounts are assets protected by Article 73/2 of the Law No. 6362). Thus, the collateral belonging to the CCP members or their customers and delivered to Takas Istanbul by the CCP members are being protected from the bankruptcy or liquidation of both Takas Istanbul and the banks/institutions where the accounts in which Takas Istanbul deposited this collateral are held, as well as from any proceeding of the creditors of both Takas Istanbul and other banks or institutions where the collateral is deposited or safe-kept.

Again pursuant to Article 73/2 of the Law No. 6362, the margin requirements and guarantee fund contribution amounts delivered to Takas Istanbul in the markets to which central counterparty service is provided can only be used to cover the risks and obligations arising from the positions taken by the members or their customers. Article 23 of Takas Istanbul Central Counterparty Regulation on Collateral Management Implementation Principles approved by Takas Istanbul Board of Directors prohibits the use of margin requirements and guarantee fund contribution amounts received for the CCP service to fulfill the obligations resulting from any activity of Takas Istanbul, even for a temporary period, including those arising from other capital market or banking activities of Takas Istanbul; hence, in the management of CCP risks, an extremely strong framework which would also prevent Takas Istanbul's other activities from posing any risk for the CCP activities has been established.

On the other hand, the CCP risks of the members can be monitored and assessed collectively with the risks arising from Takas Istanbul's other activities. For instance, total risk of the CCP members is at first restricted by the limits indicating the total risk threshold that they can assume in all markets in which they operate across Takas Istanbul, and the risk limit allocation for the CCP markets is made by taking account of the upper limits. The upper limits set forth for the banks also restrict the guarantee amount that can be received from these banks. The collective monitoring of all risks (CCP and non-CCP) of the members across Takas Istanbul is conducted by the Financial Analysis Team. The risks of the members at different CCP markets can also be monitored collectively by the Central Counterparty Department.

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

Takas Istanbul has established the necessary infrastructure and made the arrangements thereof to ensure its members to manage and restrict their obligations against Takas Istanbul. The members are able to monitor their obligations against Takas Istanbul, the amounts of their collateral, their open positions and the transitional gain/loss positions of the accounts through the member screens. Warning messages are also sent to these screens, and all information relating to the accounts having an outstanding margin call is additionally provided as a report.

Takas Istanbul shares with the members all information relating to the risk models it uses in the markets to which it provides CCP service and daily publishes the risk parameter files and information being used in margin calculations. The members are able to create hypothetical scenarios through the necessary tools and simulate the collateral requirement. When the CCP members exceed the risk-based limits designated to them, they face with collateral obligations increased up to 100%; hence, they become obliged to closely monitor their risk-limit and collateral positions. Accounts having a collateral deficit are precluded from engaging in risk-enhancing transactions.

Takas Istanbul tries to help individual customers to manage and monitor their risk properly. Currently in VIOP, the individual customers can monitor their position and collateral information held on the accounts at Takas Istanbul by the CCP members through remote access. The studies have been continuing to enable the same functionality for the Securities and Lending Market as soon as possible.

The CCP members have to take all necessary measures in the markets or capital market instruments to which CCP service is provided to ensure continuity of the required internal control, risk management and internal audit mechanisms in order to become a party to the said service. During the admission process to the CCP membership, Takas Istanbul also takes into account the adequacy of the internal systems and technical infrastructure of the member and Takas Istanbul Internal Audit Team can conduct on-site audits at the members. As prepared by Takas Istanbul based on the fourth paragraph of Article 78 of Capital Markets Law No. 6362, the fourth subparagraph (ç) of the first paragraph of Article 7 and the second paragraph of Article 8 of Central Counterparty Department, "Directive on Information, Internal Audit and Internal Control Systems of Takas Istanbul Central Counterparty Members" has been approved by Capital Markets Board as of 10.03.2016. The Directive regulates the procedures and principles regarding the information systems, risk management, internal audit and internal control activities to be established by the members deemed appropriate to receive the central counterparty service so as to manage and control the risks undertaken for their responsibilities to Takas Istanbul.

The contributions made by the members to the guarantee funds established for the markets to which CCP service is provided help raise awareness of the members about the risks in the relevant markets.

3.3. 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.

By virtue of the central counterparty and clearing & settlement activities it performs, Takas Istanbul has interdependencies with other institutions and service providers. Risks that might be exposed due to the interdependencies existing with the service providers such as the Members, Borsa Istanbul, Central Registry (Depository) Agency, Central Bank of the Republic of Turkey and SWIFT as a result of the activities performed are considered important.

The technological interdependence between BİAŞ markets in which trade orders are achieved, Takas Istanbul where clearing & settlement and central counterparty operations are conducted and the Central Registry Agency where the custody takes place is particularly regarded as critical, and for this reason, Borsa Istanbul, Central Registry Agency and Takas Istanbul conduct joint emergency situation tests to enhance the business continuity.

Regarding IT and operational risk management, Takas Istanbul possesses ISO 27001 (Information Security Management Systems) and ISO 22301 (Business Continuity Management System) certificates.

Risks arising from the interdependencies in the lines of trading, clearing & settlement and custody are first addressed within the scope of ISO 22301 business continuity, the potential impacts of the risks are analyzed and the critical processes are identified. In the emergency scenarios routinely

conducted at Takas Istanbul, special importance and place are given to the situations in which the connection with other institutions and service providers are interrupted.

In addition, Takas Istanbul signs service level agreements particularly with the service providers and uses insurance policies to restrict such type of risks.

For the restriction of risks related to the service providers, Takas Istanbul has established all necessary processes in accordance with the banking legislation it is subject to, and it uses qualitative methods to measure the risks and reviews the service provider companies once a year.

Moreover, such risks are also reviewed once a year pursuant to ISO 27001 standard with the information technologies perspective.

By virtue of the banking license it owns, Takas Istanbul has the right to access the liquidity of the Central Bank of the Republic of Turkey; however, the stress tests conducted for the CCP markets with an assumption of concurrent default of the two largest members with the highest exposure indicate that being in need to the liquidity of the Central Bank of the Republic of Turkey is a low possibility even for the greatest defaults to be experienced in the CCP markets (since the margin requirements and guarantee fund contribution amounts are kept in extremely secure accounts with O/N maturities, as explained in (3.1) above).

In case of need, resources allocated or committed from Takas Istanbul capital as default management resources and invested to the GDDS can be liquidated on the same day through the Central Bank of the Republic of Turkey. In addition, bank guarantees are not accepted as collateral in the markets to which CCP service is provided and by this way, the interdependence to the liquidity of the banking sector is mitigated in the markets to which CCP service is provided.

3.4. 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.

Along with the Business Continuity Plan and the Emergency Plan related to the physical risks, Takas Istanbul also has a Recovery Plan related to the financial risks. Among the scenarios addressed in the recovery plan, there are critical incidents such as default of the members or exposing unforeseeable losses, facing with inadequacy of liquidity due to other reasons, etc. The plans are reviewed on an annual basis.

Should the default management resources be used, the principles for replenishing the exhausted portion are stipulated in the CCP legislation, and the CCP members also undertake fulfillment of their unfunded guarantee fund obligations through the membership agreements. Furthermore, the legislation grants to Takas Istanbul the power to use profoundly effective recovery tools like variation margin haircutting, force transfer or termination of the positions, etc. under extreme

conditions, and the said powers of Takas Istanbul are also incorporated into the membership agreements.

Takas Istanbul also sets aside capital for the CCP business risk and recovery & orderly wind-down costs. In 2016, the amount of internal capital set aside for the CCP business risk and restructuring risk provision is approximately 94 million TL.

In the Central Counterparty Default Management Principles Regulation approved by Takas Istanbul Board of Directors, “termination of CCP activities” is particularly stipulated and it is stated that;

- if the CCP service provided by Takas Istanbul is terminated for any reason, the existing positions and collateral shall be ported to another institution that may be commissioned as a central counterparty by the Capital Markets Board in accordance with the legislation or Takas Istanbul shall continue, if deemed appropriate by the Board, its clearing and settlement and collateral management services without acting as a central counterparty,
- in case of occurrence of any condition which would prevent Takas Istanbul from continuing its clearing and settlement or central counterparty services and the positions and collateral cannot be ported to another institution, then the positions and collateral shall be liquidated in accordance with the principles to be determined by the Capital Markets Board.

Thus; the fact that developments for the termination of the CCP activities are required to be directed by the authority seems to be a natural consequence.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 3:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul has a robust risk management framework which enables comprehensive management of all risks exposed by Takas Istanbul.

Principle 4: Credit Risk

An FMI should effectively measure, monitor, and manage its credit exposures 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 default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure to 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 to the CCP in extreme but plausible market conditions.

Key considerations

- 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.*
- 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.*
- 3. [N/A for CCPs]*
- 4. A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). 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 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.*
- 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 OOP'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 OOP's participants increases significantly. A full validation of an OOP's risk-management model should be performed at least annually.

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.

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.

Key considerations

4.1. 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.

For managing the risks to which Takas Istanbul may be exposed by virtue of the CCP service it provides, Takas Istanbul applies the risk management framework that is comprehensively explained in Principle 3 and reviewed at least once a year. Takas Istanbul manages the credit risks that it is exposed to in the CCP service in accordance with the following considerations.

- It is restricted by the risk limits set forth by taking account of the individual creditworthiness of the members.
- An initial margin with 99.5% confidence level and two-day margin period is requested to cover the losses that might be incurred during the period to be elapsed until the liquidation of the positions in case of default of the members.
- Positions and collateral are valued on a daily basis with current market prices and a margin call is placed for the accounts having a collateral deficit.
- Increased collateral obligations are imposed on the members breaching their risk limits, and when the breach reaches to a certain level, the members are precluded from engaging in risk-enhancing transactions.
- The size of the guarantee funds funded by the members are determined with 99.9% confidence level and by taking account of the first member having the largest exposure or the sum of the second and third members having the largest exposure.
- The members also make commitment for their unfunded guarantee fund obligations.
- Takas Istanbul capital can be used in the default management in two separate tranches as being before and after the guarantee funds of non-defaulting members.

- The aggregate amount of default management resources must be able to cover, at minimum, the risk arising from the default of two members having the largest exposure.

As explained again in Principle 3.1, Takas Istanbul has a robust risk management framework which would also enable efficient management of the credit risks that might be exposed in safe-keeping and valuation of margin requirements and guarantee fund contribution amounts deposited by the members and belong to the members or their customers.

All risks of the members at Takas Istanbul are restricted and monitored both individually on the basis of markets and transactions and collectively through credit, risk, trade, collateral and custody limits allocated by the Board of Directors.

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

Takas Istanbul may be exposed to credit risk in the event the institutions which are its members in the CCP services are failed to perform their obligations against Takas Istanbul in a complete or timely manner or the size of depreciation in the values of the assets accepted as collateral is unable to cover the potential loss in case of any default, the institutions in which the margin requirements and guarantee fund contribution amounts additionally delivered to Takas Istanbul are invested or safe-kept fail to perform their repayment obligations against Takas Istanbul.

The member risk limit in VIOP to which we provide CCP service restricts the sum of the initial margin amount required to be deposited which is calculated for two-day margin period through SPAN algorithm with a 99.5% confidence level and the variation margin amount not collected yet, if any. Whereas the SLM risk limit restricts the current market price of the asset being lent and the unpaid variation margin and the commission debts, if any.

The members' risks are updated and monitored by intraday and end-of-day valuation of their positions and collateral with current market prices. The collateral deficits occurred in normal conditions should have been removed on the next business day at the latest through collateral enhancement and/or risk-diminishing methods. The member failing to remove its collateral deficit until the end of the given period cannot conduct any trade even it has available limits and the default management rules are stepped-in. It is possible to prevent risk taking of the member during the period of margin call. In the VIOP to which CCP service is provided, the members are allowed to go one level above the limit designated to them provided that they deposit enhanced collateral. The members are not able to trade in VIOP upon hitting to this level, and in SLM, when the current limit is exhausted, even against advance collateral unless the risk limit has not been increased by the Board of Directors.

The credit risk that might be exposed due to the institutions where the margin requirements and guarantee fund contribution amounts delivered to Takas Istanbul are invested or safe-kept is being monitored within the limits allocated to these institutions again by the Board of Directors. Moreover, with the Article 73/2 of the Law No. 6362, it is aimed to minimize the credit risk that might arise from those operations.

Again in the markets to which CCP service is provided; in order for the non-cash collateral to be safe-kept in the depository institutions domiciled abroad, such collateral should have the necessary legal protection in case of bankruptcy or liquidation of the depository institution or against the claims of the creditors from the depository institution and a limit should have been allocated by the Board of Directors for the depository institution; and for the limit allocation, the depository institution should have received a minimum investment grade rating from the international rating agencies.

4.3. N/A for CCP activity.

4.4. A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). 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 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.

Takas Istanbul undertakes settlement finality of the positions generated in the markets to which central counterparty service is provided and, accordingly, it runs a multi-layered defense mechanism which would step in should the need arise. This mechanism is comprised of the margin requirements received from the members, the funded guarantee fund established by the contributions of the members and the unfunded guarantee fund commitments of the members, plus Takas Istanbul capital that can be used in default management.

In Takas Istanbul CCP model, the safety of both the market and Takas Istanbul is addressed at the highest level. In CCP default management, Takas Istanbul's capital can be used in two separate tranches as allocation and commitment. The use of the portion allocated from Takas Istanbul capital to the CCP default management (SIG-skin in the game) before the guarantee fund contribution amounts of the non-defaulting members is compulsory. On the other hand, the second portion committed from Takas Istanbul capital to the CCP default management shall be used after the funded and unfunded guarantee fund obligations of the non-defaulting members

The default management resources and their sequence for use are shown in Figure 3; and the relevant arrangement is laid down in Article 36 of the CCP Regulation.

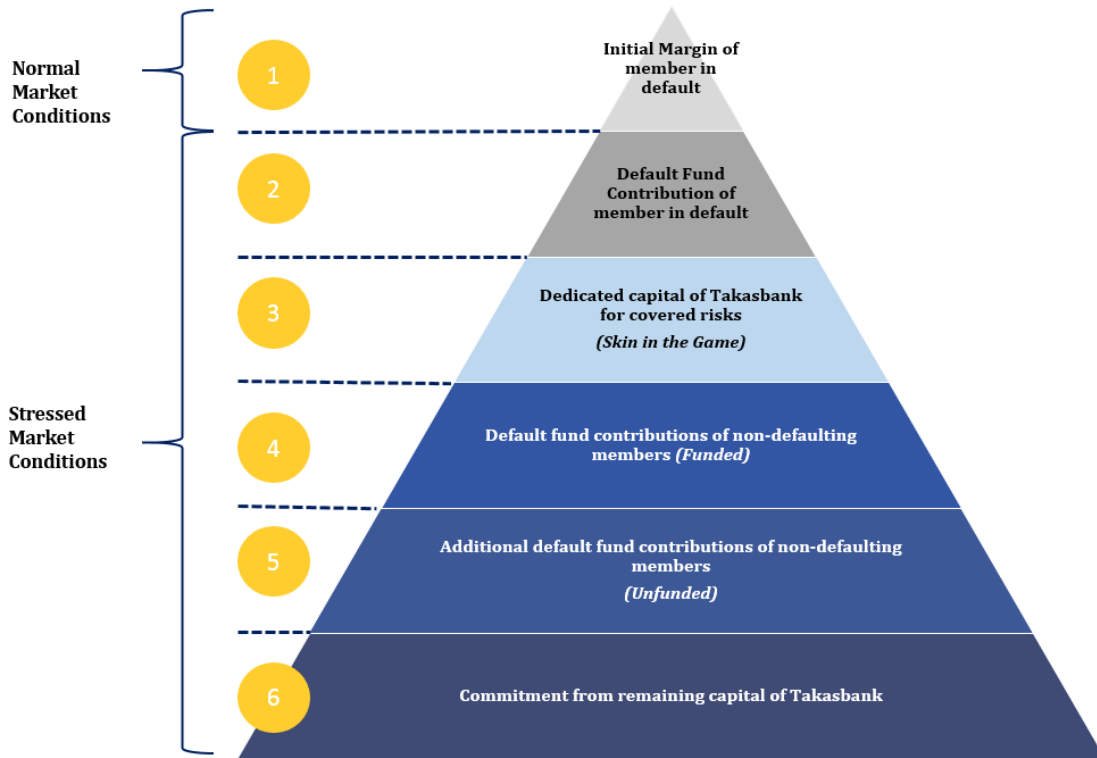


Figure 3- Takas Istanbul Default Management Resources and Order of Use

Calculation of the capital allocated and committed from Takas Istanbul capital to the CCP default management is made in accordance with Basel 2 Capital Adequacy Arrangements and EMIR Master Document (EU) No 648/2012 of the European Union and EMIR technical arrangement (EU) 152/2013 and (EU) 153/2013 on the capital adequacy and default waterfall of central counterparty institutions (please see. Figure 2), and the capital amounts allocated and committed separately by the Board of Directors on the basis of markets to which CCP service is provided and the period in which they will be applicable are disclosed to public.

	Borsa İstanbul A.Ş. Futures and Options Market	Takas İstanbul Securities and Lending Market	Borsa İstanbul A.Ş. Equity Market	Borsa İstanbul A.Ş. Money Market
Instruments	Options and Futures (Index, equity, FX, commodity, energy, precious metals)	A and B group equities traded in Borsa İstanbul A.Ş. and Exchange Traded Funds (ETFs)	Equites, pre- emptive rights, exchange trade funds, warrants, certificates	Lending and borrowing on TL
Number of Clearing members*	73	53	58	32
Daily trading volume (two- sided)*	4,328,378	39,487	5,057,770	-(***)
Daily initial margin requirement*	945,106	96,401	109,604	502,666
Daily deposited margin requirement*	2,580,870	97,471	238,244	821,211
Daily size of funded Guarantee Fund*	146,086	3,696	34,646	5,120
Takasbank's dedicated capital** (thousand TL)	57,425	2,824	13,173	957
Takasbank's committed capital** (thousand TL)	181,543	8,928	41,646	3,024

* As of 30.06.2017
** Valid between 03/04/2017- 31/03/2018 - (thousand TL)
*** No open position in the Market as of 30/06/2017

Table 2- Quantitative indicators for the markets to which CCP service is provided

The use of Takas Istanbul capital in CCP default management is designed in a manner that would enable Takas Istanbul to survive under all circumstances, but also to use its entire capital remaining above the regulatory and internal capital obligations, where necessary. Pursuant to the sixth paragraph of Article 36 of the CCP Regulation, the payments to be made in advance by the stakeholders or other people and institutions as to be used for Takas Istanbul's potential capital increase as well as the equity and quasi-equity resource (subordinated loans etc.) commitments of irrevocable nature can also be added to the capital committed in default management, should the need arise. Hence, Takas Istanbul has created default management resources that can cover much more than the resource requirement that might be faced in case of default of its largest one or two members with highest exposure in extreme market conditions.

The sufficiency of total default management resources is tested through the stress tests regularly conducted on daily, monthly and quarterly periods. Though Takas Istanbul's central counterparty activities is limited to Turkey, the largest two member principle is applied in testing the sufficiency of the default management resources (Article 37 of Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles). The results of the comprehensive stress tests conducted on quarterly periods are reported to the Board of Directors and the Capital Markets Board as a written document.

4.5. 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.

Takas Istanbul conducts stress tests at the daily, monthly and quarterly periods as daily basis for the markets to which it provides central counterparty service, by taking into account many risk factors including exchange rates, stock and bond prices, interest rates, etc., and the sufficiency of the available and potential default management resources is tested under extreme market conditions. Apart from testing whether or not these resources are sufficient in case of default of two members with the highest exposure; whether or not the margin requirements and guarantee fund contribution amounts are sufficient to provide protection against the greater of the risks to be resulted from concurrent default of the member having the largest exposure and the members having the second and third largest exposure is also controlled. In addition, the impact of changes that might occur in the holding periods is also taken into account, and the adequacy of the liquid resources is also measured.

The stress tests for the sufficiency of the total default management resources are conducted on daily and monthly periods, and their results and the measures recommended to be taken, if any, are submitted four times a year (on quarterly periods) to the Supervision Committee and the Board of Directors through the internal system units. The stress test results submitted to the Board of Directors are also reported to the Capital Markets Board. In addition, the test results will also be submitted minimum two times a year to the CCP Risk Advisory Committee.

As per Article 37 of Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles; it is possible to use statistical, historical or hypothetical scenarios in the stress tests, and in practice, a “base-case” historical scenario designated statistically with 99.9% confidence level is supported by two “worst-case” historical scenarios experienced since 2000.

The models used in stress testing and the data, parameters and assumptions used for the development of these models are validated minimum once a year by Takas Istanbul Internal Audit Team. Internal audit findings regarding the validation are submitted to the Board of Directors and the relevant senior managers.

4.6. 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.

In its stress tests conducted to test the sufficiency of the total default management resources, Takas Istanbul uses a base-case historical scenario selected statistically and specific historical event scenarios. In the base-case statistical scenario, the volatility values obtained from the last five-year historical data with a 99.9% confidence level are defined as extreme market conditions and the sufficiency of the default management resources is tested by changing the holding period on market basis. In the historical event scenarios, the highest shift levels occurred in the stock prices and exchange rates are applied to the parameters to be used in the model, by taking the specific volatilities experienced in the past as the base; and the sufficiency of the existing resources in case of default of two members having the largest exposure is measured.

4.7. 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.

The rules and procedures for the members that Takas Istanbul will apply in the management of any individual or combined defaults to be experienced in the markets to which it provides CCP service have been stipulated in the CCP Regulation and the Market Directives and Procedures issued in accordance with this Regulation, whereas the rules and procedures to be used by Takas Istanbul business units have been stipulated in Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles in a comprehensive manner.

As explained in (4.4) above, the credit losses that might be incurred in the CCP activities in case of default of the members shall be covered firstly by the margin requirements and guarantee fund contribution amounts of the defaulting member, and then by the capital allocated by Takas Istanbul, and should this also be failed to be sufficient, by using the funded guarantee fund contribution amounts of the non-defaulting members,

If there is still any uncovered credit losses, the members shall be asked to pay their unfunded guarantee fund contribution amounts, and should these resources also be failed to be sufficient, the uncovered credit losses shall be covered by its capital committed by Takas Istanbul. Again as mentioned in (4.4) above; pursuant to the sixth paragraph of Article 36 of the CCP Regulation, the payments to be made in advance by the stakeholders or other people and institutions as to be used for Takas Istanbul's potential capital increase as well as the equity and quasi-equity resource (subordinated loans etc.) commitments of irrevocable nature can also be added to the capital committed in default management, should the need arise.

With Articles 37 and 44 of the CCP Regulation, Takas Istanbul is equipped with profoundly effective recovery tools like variation margin haircutting, forced transfer or termination of positions, and it also possesses extraordinary tools that enable it to allocate the losses that it fails to cover with normal resources to its members. Thus a structure in which Takas Istanbul can pursue its CCP activities even in the most severe crisis conditions and the order and stability can be ensured in the markets has been designed.

If, in the CCP default management, Takas Istanbul is indebted to the Central Bank of the Republic of Turkey or another liquidity provider, the cash to be generated from the conversion into cash of the non-cash margin requirements and guarantee fund contribution amounts or its allocated or committed capital invested in the GDDSs or from the legal proceeding of the defaulting members shall firstly be subject to the liquidation of the debt being borrowed. This issue is explicitly stipulated in the 5th paragraph of Article 36 of the CCP Regulation.

If the guarantee funds funded by the members have been used in the default management, they are asked to fulfill their additional guarantee fund payment commitment provided it shall not exceed the funded guarantee fund amount on the date of default. The time period allotted to the members to fulfill their additional guarantee fund payment commitment is 5 business days after the request. Additional guarantee fund can be requested from the members at most four times in one year.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 4:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul has the capacity to effectively measure, monitor, and manage its credit exposures resulting from the positions of the CCP members as well as the risks arising from its payment, clearing, and settlement processes. It maintains sufficient financial resources to cover the credit exposure that might be exposed due to each member with a high degree of confidence and also to cover the default of its two CCP members that would potentially cause the largest aggregate credit exposure in extreme but plausible market conditions; and it tests the sufficiency of its financial resources with monthly stress tests conducted on daily, monthly and quarterly basis.

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. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.

Key considerations

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

Key considerations

5.1. An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.

Pursuant to Article 19 of the CCP Regulation, giving priority to the assets with low credit, liquidity and market risk in determining the assets to be accepted as collateral by Takas Istanbul is a legal requirement. In fact, the types of collateral that can be accepted in the markets to which CCP service is provided are listed in the same Article. Accordingly; in the markets and capital market instruments to which Takas Istanbul provides CCP Service, it can accept as collateral; Turkish Lira, Euro and Dollar, Government Domestic Debt Securities, Share Certificates, Guarantee Letters, Investment Fund Participation Certificates, Eurobonds issues by the Republic of Turkey Undersecretariat of Treasury, Rent Certificates issued by the Republic of Turkey Undersecretariat of Treasury and gold in exchange-traded standards. However, Takas Istanbul Board of Directors can narrow down this list on the basis of the markets to which CCP service is provided, and the types of collateral accepted as collateral on market basis are explained in the relevant procedures.

Acceptance of any asset as collateral other than those referred to in the Central Counterparty Regulation can only be possible by the approval of the Board of Directors and the Capital Markets Board. The process to be followed in adding new collateral or ending the eligibility of existing ones has been defined in Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles.

There is not any exceptional practice where the general rules for the accepted collateral are not applied.

All collateral-related parameters have been defined to Takas Istanbul system, and there exist no manually operated process. Hence; it is not system-wise possible to deposit any ineligible asset as collateral. Besides, assets exceeding the composition limits are not made subject to valuation.

Collateral composition limits are set by taking account of the liquidity, credit and concentration risks and the risk profile of the relevant market. Measures taken to limit the liquidity, market and concentration risks of the collateral accepted in the markets to which central counterparty service is provided are included in the Takas Istanbul Central Counterparty Regulation on Collateral Management Implementation Principles. For example; if the debt securities are wished to be posted as collateral (private sector bonds are not listed among eligible collateral in the CCP Regulation), the average repricing-based Macaulay duration of the created portfolio should not exceed 2 years on a member basis, and the sum of the capital markets instruments issued and guarantees given by the same issuer, except Republic of Turkey Undersecretariat of Treasury, should not be more than 25% of the total outstanding collateral in the relevant market.

In Takas Istanbul Central Counterparty Regulation on Collateral Management Implementation Principles, specific wrong-way risk is defined as the risk that may result from the presence of a wrong-way correlation between the market value of the received collateral and the current value of the risk being exposed. Attention is given to not receive the assets as collateral whose value may fall due to the increase of the specific risk carried by the member. It is clearly stated in related market procedures that members can not pledge any security issued by themselves and/or issued by other company/bank belonging to the same capital group of the member or their guarantees as a collateral for Takas Istanbul (excluding guarantees and securities of other banks belonging to Undersecretariat of Treasury with the majority of the securities and capital issued by the Undersecretariat of Treasury)

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

The collateral accepted by Takas Istanbul as collateral in the markets to which it provides CCP service is made subject to at least daily valuation by Takas Istanbul. In addition to the latest traded or weighted average prices, the values determined as benchmark by the Central Bank of the Republic of Turkey or Borsa Istanbul are used in the collateral valuation. In case no trading occurs in the market, the average of the buy and sell prices prevailing in the market at the moment of valuation are used as the price. Prices to be used in the valuation of assets accepted as collateral and their order of priority are specified in the market procedures. Collateral valuation rules are detailed in the market directives and procedures of the markets where CCP service is offered. In addition, the preparation of the technical information documents to be used in the calculation of the theoretical prices has been completed and the subject document has been published in Takas Istanbul corporate website.

Risks to be taken into account in calculating the collateral valuation haircuts to be applied to the assets accepted by Takas Istanbul, principles to be observed in calculating the valuation haircuts, the features of the historical data sets to be used, in-sample and out-of-sample data-based calibration of the valuation haircuts and execution methods and time periods of the backtesting have been

stipulated in the Takas Istanbul Central Counterparty Regulation on Collateral Management Implementation Principles. The collateral valuation haircuts are announced to the public in the relevant legislation.

In determining the valuation haircuts, the credit or specific risks of the relevant assets, their maturities, the volatility they demonstrate in extreme market conditions and the liquidity and currency risks they carry are taken into account. In calculations, the historical simulation-based value-at-risk approach, 2-business days holding period, 99.9% confidence level and minimum 5-years data set are used. In creating the data set, reflecting financial volatilities experienced in the recent period to the calculations is given particular attention to reduce procyclicality and facilitate prudent calculation of the collateral values.

The collateral valuation haircuts are calibrated before their use by applying in-sample backtesting. If, in the last one year period, the relative value changes being calculated by using the assets accepted as collateral, the collateral valuation haircuts and the holding periods exceed the discount factor by more than two business days, the valuation haircuts are calibrated by the multiplication factors. In case of any excess hit by more than 5 business days, the dataset, confidence level and model being used are reviewed.

In the same vein, the haircuts used in the collateral valuation are validated on a monthly basis by being made subject to backtesting using out-of-sample data. If there is more than two hits on average at an asset group in the last one year period and the valuation haircuts have not been made subject to any calibration before, these haircuts are calibrated by the multiplication factors; and if they have been previously calibrated, they are recalculated.

The thresholds for the market price volatilities which definitely necessitate review of the collateral valuation haircuts have been set forth in the Takas Istanbul Central Counterparty Regulation on Collateral Management Implementation Principles.

5.3. 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.

As explained in detail in (5.2) above; in the determination of the valuation haircuts, minimum 5-years data set and 99.9% confidence level are used to take into account the volatility recorded in extreme market conditions in the collateral value, reduce procyclicality and set a prudent and stable level. Particular attention is given to ensure the data set to cover the extreme volatilities experienced in the recent period.

5.4. 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.

In the markets where CCP service is provided, a collateral management mechanism based on continuous-review of the credit, concentration and wrong-way risks is operated to ensure the received collateral to provide protection for the risks assumed by virtue of the conducted transactions, against any event of default throughout the time period that such risks are carried.

Concentration of assets in the collateral pools is monitored on the basis of those issuing or warranting the financial instruments subject to collateral as well as according to asset types that can be eligible collateral. In order to avoid concentration in certain asset categories and on an instrument basis, there are composition limits controlling the ratio of non-cash collateral in total collateral in each market. Besides this, for the some markets to which central counterparty service is provided, a certain rate of the total mark-to market collateral must be kept in the collateral accounts as minimum cash. The rate is 50% for Borsa Istanbul Futures and Options Markets and %30 for Takas Istanbul Securities Lending Market and 10% for Borsa Istanbul Equity Market. Private sector debt securities are not accepted as collateral, and the stocks with the highest liquidity (BIST 100) are accepted as collateral in the CCP markets. In addition to the conservative valuation haircuts to restrict losses that may be incurred from price volatilities under stressed market conditions in liquidation of the government debt securities, the principle where the average repricing-based Macaulay duration of the created portfolio does not exceed 2 years on a customer basis is adopted. On the other hand, the sum of the capital markets instruments issued and guarantees given by the same issuer, except Undersecretariat of Treasury, should not be more than 25% of the total outstanding collateral in the relevant market. The concentration limits are determined by taking account of the best international practices on CCP applications as well as the country and market conditions, and they are reviewed at least once a year.

5.5. 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.

Takas Istanbul does not accept any security for the CCP risks classified as cross-border collateral. Meanwhile, in order for the non-cash collateral received for the CCP risks to be safe-kept in the cross-border depository institutions, such collateral should have the necessary legal protection in case of bankruptcy or liquidation of the depository institution or against the claims of the creditors from the depository institution.

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

The collateral management system managed by Takas Istanbul in the markets to which it offers central counterparty service operates in an integrated manner with the markets as a whole through the asset types it accepts at a broad-spectrum, accurate and timely update of the margin requirements, collateral valuation methodology it conducts during and at end of each day and the rules it imposed to minimize the risks that may be faced.

Pursuant to the third paragraph of Article 79 of the Capital Markets Law No. 6362; the rights and powers of the central settlement and clearing institution on the values of assets it has received as collateral due to the transactions it performs as a clearing & settlement and central counterparty institution cannot be limited in any way. Devoting time for composition to the member institution or the collateral provider, approval of its composition, composition after bankruptcy or entering into composition process by abandoning its assets, restructuring by an arrangement, its bankruptcy, postponement of its bankruptcy, or the proceeding procedures under the Execution and Bankruptcy Law No. 2004 or the relevant provisions of this Law regarding gradual liquidation can under no circumstances limit the relevant central clearing and settlement institution to use its rights and powers on such collateral. Thus; all types of legal risk that may arise in relation to Takas Istanbul's

right of disposition on the collateral delivered by the member in case of default of the member are aimed to be prevented at the law level.

In addition to these; pursuant to second paragraph of Article 73 of the same Law; collateral held at the clearing and settlement institutions to prevent clearing and settlement risks and the assets in the guarantee fund established thereof cannot be used other than for their intended purpose. Although there is no explicit arrangement for the re-use of collateral in the Law, it is regarded that there is no legal problem for Takas Istanbul to borrow, i.e., from the CBRT in the CCP default management, by putting up as collateral the securities it has taken over with the agreements stipulating the transfer of ownership. However, it is not possible to use the received collateral for purposes not related to the CCP default management; and in fact, as mentioned in (3.1.) above; Article 23 of Takas Istanbul Central Counterparty Regulation on Collateral Management Implementation Principles approved by Takas Istanbul Board of Directors prohibits the use of margin requirements and guarantee fund contribution amounts received for the CCP service to fulfill the obligations resulting from any activity of Takas Istanbul, even for a temporary period, including those arising from other capital market or banking activities of Takas Istanbul. Collateral deposited in cash to Takas Istanbul is placed for interest accrual purposes in accordance with the CCP Regulation with O/N maturities to the banks whose credit default risk and risk of loss are regarded as close to zero; however, the counterparty risk in these transactions have essentially been eliminated by Article 73/2 of the Law No. 6362.

The collateral management system has the flexibility that operationally allows determination of new limits, acceptance of different types of collateral and modification of applied risk parameters, wherenecessary.

At Takas Istanbul, the management of the collateral accepted in the markets to which CCP service is provided in accordance with the relevant legislation and the risk limits and parameters are closely monitored by the Collateral Monitoring and Default Management Team established within the body of the CCP Department. The said Team is also responsible for the CCP Default Management and it has rules and procedures for the management of collateral under stress.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 5:

Observed <input type="checkbox"/>	Broadly Observed <input checked="" type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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For the CCP risks, Takas Istanbul accepts collateral with low credit, liquidity, and market risks, and it has determined steady collateral valuation haircuts calculated with a high degree of confidence as well as concentration limits taking account of the best practices.

Principle 6: Margin

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

Key Considerations

- 1. A CCP should have a margin system that establishes margin 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 margin 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 margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default. Initial margin 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 margin at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a CCP that calculates margin at more-granular levels, such as at the sub portfolio 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 margin at least daily to limit the build-up of current exposures. A CCP should have the authority and operational capacity to make intraday margin calls and payments, both scheduled and unscheduled, to participants.*
- 5. In calculating margin requirements, a CCP may allow offsets or reductions in required margin 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 authorized to offer cross-margining, they must have appropriate safeguards and harmonized overall risk-management systems.*
- 6. A CCP should analyse and monitor its model performance and overall margin 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 margin 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.*

Key considerations

6.1. A central counterparty should have a margin system that establishes margin levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.

Takas Istanbul applies a margin system that has been customized by taking account of the risks and specific attributes of the markets and capital market instruments to which it offers central counterparty service. This system bears basic attributes such as accurate and timely risk-based margin calculation at the product, portfolio and market, continuous comparison of the risks with the outstanding marked-to-market collateral and making intra-day and end-of-day margin calls for the accounts having a collateral deficit.

Margin is requested from the members to cover the risks arising from the positions taken on their name or their clients' name. In determining the margin requirements, factors such as volatilities in the prices, price correlations existing between the products, market liquidity, etc. and product-specific features are taken into consideration.

The margin requirement requested from the members is comprised of the initial margin requested against the potential risks to be posed by the positions in case of any default to be occurred in future and the variation margins arising from the update of the position prices.

In the determination of initial margins, the BISTECH Margin methodology as a portfolio-based risk measurement is employed in Borsa Istanbul Futures and Options Market and Borsa Istanbul Equity Market; whereas, historical simulation-based value-at-risk approach is employed in the Securities Lending Market and Borsa İstanbul Money Market.

The margin methodologies employed in these markets are included in the Market Directives and Procedures where the market-specific rules and processes are explained pursuant to the provisions of the CCP Regulation. The members are able to simulate and test their minimum margin requirements calculated by Takas Istanbul in accordance with the principles set forth in the relevant Market Directives and Procedures along with published guidelines by using the historical simulation-based value-at-risk approach in the Securities Lending Market and the BISTECH Margin algorithm in the Borsa Istanbul Futures and Options Market and Borsa Istanbul Equity Market.

Takas Istanbul monitors, throughout the day, the margin amounts it has requested from the members due to the positions they have taken, and it has the authority to make intra-day and end-of-day margin calls if the marked-to-market value of the outstanding collateral falls below the risk level. Takas Istanbul system enables to conduct margin calls at any time interval within the day outside of the hours prescribed in the relevant market procedures.

If the member fails to fulfill its margin call made on a daily basis in ordinary flow within the time period prescribed in the Market Procedures (for Borsa Istanbul Futures and Options Market, Borsa Istanbul Equity Market and Borsa İstanbul Money Market, until 15:00 on the next business day; for SLM, until 17:15 on the same business day), this situation shall be regarded as a "pre-default" and an extra time set forth in the Market Procedures can be allotted to the member to fulfill its obligation thereof. Should the obligation be failed to be fulfilled within this time period, Takas Istanbul "CCP Default Management Committee" may end the event of pre-default and decide to run the default management process. During the pre-default period, the member is prevented from withdrawing cash or securities from its collateral accounts or taking any risk-enhancing position.

All time periods allotted to the members in the Clearing & Settlement and CCP legislation are in “Turkey Time”.

6.2. A central counterparty should have a reliable source of timely price data for its margin system. A central counterparty should also have procedures and sound valuation models for addressing circumstances in which pricing data are not readily available or reliable.

Takas Istanbul obtains the price data it uses in the margin management system that it operates for the markets to which it provides central counterparty service from the corporate sources such as Borsa Istanbul and the CBRT, etc. as well as from the international data suppliers such as Bloomberg, Reuters and Forex, etc. The consistency and accuracy of the price data feeding the system automatically or used in the off-system parameter calculations are controlled and it is possible to modify the price data, where necessary.

The positions taken by the members and the collateral they have placed for these positions are valued by the intra-day and end-of-day market prices, and the margin-collateral balance is monitored on a near real-time basis.

If it is determined that the prices on options contracts traded in the VIOP are failed to be formed in a reliable manner for reasons such as liquidity tightness and bid-ask imbalance in the market, etc., the end-of-day settlement prices can be revised; and the principles regarding the revision have been stipulated in the Borsa İstanbul regulations.

Prices to be used in the valuation of assets accepted as collateral and their order of priority are specified in the Market Procedures. Unless an alternative valuation method is stipulated for the financial assets which have neither an established price under the valuation principles set forth in the procedures nor any theoretical price or whose theoretical price is considered to show significant deviation, the values to be determined by the Central Counterparty Department or the previous end-of-day prices are used. Theoretical prices or the prices of the previous day can be entered into system in accordance with the four eyes control.

The models to be employed in the calculation of theoretical prices are subject to the same principles with other risk models. The Internal Audit Team reporting to Takas Istanbul Board of Directors is in charge of examining the validity of the risk management and collateral valuation models and techniques.

6.3. A central counterparty should adopt initial margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default. Initial margin 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 margin at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a central counterparty that calculates margin at more-granular levels, such as at the sub portfolio 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.

In the margin calculations, Takas Istanbul seeks to calculate the risks that the members carry in the interval in which the positions taken by them are open in an accurate and timely manner and manage the margin-collateral balance in an efficient manner. In order to provide the initial margins to reflect the risk in true manner, the confidence levels and the holding periods to be used in the parameter calculations and the length of the data set to be applied are determined by analyzing certain conditions. Besides that; making the initial margin calculations with minimum 99% confidence level, for a holding period of 2 business days and based on 12 months historical data are made compulsory in Article 18 of Takas Istanbul CCP Regulation and the minimum conditions have been defined.

In determining the parameters; the risk characteristics such as the complexity of assets traded in the markets and the uncertainties in their pricing, the volatility, durations, liquidity, non-linear price characteristics, specific wrong-way risk, etc. and to what extent other risk controls restrict the credit risks, the level of difficulty in closing out the positions or the concentration level of the trades in the market on several members are taken into account.

In this context, the margin requirements in Borsa Istanbul Futures and Options Market are calculated with 99.5% confidence level. In determining the parameters to be used in margin calculations, minimum 2 business days holding period is used. Likewise, at Borsa Istanbul Equity Market, the confidence level is kept at 99.50% to determine statistical parameters determined for the initial margin requirement, and the holding period is used as 2 days for the new transactions, and the holding period for the transactions executed before the margin calculation date is adjusted respectively. Holding period of 1 day is applied for margin calculations of positions that will be expected to settle on the same day. To reduce the procyclicality of data set, a minimum of past 12-month is covered in a manner to include the financial volatilities experienced in the recent period.

In Borsa Istanbul Futures and Options Market and Borsa İstanbul Equity Market, BISTECH Margin methodology is used for the initial margin calculations. In this methodology, the contracts associated with the same commodity group are analyzed together in margin requirement calculation. Accordingly, the underlying assets with identical price movements are evaluated in the same product group; and in case of identification of any correlation across the product groups in financial and economic terms, parameters that would decrease the margin requirement are created. By using a 1250-day data set, the correlations identify the relation of 60-day price changes of the underlying assets. By applying the calculated parameters, the maximum possible theoretical loss resulting from the calculation of risk arrays over the different price and volatility change scenarios for each contract is obtained, and the sum of maximum likely theoretical loss of the contracts associated with the same product group in the portfolio indicates the market risk called as the “Scan Risk”. Besides; Intra-Commodity Spread Charge is calculated for equities in the same commodity group but at different settlement dates. Since the price movements among the maturities may vary, the “Intra-Commodity Spread Charge” is measured to minimize the price risk that the portfolio exposes. Finally, in the calculation of initial margin the offsetting effect applied for shares in the same product group could

be a limited. This limitation is calculated by multiplying the offsetting parameter determined by Takas Istanbul for the difference between the gross margin amount to be obtained as a result of offsetting of all positions in an account and margin amount to be obtained by offsetting (net). In summary, the initial margin at Equity Market is calculated as follows: Scan Risk +Intra Commodity Group Risk - Inter-Commodity Spread Charge Reduction + Offsetting Effect.

On the other hand, the initial margin in the Securities Lending Market is applied for the borrower as 115% for BIST30 equities and 120% for the equities other than BIST30 as the ratio of the market value of the asset subject to the lending. The initial margin rate is determined by taking account of the volatility of the group or index to which the asset and/or assets subject to the lending belong(s) calculated with a minimum 99% confidence level for two days holding period. The confidence level is actually applied as 99.5%.

At Borsa Istanbul Money Market, the margin requirement is charged for any compensation of the counter party for the period starting from value date of the transaction or maturity date when related party defaulted until the default event is settled. The initial margin is calculated by Takas Istanbul using a minimum of 1 year data set and a 99.50% confidence level, and is monitored quarterly, taking into account market conditions.

According to the Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles, the parameters for the products in which there is inadequate or no historical data can be determined by analyzing product data with similar qualifications in accordance with the principle of prudence; and the parameters can be defined above the values inherent in historical data by taking account of the current and future market conditions.

As per the Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles; the liquidation strategy to be implemented in the default management shall be determined by the CCP Default Management Committee consisting of General Manager and relevant managers. However, the CCP Department shall submit the prioritization that it will make for the positions required to be closed by taking account of the liquidity risk and similar issues to the Committee.

In the Regulations on CCP Risk and Collateral Management Implementation Principles, specific wrong-way risk is defined as the risk that may result from the presence of a wrong-way correlation between the market value of the received collateral and the current value of the risk being exposed. Attention is given to not to receive the assets as collateral whose value may fall due to the increase of the specific risk carried by the member.

The margin requirements are determined with margins that will decrease the procyclicality and increase the stability, and the need to raise the margin requirements under adverse market conditions is minimized. The measures that can be taken to decrease the procyclicality in the margin calculations are specified in the Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles. Accordingly, it is possible to adopt one or several of the following measures;

- Setting maximum and minimum confidence levels, provided that they stay within the limits prescribed by the market directives and procedures, when the initial margin risk parameters are defined amount-wise,
- Defining the minimum initial level parameters provided that they are not less than those estimated by a lookback period of 10-year dataset,
- In the prices used for the calculations, applying at least 25% weight to those having extreme values,
- Increasing the collateral amounts or ratios with a multiplier coefficient not exceeding 1.5.

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

One of the key aspects of the margin system employed by Takas Istanbul in the markets to which central counterparty service is provided is the variation margin requested to minimize the risks that the positions may be exposed due to the price changes in the interval in which they are outstanding. In variation margin calculations, the existing positions are marked-to-market by intraday and end-of-day current prices, and the scheduled margin calls are made on a daily basis.

In the event the rate of the marked-to-market collateral to the market value falls below the value set forth in the relevant market procedures and directives and when it is deemed necessary, Takas Istanbul has the authority and the capacity to make unscheduled intraday margin calls.

6.5. In calculating margin requirements, a central counterparty may allow offsets or reductions in required margin 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 central counterparties are authorized to offer cross-margining, they must have appropriate safeguards and harmonized overall risk-management systems.

In Borsa Istanbul Futures and Options Market, the margin requirement is calculated on portfolio basis, using portfolio-based BISTECH Margin methodology, by way of grouping the products associated with the same underlying asset and taking account of the meaningful and reliable correlation effects as well as by allowing offsets across the positions in opposite direction. In case of identification of a meaningful correlation across the product groups in financial and economic terms, parameters by adopting at least 5-year data set, the margin requirement is reduced to a certain level, and specific margin requirements can be calculated for the offsets among different maturities.

Parameters increasing or decreasing the margin requirement used in the portfolio-based collateralization are subject to the same principles with other risk models. The Internal Audit Team reporting to Takas Istanbul Board of Directors is in charge of examining the validity of the risk management and collateral valuation models and techniques.

In the Securities Lending Market, no portfolio-based margin system exists.

It is not worked interoperable with another CCP institution. However, the general principles for working interoperable with other CCP institutions are set forth in Article 38 of the CCP Regulation, and for interoperability, permission must be obtained from the Capital Markets Board.

6.6. A central counterparty should analyse and monitor its model performance and overall margin coverage by conducting rigorous daily backtesting – and at least monthly, and more-frequent where appropriate, sensitivity analysis. A central counterparty should regularly conduct an assessment of the theoretical and empirical properties of its margin model for all products it clears. In conducting sensitivity analysis of the model’s coverage, a central counterparty 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.

The models employed for initial margin and guarantee fund calculations in the markets to which central counterparty service is provided and the data, parameters and confidence levels used for developing the models are reviewed through the tests conducted in a periodic manner. In case any deficiency is detected thereof, the data, confidence level and model being used are examined, and they are modified if deemed necessary.

The adequacy of the models and confidence levels used in initial margin calculations are tested on a daily basis through backtesting. In the backtesting, whether or not the size of the initial margin requested for the positions is able to cover the changes that might occur in the value of the positions during the holding period is checked. The number of observations in which the initial margins exceed the outstanding margin requirement is expected to be less than the number of hits (5 per thousand) inherent in 99.5% confidence level. Otherwise, the parameters and confidence levels used in the initial margin calculations are reviewed. In the backtesting of the collateral valuation haircuts, the number of hits (1 per thousand) inherent in 99.9% confidence level should not be exceeded. The results of the backtesting and the recommended measures are submitted four times a year to the Board of Directors through the internal system units.

In addition, pursuant to the Regulations on CCP Risk and Collateral Management Implementation Principles; if, at the markets, any overnight price change occurs in either one of the following variables at a rate exceeding;

- 10% of BIST 30 and/or BIST 100 index(es),
- 300 basis points of Benchmark GDDS interest rate,
- 5% of the market price of the currency basket comprising of 1 United States Dollar (USD) and 1 European Currency Unit (EUR),
- 200 basis points of 10-years Eurobond interest rate,
- 10% of TL gold price per gram,

then, both the initial margin parameters and the collateral valuation haircuts are recalculated, and they are revised, if deemed necessary.

In addition, whether or not the default management resources consisting of initial margins and other financial resources are at a size capable of protecting against the potential loss that may arise due to

the default of two members having the largest exposure is analyzed in the stress tests. In the based-case scenario used in the stress tests, the volatilities selected separately with a 99.9% confidence level from a minimum 5-year historical data for each risk factor are assumed to be occurred simultaneously, without taking account of the correlations among them, and the base-case scenario is supported by two different historical-event scenarios. In addition, sensitivity tests are also conducted to test the effects on the initial margins of any unit-wise change in the parameters and confidence levels used in the margin models. Stress tests and sensitivity analysis are conducted on daily and monthly periods as “daily basis”, and the comprehensive results obtained in quarterly periods are reported to the Board of Directors through the internal system units, and afterwards, to the Capital Markets Board. In case of occurrence of any resource deficit in the stress tests, the solutions for removing this deficit shall be required to be put forth, and if the insufficiency results from the margin system, the corrective actions should be taken.

Summary for the results of the stress tests and the sensitivity analysis is disclosed to the members and the public.

6.7. A central counterparty should regularly review and validate its margin system.

The risk management models employed by the Central Counterparty Department and the validation of tests conducted for the liquidity risk management are reviewed at least once a year by Takas Istanbul Internal Audit Team.

Criteria used in validation according to the Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles are determined by the Internal Audit Team conducting the validation; however, the following issues must be addressed at minimum during the validation to be conducted.

- Evaluating the conceptual soundness of the models and methods being used.
- Evaluating the risk monitoring activities including validation of the processes.
- Analyzing the data, parameters and assumptions used for the development of the models.
- Evaluating the adequacy and appropriateness of the models used by taking account of the products included in the risk calculations.
- Evaluating the scenarios used in the stress tests, analyzing the reverse-stress tests.

Findings detected by the Internal Audit Team are submitted to the relevant senior managers and the Board of Directors.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 6:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul collateralizes the risks which may arise from the settlement positions of the CCP members, through a risk-based margin system that it regularly tests its accuracy.

Principle 7: Liquidity Risk

An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient 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.

Key considerations

- 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.*
- 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.*
- 3. [N/A for CCPs]*
- 4. A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin 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.*
- 5. 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.*
- 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.*
- 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.

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

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.

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.

Key considerations

7.1. 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.

Takas Istanbul's liquidity risk management framework consists of the banking and capital markets legislation and the arrangements made by the Board of Directors. In Article 42 of Takas Istanbul CCP Regulation, the liquidity risk has also been stipulated in an exclusive manner. Along with this, by virtue of the fact that Takas Istanbul owns a banking license, it is subject to all liquidity arrangements and ratios imposed by the BRSA, and the liquidity risk is particularly addressed during the internal capital adequacy assessment process (ICAAP); and internal capital is allocated for the worst-case scenarios like disposing the financial assets below their normal prices under extraordinary stressed conditions or obtaining liquidity with costs above the ordinary funding costs. Liquidity risk limits have been set by the Board of Directors for Takas Istanbul as well as for the markets to which CCP service is provided, and a warning mechanism which would run when the designated limits approach to or fall from the critical signal values has been created.

In Takas Istanbul's CCP activities, there are five main reasons which may cause being exposed to liquidity risk if it is failed to be managed in a sound manner:

- Margin requirement and guarantee fund contribution amounts deposited by the members are insufficient and/or not being liquid enough,
- Resources allocated by Takas Istanbul to the default management are not liquid enough,
- Failing to invest the CCP collateral by Takas Istanbul in a liquid and safe manner,
- Using the liquidity of CCP default management for non-CCP obligations of Takas Istanbul,
- Takas Istanbul's lack of access to the liquidity of the Central Bank of the Republic of Turkey and/or commercial banks.

Takas Istanbul's risk management framework has been designed in a manner to effectively eliminate the liquidity risk that may arise from these five reasons.

Firstly; the rule which stipulates the sum of liquid collateral of two members having the largest exposure for each market to which central counterparty service is provided, the assets with high-level of liquidity in the guarantee fund established for the relevant market and the amounts allocated and committed by Takas Istanbul from its own capital and invested in liquid assets to not to stay below the settlement risk amount of the said two members calculated with a minimum 99.5% confidence level is applied and monitored on a daily basis. In this monitoring, only the qualifying assets (cash and O/N placements and assets accepted as collateral by the CBRT) are included in the liquid asset definition.

In the two-largest member with the highest exposure rule applied in daily liquidity monitoring, the settlement risks are calculated with a minimum 99.5% confidence level; however, in the stress tests conducted with a minimum 99.9% confidence level, the principle which stipulates the settlement risk of the member causing the highest payment obligation to be covered by the qualifying resources (on-demand or O/N cash placements and assets accepted as collateral by the CBRT) belonging to the CCP default management is also applied pursuant to CPMI-IOSCO Principle 7.4.

Settlement transactions are conducted in the national currency and accordingly, minimum cash collateral maintenance ratios are imposed for each market. In addition, obtaining sufficient amounts of collateral is ensured by way of applying collateral valuation haircuts to the assets eligible as collateral according to their cash conversion potential. In this context, 99.9% confidence level and 2-business day liquidation period are used when calculating the collateral valuation haircuts, and it is possible to differentiate the liquidity period on an asset basis, if deemed necessary.

The requirement to invest the capital allocated from Takas Istanbul capital to the CCP default management into the liquid assets is stipulated in Article 39 of the CCP Regulation.

On the other hand, as explained in principles 3 and 4; it is not possible to use, even for a temporary period, the cash and non-cash margin requirements and guarantee fund contribution amounts accepted from the members in the CCP markets to fulfill the obligations arising from other capital market or banking activities of Takas Istanbul, and the cash collateral is accrued interest with O/N maturities in the special accounts protected by Article 73/2 of the Law No. 6362 and opened at the banks whose credit default risk and risk of loss is regarded as close to zero.

In addition; by considering that Takas Istanbul has an ability to borrow from both the CBRT and the commercial banks, it can be easily understood that the CCP activities are carried out in an extremely robust framework with respect to the liquidity risk.

7.2. 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.

By virtue of the banking license it has obtained in 1995, Takas Istanbul has a strong fund management organization and infrastructure which it has developed overtime.

Within the scope of the liquidity risk management, Takas Istanbul is able to continuously monitor the settlement transactions and fund flows on a currency, member and account breakdown basis through in-house-developed software; and the members are also able to monitor their fund flows over their screens. Besides; online banking tools and SWIFT confirmations can be used for the monitoring activities of these flows.

7.3. N/A for CCP activity.

7.4. A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin 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.

Takas Istanbul's CCP activities are limited to Turkey; and in order to prevent occurrence of cash tightness in the fulfillment of settlement commitments, a series of very comprehensive measures has been taken in the liquidity risk management, as indicated in (7.1) above. In this context, firstly the rule which stipulates the sum of liquid collateral of two members having the largest exposure for each market to which central counterparty service is provided, the assets with high-level of liquidity in the guarantee fund established for the relevant market and the amounts allocated and committed by Takas Istanbul from its own capital and invested in liquid assets to not to stay below the settlement risk amount of the said two members calculated with a minimum 99.5% confidence level is applied and monitored on a daily basis. In this monitoring, only the qualifying assets (cash and O/N placements and assets accepted as collateral by the CBRT) are included in the liquid asset definition.

In the two-largest member with the highest exposure rule applied in daily liquidity monitoring, the settlement risks are calculated with a minimum 99.5% confidence level; however, in the stress tests conducted with a minimum 99.9% confidence level, the principle which stipulates the settlement risk of the largest member with the highest exposure to be covered by the qualifying resources belonging

to the CCP default management is also applied. In the based-case scenario used in the stress tests, the volatilities selected separately with a 99.9% confidence level from a minimum 5-year historical data for each risk factor are assumed to be occurred simultaneously, without taking account of the correlations among them, and the base-case scenario is supported by two different historical-event scenarios. In the VIOP stress test scenario, the liquidation period is applied as three days.

Since, in the application of the largest member with the highest exposure rule, the principle which stipulates the settlement risk to be covered by the qualifying assets belonging to the CCP default management is adopted, both the qualifying collateral remaining above this obligation and other highly-liquid assets that are included in the default management resources and can be converted easily into cash are considered as additional (backup) liquidity reserve.

7.5. 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.

Almost all of Takas Istanbul's default management resources allocated in the markets to which it provides central counterparty service is comprised of liquid resources that can be used as cash on the same day or at the latest on the next business day. Accordingly, the ratio of the sum of;

- the cash portion out of the margin requirements and guarantee fund contribution amounts deposited in cash by the members, which is invested on an O/N basis to the special accounts protected by Article 73/2 of the Law No. 6362 and opened at the banks whose credit default risk is regarded as zero by Takas Istanbul,
- the securities out of the margin requirements and guarantee fund contribution amounts deposited as a non-cash asset by the members, which can be provided as collateral to the CBRT within the borrowing limits of Takas Istanbul,
- the portion out of the capital allocated and committed from Takas Istanbul capital to the CCP default management, which is placed with O/N maturities to the credible commercial banks or invested into the securities that can be provided as collateral to the CBRT within the borrowing limits of Takas Istanbul,

available among VIOP, SLM and BIAS Money Market qualified default management resources as of 30/06/2017 against default of the member with the highest margin requirement is respectively 333%, 193% and 104%; the same ratio for largest two members is 270%, 155% and 129% respectively.

The ratio of the liquidity (borrowing) limit that can be obtained by Takas Istanbul from the Central Bank of the Republic of Turkey by providing the necessary collateral to the total risk calculated with a minimum 99.5% confidence level in VIOP, SLM and BIAS Money Market as of 30/06/2017 77.9 %.

Takas Istanbul has an extremely developed infrastructure and risk management function that it can use in accessing to the liquidity of CBRT and commercial banks.

7.6. 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.

In addition the qualifying assets (cash or assets accepted as collateral by the CBRT) referred to in (7.5) above, Takas Istanbul only accepts highly-liquid assets in the markets to which it provides CCP service. In accepting as collateral of the assets not accepted as collateral by the CBRT (i.e. share certificates and securities investment funds), attention is given to the liquidity of the stocks (the index to which they belong), and for the securities investment funds, to the content of the funds; and all assets, except for cash, are received as collateral within certain composition limits.

As explained (in 7.1 and 7.4) above; Takas Istanbul aims to resolve, in the CCP markets, the default of its largest two members under the normal risk calculation it has made with a minimum 99.5% confidence level, whereas the default of its largest member with the highest exposure under the stress tests it has conducted with a minimum 99.9% confidence level only with the qualifying assets; hence the use of additional liquid resources in the form of assets not accepted as collateral by the CBRT is considered as a situation which may only occur upon default of the members delivering these resources and whose adverse impact on the markets should remain limited.

Takas Istanbul does not consider the borrowing facility from the CBRT late liquidity window (with a higher cost) as an instrument to resolve the liquidity requirement under normal conditions.

7.7. 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.

Takas Istanbul requires no additional liquidity provider, except for the liquidity of the Central Bank of the Republic Turkey to which it has the right to access pursuant to its status and can use when

needed, and in determining the minimum liquidity requirements of the CCP markets, the access opportunity to the liquidity of CBRT is not regarded as an ordinary resource.

Takas Istanbul only accepts the banks and the capital market brokerage firms to the CCP membership. In Turkey, banks are subject to the BRSA's, whereas the brokerage firms are subject to the Capital Markets Board's license, supervision and oversight; and any weakness they may show in the liquidity management is subject to severe sanctions.

Takas Istanbul reviews the creditworthiness of the banks in which it invests the collateral of both CCP members and CCP markets or from where it can get commercial debt when needed, at least two times a year through the internal credit rating and assessment system; and in the internal credit rating, the independent credit rating notes of the institutions, if any, are used for validation purposes.

Takas Istanbul invests the cash margin requirements and guarantee fund contribution amounts of the CCP markets to the special accounts protected from the liquidation or the proceeding of the creditors of both Takas Istanbul and the relevant commercial bank with Article 73/2 of the Law No. 6362, with O/N maturities at the commercial banks whose credit default risk and risk of loss is regarded as close to zero; and Takas Istanbul is able to access to its liquidity during the day. Cash in the relevant commercial bank is recalled to our accounts at the CBRT each day and re-invested; hence, access to the liquidity is tested on a daily basis.

In Turkey, the banks have access opportunity to both the CBRT liquidity and the debt securities outright trading or reverse-repo/repo markets or money markets whereas the brokerage firms can meet their liquidity needs from money markets operated or the debt securities outright trading or reverse-repo/repo markets.

In addition; since the liquidity of the CCP markets cannot be used for Takas Istanbul's other liquidity requirements, the likelihood of encountering systemic liquidity shortfall and spreading of such shortfall to the CCP markets is considered extremely low.

7.8. An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.

By virtue of its banking license, Takas Istanbul has an access opportunity to the liquidity of the Central Bank of the Republic of Turkey and also operates in an integrated manner with the Turkish Lira, Electronic Funds Transfer (EFT) System and Electronic Securities Transfer System (ESTS) in the CBRT's system. Through Takas Istanbul Electronic Funds Transfer System (TETS) that it has established, Takas Istanbul offers to its member brokerage firms an access opportunity to the national payment system (EFT-ESTS); hence it enables its members to also make use of the payment systems.

By means of the SWIFT system to which it is a member and the nostro and custody relationships it has established with the highly-credible international custody institutions and banks located abroad, Takas Istanbul also has the configuration and organization to manage its foreign currency securities and liquidity in the best manner.

7.9. 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.

Due to its banking license, Takas Istanbul is subject to the liquidity and stress test arrangements of the BRSA at the corporate scale. In this context; the liquidity gaps estimated with a minimum 99% confidence level and adjusted with discount factors determined by the BRSA are used for each currency in the liquidity stress tests conducted on monthly intervals, and the costs to be exposed due to funding of the estimated liquidity gaps again under stressed are estimated, and the achieved results constitute a basis for the capital allocation for the liquidity risk during the internal capital adequacy assessment process (ICAAP). The results of the stress tests conducted in accordance with the banking legislation are reported to the senior management, the Supervision Committee and the Board of Directors.

Since a structure which would prevent the risks arising from Takas Istanbul's other activities from affecting the CCP markets has been established at Takas Istanbul, the sufficiency of both total resources and liquid resources is tested under various assumptions only in the stress tests conducted with an FMI perspective specific to the CCP markets. In the based-case scenario used in the stress tests, the volatilities selected separately with a 99.9% confidence level from a minimum five-year historical data for each risk factor are assumed hypothetically to be occurred simultaneously, without taking account of the correlations among them, and the base-case scenario involving extreme conditions with a highly low chance of combined occurrence is supported by two different historical-event scenarios. Stress is also applied to the liquidation period for the VIOP market.

In the stress tests conducted monthly for the CCP markets, whether or the CCP default management resources will be sufficient in case of combined default of the largest two members under the stress conditions depicted with a minimum 99.9% confidence level is also checked; and besides, whether or not the default of the largest member with the highest exposure under the same stressed conditions can be covered only with the qualifying assets (cash and assets that can be provided as collateral to the CBRT) is tested.

Stress tests in the CCP markets are executed based on the fact that the liquidity risk in these markets is assumed by Takas Istanbul and more specifically, only by the CCP default management resources.

The comprehensive CCP stress test results on quarterly periods are submitted to the senior management and to the Supervision Committee and the Board of Directors through the internal system units. If, in the stress tests, a possibility of facing with any cash or qualifying resource deficit occurs in the CCP default management resources, the measures that need to be taken must be presented in the report submitted to the Board of Directors. The CCP stress test reports submitted to the Board of Directors are also conveyed thereafter to the Capital Markets Board.

The Internal Audit Team reporting to Takas Istanbul Board of Directors is in charge of examining the validity of the CCP risk management and collateral valuation models and techniques at least once a year. Stress test scenarios and parameters are subject to the same principles with other risk models and reviewed at least once a year.

7.10. 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.

Takas Istanbul undertakes the settlement finality by using the default management resources, where it acts as the “Central Counterparty” through the open-offer method, Takas Istanbul is obliged to deliver or pay its cash payment commitments within the normal settlement period irrespective of any default, its asset delivery obligations until the end of the period allotted in the relevant market procedures to find the asset and, if it fails to do so, the market value thereof until the end of the same period. Setting aside the measures that may be taken in extreme conditions under the default management (such as variation margin, making deductions from dividend distribution, etc.), Takas Istanbul is obliged to pay default interest to its members for the delayed period should the settlement commitments be failed to be timely fulfilled for any reason. The obligations of Takas Istanbul as a Central Counterparty to its members are explicitly stipulated in the relevant market directives and procedures.

Excluding the period allotted in the asset defaults to find the asset; if there exists no condition which necessitate resorting to the extraordinary measures by the CCP Default Management Committee, default of its one or several members is not a factor that would cause Takas Istanbul to not to fulfill its obligations arising against its members.

In Article 36 of the CCP Regulation, it is explicitly stated that in case of default, Takas Istanbul is not limited to the liquidity in its default management resources, and the order made in the Regulation for the use of default management resources is intended the loss allocation, and Takas Istanbul can make the necessary prioritization with respect to the liquidity management and may borrow to manage the default, when needed. Hence; it is possible for Takas Istanbul to promptly eliminate a default-originated liquidity shortfall and fulfill its commitments on time by firstly using the liquid resources to which it invested its capital allocated and committed to the default management and/or accessing to the CBRT liquidity, where necessary.

Should the default management resources be used, how they will be replenished is stipulated in the relevant Market Directives and Procedures. The members can be asked to deposit additional guarantee funds four times in a year. The members are obliged to fulfill their additional guarantee fund obligations within 5 business days after the date of request.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 7:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul has the capacity to effectively measure, monitor and manage its liquidity risk. In the central counterparty activities; in case of default of the member with the largest exposure under extreme stressed conditions, the default is aimed to be resolved only with the cash resources (without resorting to other qualifying collateral).

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.

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.*

Key consideration

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

Takas Istanbul undertakes the fulfillment of the obligations of the parties and completion of settlement for the conducted transactions by acting as the counterparty against each party in the markets to which it provides central counterparty service. In Article 6 of the Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles, it is stated that the liability of Takas Istanbul in its capacity as a central counterparty against the member shall start at the moment when the buy/sell or bid/ask orders are matched and end with the completion of the settlement. In the same Article, it is also stated that the completion of settlement shall take place by delivery to the relevant accounts or transfer between the accounts of the payables and receivables arising out of the positions generated upon matching of the orders in the markets to which CCP service is provided. Hence, the point at which settlement is final is accepted as the point at which the transfer of assets between the accounts is executed.

Pursuant to Article 79/1 of the Capital Markets Law No. 6362 stipulating the "settlement finality", revocation or reversal of the payment and transfer instructions after the completion of settlement cannot be possible. In Article 79/1 of the Capital Markets Law No. 6362, it is stated that "clearing and settlement instructions and transactions of the capital market instruments as well as the payment transactions cannot be revoked or reversed, including the temporary or permanent suspension of the activities of the members of the central clearing and settlement institutions and the initiation of liquidation processes before administrative and judicial authorities".

In the markets to which central counterparty service is provided, the settlement commitments are between the members and Takas Istanbul. Settlement commitments between the members are not possible. The reciprocal obligations of Takas Istanbul and the CCP members arising from the settlement cease upon completion of settlement. Takas Istanbul's CCP services are limited to Turkey; and the reciprocal obligations of Takas Istanbul and the CCP members are explicitly stipulated in the legislation and the membership agreements.

Takas Istanbul fulfills its cash obligations against the CCP members by making transfer to the accounts of the members at Takas Istanbul; whereas, the members fulfill their cash obligations against Takas Istanbul by making transfer to their accounts at Takas Istanbul. In order for the members to be released from their cash settlement obligations, it will be sufficient to have the transferred amounts credited to Takas Istanbul's accounts at the CBRT. The risk (i.e. default risk of the intermediary bank) during the period to be elapsed until the cash transferred by the member is credited to the Takas Istanbul's account belongs to the member; whereas the risks that will arise after crediting it to the account belong to Takas Istanbul. The loss to be incurred in case of occurrence of such a risk cannot possibly be covered by the CCP default management resources. Takas Istanbul fulfills its cash obligations against the members by making transfer to the accounts of the members at Takas Istanbul. Execution of transfer ceases Takas Istanbul's obligation in its capacity as CCP. For example; if the member wishes to withdraw that amount and Takas Istanbul falls into default for any reason, neither the receivable of the member nor the loss to be incurred can be possibly covered by the CCP default management resources. This issue is explicitly stipulated in Article 6 of the Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles by stating that "From the moment that Takas Istanbul's undertaking for the completion of settlement is fulfilled, the losses that may be incurred by the counterparties for whatever reason cannot be associated with the default management resources designated in accordance with the CCP Regulation". On the other hand, in order for the asset obligations to have been fulfilled, the virement instructions received from Takas Istanbul or the CCP members should have been executed by the depository institution. Risks that may arise until the execution of the asset virement instructions belong to the parties.

8.2. 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.

In the Securities Lending Market to which Takas Istanbul provides CCP service, both the lending, borrowing and the debt closing transactions are conducted intraday and by Real Time Gross Settlement (RTGS) system. The members can monitor the execution of settlement online from the SLM member screens.

In the Futures and Options Market, settlement of the variation margin is made on T, clearing and settlement of the cash-settled contracts is made on the day-T being the maturity date, and settlement of the contracts based on physical delivery is detailed in the market procedure. During the day-T, variation margin calculations are made at hourly risk calculation instances, the variation margin calculations subject to the final settlement are made at the end of the day and debit /credit of cash collateral is initiated afterwards. On the other hand, those who have variation margin payables to Takas Istanbul can fulfill their margin call obligations on the next day until 15:00. Transferring the profit physically does not create any adverse effect on the collateral balances of the member/customer.

Settlement date is T+2 for transactions at the Borsa Istanbul Equity Market. The calculation of the settlement obligation (cash/security out to get net debt or receivable) multilateral netting method is conducted at customer / portfolio basis. As a result of clearing, settlement instructions are prepared for members on security and cash basis. The liabilities of the members are based on the settlement instructions created.

Settlement date of transactions at the Borsa Istanbul Money Market is the next business day (T + 1). Transactions are netted at member and risk group basis in terms of value date and maturity date. Net cash liabilities related to the transactions realized in the market are to be settle up to 16.45 o'clock at the account opened by members at Takas Istanbul

In the markets where it provides CCP service, Takas Istanbul has not had any experience which is not explicitly stipulated in the Market Directives and Procedures or in which it has failed to execute the final settlement on time due to an unforeseeable reason.

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

In the markets where CCP service is provided, the matched orders cannot be cancelled by the members, and the cancellation of matched orders can only be made by Takas Istanbul in the SLM and by BİAŞ in the Derivatives Market, Equity Market and Money Market, with limitation to the situations set forth in the legislation.

In addition, it is not legally possible for the members to reverse or cancel their obligations arising from matched orders or the payments and transfers they have made to fulfill these obligations. In Article 79/1 of the Law No. 6362, it is stated that “clearing and settlement instructions and transactions of the capital market instruments as well as the payment transactions cannot be revoked or reversed”. Thus; cash or assets blocked at Takas Istanbul for cash obligations and at the central securities depository -CRA for asset obligations cannot be returned to their origin even if their settlement (asset and cash exchange) has not been yet executed.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 8:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul provides the final settlement at a minimum by the end of the settlement date, and it has the capacity to provide final settlement intraday or in real time in the appropriate markets.

Principle 9: Money Settlements

An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.

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.*

Key considerations

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

Owning the banking license, Takas Istanbul conducts its money settlements in the accounts opened at itself, and no central bank money or commercial bank money is used in the money settlements.

Members who have the money liabilities transfer the relevant amount to the Takas Istanbul accounts at CBRT via EFT system and fulfill their settlement obligations which arise at the settlement accounts at Takas Istanbul by using the money amounts reflect on their current accounts at Takas Istanbul. In the same way, cash credits of the creditor members are transferred to their current accounts at Takas Istanbul and these members can transfer these amounts to their other bank accounts opened at CBRT via EFT.

In addition to the Turkish Lira accounts opened at Takas Istanbul, USD and EURO accounts are also used for the cash collateral and settlement transactions; however, there is no need to conduct settlement over foreign currency. For EURO and USD transfer transactions, the foreign correspondent banks in Frankfurt and New York and the SWIFT system are used.

In the CBRT legislation, there exists no arrangement which envisages the offering of money settlement service. Indeed, the fact that Takas Istanbul owns a banking license, has an access opportunity to the CBRT liquidity and conducts the settlement transactions at itself by using the CBRT payment systems and no commercial bank money is used in settlement, thus, not being exposed to credit and liquidity risks, makes the use of CBRT money not a need.

9.2. 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.

In the money settlements, the Turkish Lira and Foreign Currency (EURO and USD) demand deposit accounts at Takas Istanbul are used; and the money transfers are conducted through the CBRT electronic payment systems or the SWIFT.

Although Takas Istanbul is not using commercial banks for the money settlements, it holds the cash collateral of the CCP markets in the special O/N term deposit accounts opened at the commercial banks whose credit default risk and risk of loss is regarded as close to zero, and protected from the liquidation or the proceeding of the creditors of Takas Istanbul and the relevant commercial bank with Article 73/2 of the Law No. 6362.

9.3. 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.

Owning a banking license, Takas Istanbul conducts its money settlements in the accounts opened at itself, and no commercial bank money is used in the money settlements.

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

Takas Istanbul conducts its money settlements in the accounts opened by its members at itself, and as it is explained in a detailed manner in the foregoing principles, it has the knowledge, experience, organization, legislation and technical infrastructure to minimize and ideally manage its credit and liquidity risks.

9.5. 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.

Owning the banking license, Takas Istanbul conducts its money settlements in the accounts opened at itself; and no commercial bank money is used in the money settlements.

In addition to the Turkish Lira accounts opened at Takas Istanbul, USD and EURO accounts are also

used for the cash collateral and settlement transactions; however, there is no need to conduct settlement over foreign currency. For EURO and USD transfer transactions, the foreign correspondent banks in Frankfurt and New York and the SWIFT system are used.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 9:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul concludes the money settlements in the accounts opened by its members at itself, and no CBRT money or commercial bank money is used in the settlement. Takas Istanbul has the knowledge, experience, organization, legislation and technical infrastructure to minimize and ideally manage its credit and liquidity risks that may arise due to its preference for this method.

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.

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.*

Key considerations

10.1. An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.

Takas Istanbul also provides central counterparty service for the derivative contracts with physical delivery option being traded in the organized derivative markets. Accordingly; Takas Istanbul currently may have a physical delivery obligation for the derivative instruments whose underlying asset is stock. No derivative contract carrying physical commodity delivery obligation is traded in the VIOP.

Obligations of the members and Takas Istanbul regarding the physical delivery are exclusively stipulated in a comprehensive manner in the Directive and the Procedure for the clearing & settlement and CCP service to be provided in Borsa Istanbul Futures and Options Market (VIOP). These documents are available to the members and public on our website.

In case of default of the member under physical delivery obligation at VIOP, it is envisaged that the underlying assets subject to physical delivery shall be obtained from the relevant markets by the margin requirements of the defaulting member and Takas Istanbul's obligations shall be closed. For this reason, physical delivery margin is demanded at VIOP while calculating the margin of the physically-delivered contracts. Should the asset subject to the physical delivery be failed to be obtained within the time period prescribed in the Procedure, its market value calculated in the manner specified again in the Procedure is paid to the recipient; and the recipient, if wishes, can demand the payment of its market value instead of the asset.

10.2. An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.

For the derivative contracts with physical delivery option; physical delivery margin at an amount calculated by taking account of the total time period allotted for the physical delivery is requested from the members against the risks that may be exposed in a physical delivery default. The physical delivery is made in book-entry form in the accounts at Takas Istanbul or the central securities depository - CRA.

The delivery obligations of the members, and accordingly, of Takas Istanbul, regarding the physically-delivered contracts can be monitored in Takas Istanbul system together with the physical delivery requests of the members; and from their screens, the members are able to follow their physical delivery obligations and whether or not their physical delivery requests have been fulfilled.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 10:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul has clearly defined its obligations relating to the physical delivery and the risks associated with these obligations in the markets to which it provides CCP service. The physical delivery obligations and risks can be monitored and managed in an effective manner.

Principle 12: Exchange-of-value settlement systems

If an FMI settles transactions that involve the settlement of two linked obligations (for example, 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.

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.

Key considerations

12.1. 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.

In the markets to which Takas Istanbul provides CCP service, exchange-of-value settlement exits only in the derivative contracts with physical delivery (collecting the value of asset subject to the physical delivery and transferring the asset). As a rule, the linked transactions in the physical delivery are made subject to settlement/clearing on a net basis. Pursuant to the CMB's decision, gross settlement/clearing is also possible for the equity derivatives with physical delivery within the scope of gross settlement practice.

Since Takas Istanbul operates in the settlement always in accordance with the delivery-versus-payment (DvP) rule, no principal risk arises. In the VIOP Directive and Procedure, it is clearly stated that with respect to the relationship between Takas Istanbul and the member, the delivery-versus-payment (DvP) rule shall be applied for the settlement of the transactions conducted in the market. The final settlement for the linked transactions in the physical delivery is simultaneous. Due to the fact that Takas Istanbul conducts the money settlement in the accounts at itself, no virement instruction can be placed to the central securities depository - CRA for the asset delivery unless the monetary value is blocked. In an opposite situation, however, the monetary settlement cannot be concluded until the assets at the depository institution CRA are transferred to Takas Istanbul's disposition, and the value of the assets cannot be recorded to the free account of the member. After completion of both legs of the cash and asset blockage, the execution of the final settlement is an automatic process triggered by the "system". Thus; the final settlement is executed simultaneously by the system upon completion of the second leg of the blockage.

In the linked transactions, the assets subject to the blockage are held in the accounts and at the disposition of Takas Istanbul during their blockage period in Takas Istanbul or the depository institution. In Article 79/1 of the Capital Markets Law No. 6362, it is stated that "clearing and settlement instructions and transactions of the capital market instruments as well as the payment transactions cannot be revoked or reversed, including the temporary or permanent suspension of the activities of the members of the central clearing and settlement institutions and the initiation of

liquidation processes before administrative and judicial authorities". Thus; cash or assets that are blocked or moved to the pool at Takas Istanbul for cash obligations and at the central securities depository - CRA for asset obligations cannot be returned to their origin even if their settlement (asset and cash exchange) has not been yet executed; hence they cannot possibly be subject to any attachment or similar claim of third parties.

In the CCP services it offers, Takas Istanbul is not dependent on the DvP or PvP services provided by the central securities depository -CRA or another institution. On the other hand; all types of integration and connection technically required during the trading, clearing & settlement and custody processes of the capital market instruments are in place between Borsa Istanbul, Takas Istanbul and the CRA. Business continuity between Takas Istanbul and the CRA regarding the trading and default transactions is regulated by a service agreement.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 12:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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In the settlement, Takas Istanbul uses the delivery-versus-payment (DvP) system, and for the transactions that involve the settlement of two linked obligations, it eliminates the principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.

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.

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.*

Key considerations

13.1. 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.

Under what conditions Takas Istanbul CCP members shall be deemed to have defaulted is explained in the relevant Market Directives and Procedures, particularly in the CCP Regulation and also incorporated into the Membership Agreements. Pursuant to the first paragraph of Article 35 of Takas Istanbul CCP Regulation; if a CCP member fails to fulfill completely and in due time its margin call and guarantee fund contribution, delivery or payment obligations prescribed for each market or capital market instrument, as well as its delivery or payment obligations regarding the transactions it conducted, the member is deemed to have defaulted without the need for any further notification.

Actions to be confronted by the CCP member deemed defaulted for any reason are set forth in the relevant Market Directives and Procedures; whereas, how the actions and transactions relating to the default will be handled at Takas Istanbul are set forth in the Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles. In this context, the member deemed defaulted can be allotted a time period pursuant to the Takas Istanbul Central Counterparty Regulation, Article 35/3 and prescribed in the relevant Market Directives and Procedures to fulfill its obligation. This time period which can be allotted for the defaults not resulting from any "financial inadequacy" called in the international principles and practices as "technical default" or "operational default" is defined as "pre-default" in Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles.

In Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles; the events of default wherein the member delays fulfilment of its clearing and settlement obligations up to, at most, the deadlines set forth in the relevant directives and procedures and which

do not hinder the continuation of the member activities are defined as pre-default; and the measures that can be taken about the member in case of frequently recurring pre-default events are specifically stipulated. If the member fails to fulfill its obligation within this time period defined as pre-default, “the CCP Default Management Committee may convene and extend the pre-default period until the end of the next business day” provided that the default of the member has resulted from a reason other than its financial inadequacy (operational or technical). Collateral outflow from the member accounts and/or engaging in any risk-enhancing transaction by the member can be prevented during the course of pre-default. It is also possible to impose disciplinary penalties about the member or administrative sanctions on the accounts associated with the member causing the default. If the CCP Default Management Committee does not extend the pre-default period of the member or the member fails to fulfill its obligation despite the additional time period being allotted, the CCP member is considered defaulted and the default of the member is immediately notified to the Capital Markets Board and other concerned institutions. Following the notification, all types of necessary actions to resolve the default have to be taken in accordance with the decisions of the CCP Default Management Committee to be made by taking account of the CCP legislation as well as the international principles and best practices, where necessary.

Pre-defaults can be terminated by using the initial margins of the defaulting member, however the use of other default waterfall resources including the defaulted member’s guaranty fund contributions can only be possible by the decision of the CCP Default Management Committee and the notification of the member default to the Capital Markets Board and relevant institutions.

As long as the defaults are closed within their time periods, the event of pre-default is not regarded as a situation which definitely necessitates the termination of CCP membership, despite the disciplinary penalties that may be imposed. However, it not possible for a member and the customers associated with that member whose default is declared by the CCP Default Management Committee decision due to financial inadequacy and exposed thereby to the actions of Takas Istanbul’s CCP Default Management Committee to not to be affected from these actions at all or continue its transactions in the normal manner. Default management actions to be taken in the CCP Default Management Committee depending on the financial inadequacy would have initiated a process which will simultaneously necessitate the CCP membership to be interrupted and most likely to be completely terminated in the end.

The major tools that can be used by the CCP Default Management Committee in the default management are; porting positions, their closing, sale through auction or force transfer, the restriction of profit distribution on the futures and options markets and the hedging transactions. And decision regarding the use of CCP Default Management Resources in the required amount and order, including the use of the deposited guarantee fund contribution amounts of non-defaulting members and requesting additional guarantee fund contribution amount from non-defaulting members, shall be made by the Default Management Committee. The responsibilities of the non-defaulting members are explicitly stipulated in the membership agreements and the Market Directives and Procedures. Takas Istanbul’s CCP default management process is designed not as a set of rules that must be applied in the same way under all circumstances without considering their effect, but as a process which enables the CCP Default Management Committee to use its discretionary power in a manner to look after the interests of both the defaulting member and Takas Istanbul as well as

the non-defaulting CCP members and the markets. Pursuant to the Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles, the CCP Default Management Committee shall consider the reason of default and its effects on the markets when employing the default management tools. The CCP Default Management Committee is authorized to take other measures that it deems necessary by taking account of the relevant legislation, the agreements signed with the members and the international principles. Hence, even though it is not explicitly included in the CCP legislation, it is very well possible, in the default management, to develop new mechanisms which can limit the adverse effects of the default or implement the examples of good practices. The order and timing of the default management actions are also issues that are likewise left to the discretion of the CCP Default Management Committee provided the provisions of the legislation shall be taken into account.

Takas Istanbul has established the default management resources that it will use in case of default of the members in the markets to which it offers CCP service by taking account of the replenishment of these resources and the examples of good practices, and a default management system that will ensure Takas Istanbul to continue its CCP services in an uninterrupted manner even under extreme conditions has been designed.

In Takas Istanbul CCP model, the safety of both the market and Takas Istanbul is addressed at the highest level. In CCP default management, Takas Istanbul's capital can be used in two separate tranches as allocation and commitment. The use of the portion allocated from Takas Istanbul capital to the CCP default management (*SIG-skin in the game*) before the guarantee fund contribution amounts of the non-defaulting members is compulsory. On the other hand, the portion committed from Takas Istanbul capital to the CCP default management shall be used after the funded and unfunded guarantee fund obligations of the non-defaulting members.

The default management resources and their sequence for use are stipulated in Article 36 of the CCP Regulation as given below.

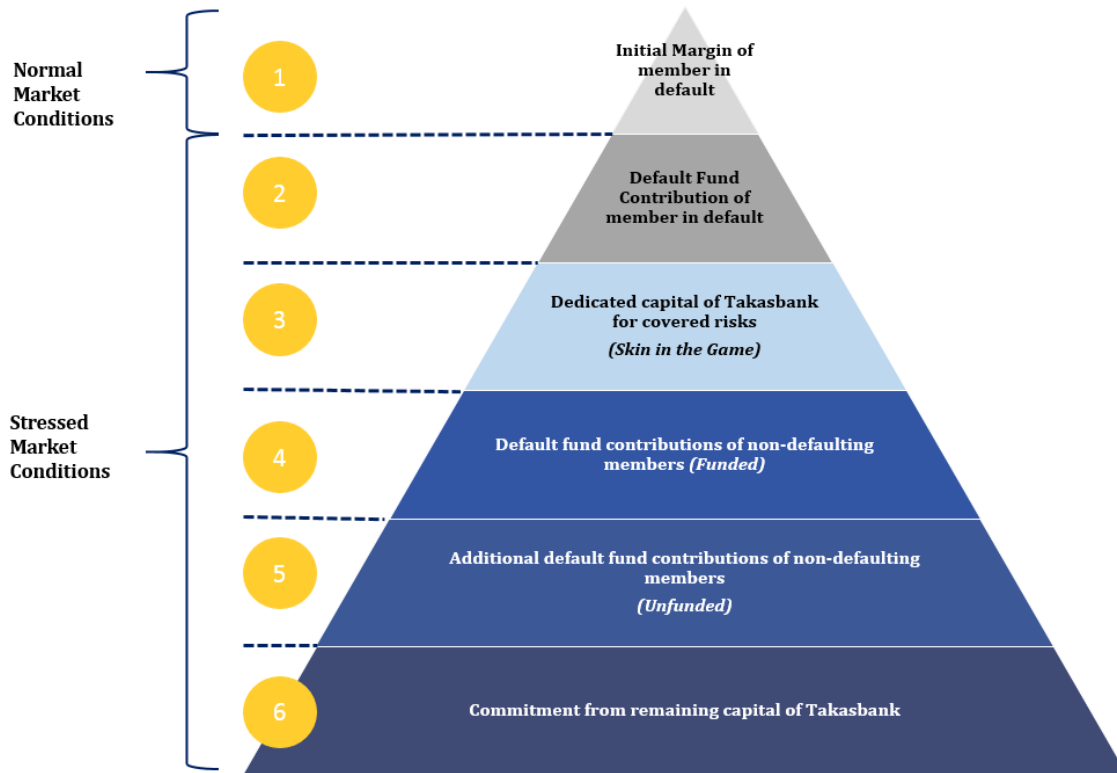


Figure 4- Takas Istanbul Default Management Resources and Order of Use

Calculation of the capital allocated and committed from Takas Istanbul capital to the CCP default management is made in accordance with Basel 2 Capital Adequacy Arrangements and EMIR Master Document (EU) No 648/2012 of the European Union and EMIR technical arrangement (EU) 152/2013 and (EU) 153/2013 on the capital adequacy and default waterfall of central counterparty institutions (please see. Figure 5), and the capital amounts allocated and committed separately by the Board of Directors on the basis of markets to which CCP service is provided and the period in which they will be applicable are disclosed to public.

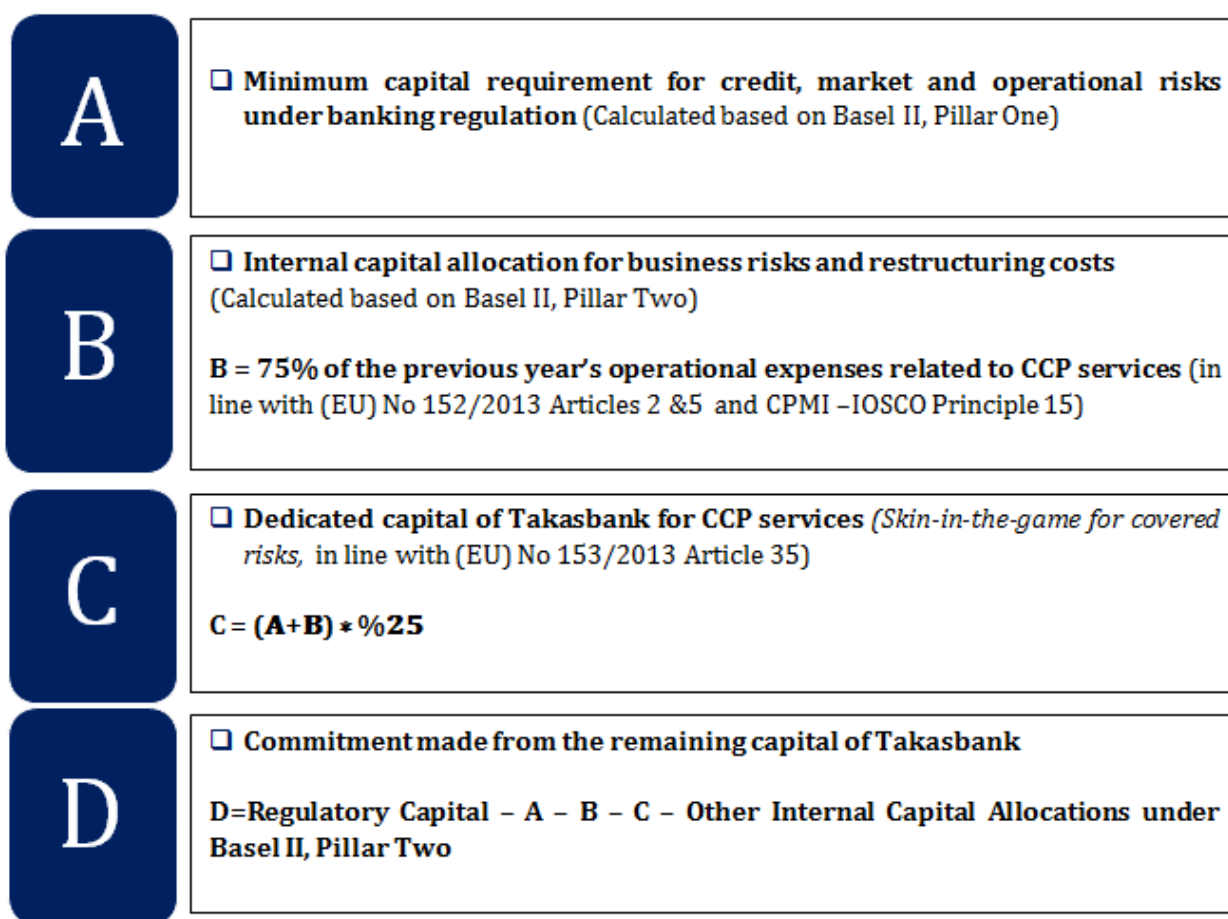


Figure 5- Capital 'allocated' and 'committed' to the CCP default management by Takas Istanbul

The use of Takas Istanbul capital in CCP default management is designed in a manner that would enable Takas Istanbul to survive under all circumstances, but also to use its entire capital remaining above the regulatory and internal capital obligations, where necessary. Pursuant to the sixth paragraph of Article 36 of the CCP Regulation, the payments to be made in advance by the stakeholders or other people and institutions as to be used for Takas Istanbul's potential capital increase as well as the equity and quasi-equity resource commitments (subordinated loans etc.) of irrevocable nature can also be added to the capital committed in default management, should the need arise.

In order to prevent and liquidity shortage that may be exposed in the default management, the rule which stipulates the sum of liquid collateral of two members having the largest exposure for each market to which CCP is provided, the assets with high-level of liquidity in the guarantee fund established for the relevant market and the amounts allocated and committed by Takas Istanbul from its own capital and invested in liquid assets to not to stay below the settlement risk amount of the said two members calculated with a minimum 99.5% confidence level is applied and monitored on a daily basis. In this monitoring, only the qualifying assets (cash and O/N placements and assets accepted as collateral by the CBRT) are included in the liquid asset definition. In the two-largest member with the highest exposure rule applied in daily liquidity monitoring, the settlement risks are calculated with a minimum 99.5% confidence level; however, in the stress tests conducted with a

minimum 99.9% confidence level, the principle which stipulates the settlement risk of the largest member with the highest exposure to be covered by the qualifying resources belonging to the CCP default management is also applied.

Besides; in Article 36 of the CCP Regulation, it is explicitly stated that in case of default, Takas Istanbul is not limited to the liquidity in its default management resources, and the order made in the Regulation for the use of default management resources is intended the loss allocation, and Takas Istanbul can make the necessary prioritization with respect to the liquidity management and may borrow to manage the default, when needed. Hence; it is possible for Takas Istanbul to promptly eliminate a default-originated liquidity shortfall and fulfill its commitments on time by firstly using the liquid resources to which it invested its capital allocated and committed to the default management and/or accessing to the CBRT liquidity, where necessary.

Should the default management resources be used, how they will be replenished is stipulated in the relevant Market Directives and Procedures. The members can be asked to deposit additional guarantee funds four times in a year. Business rules and time related to margin call for default funds requirements, call for additional default funds in case already deposited default funds is to be consumed in the default management process and requests for contributions of additional guarantee fund contributions from members in the framework of the default management process are specified in the relevant Market Directives and Procedures. Should the capital allocated by Takas Istanbul be used, the exhausted portion is transferred from the committed capital tranche within one month. However; the aggregate amount of transfers to be made in a year as such cannot exceed the first allocation amount made at the beginning of the period.

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

The rules and procedures to be applied in the CCP default management against the defaulting and non-defaulting members have been stipulated in the CCP Regulation and the relevant Market Directives and Procedures; and the rights and powers of Takas Istanbul and the responsibilities of the members in the events of default have also been incorporated into the agreements executed with the members and the legal risks that might arise thereof have been minimized. On the other hand; the internal rules and procedures to be implemented by Takas Istanbul business units in the CCP default management, including the principles of exercising of Takas Istanbul's discretionary power, have been stipulated in the Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles.

The principles regarding the communication to be made with the Capital Markets Board, other regulatory and supervisory entities, Borsa Istanbul, non-defaulting members and other stakeholders in the CCP default management have been stipulated in the Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles. In addition; it is also stipulated that the methods to be employed to facilitate communication and coordination with the defaulting member and their customers for porting of the positions and collateral, when necessary, after the default declaration shall be determined by the CCP Default Management Committee.

It is stipulated that at Takas Istanbul, the CCP Department shall carry out the secretariat operations of the CCP Default Management Committee and prepare and submit to the Committee all types of technical analysis that will constitute a basis for the decisions to be made by the Committee. The Collateral Monitoring & Default Management Team under the CCP Department is responsible for continuous monitoring of the progress of default management resources and the risk/collateral balances and reviewing the collateral management process.

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

The default management rules applied in the markets to which central counterparty service is provided and the procedures regarding management of the process are explained in the Central Counterparty Regulation and the relevant Market Directives and Procedures. These documents are available on Takas Istanbul website.

A comprehensive information document explaining the events of “pre-default” and “default” referred to in Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles stipulating the principles and procedures regarding management of the default management process by Takas Istanbul business units, the establishment of the CCP Default Management Committee thereof and the actions that can be taken by the Committee in relation to the member and customer positions and assets in the events of pre-default and default, the mechanisms that Takas Istanbul will use in fulfilling its obligations against the non-defaulting members as well as the obligations of the members that might arise against Takas Istanbul is published and available for the members and public on Takas Istanbul website.

13.4. 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.

Pursuant to the Takas Istanbul Central Counterparty Regulation on Default Management Implementation Principles, a default management simulation is conducted once a year by the participation of the market participants to be designated by the CCP Default Management Committee to test the executability of the default management processes by Takas Istanbul and ensure their best level management. The results obtained thereof and the recommended legislation revisions is submitted to the CCP Default Management Committee and further reported to the CCP Risk Advisory Committee and the Board of Directors. The first fire drill was conducted between October 10-13,2016 for BİAŞ Futures and Options Market. The test was conducted by two clearing member, one is to default and the other is to cover the market orders initiated during default management process.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 13:

Observed <input type="checkbox"/>	Broadly Observed <input checked="" type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul has effective and clearly-defined rules and procedures for managing the default of the CCP members. These rules and procedures have been designed in a manner to

enable Takas Istanbul to timely act and constrain possible losses and liquidity pressures and continue to fulfill its obligations in case of any default in the CCP markets.

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.

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.

Key considerations

14.1. 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.

Principles regarding segregation and portability of the positions and collateral in the markets to which Takas Istanbul provides CCP service are stipulated in Articles 25 and 26 of the CCP Regulation. Market-specific arrangements for the segregation and portability of the positions and collateral are also included in the relevant Market Directives and Procedures.

Position and collateral segregation in the markets in which the central counterparty service is provided are addressed in two levels.

- (i) The positions and collateral of the members' customers are monitored separately at Takas Istanbul from the positions and collateral of the member's own portfolio.
- (ii) The positions and collateral of the individual customers can be monitored, upon their request, in the individual customer accounts associated with the member, separately from the positions and collateral of other customers; and whether or not to offer a individual account alternative to the customers in the spot (cash) markets is at Takas Istanbul's discretion. However, offering a individual position and collateral account alternative to the customers is compulsory in the derivative markets.

Pursuant to the Market Directive approved by the Capital Markets Board, the customer positions and collateral are currently monitored in the individual customer accounts associated with the member both in the organized derivatives market VIOP and in the SLM and no omnibus account alternative is provided for the customer positions and collateral. In the Equity Market and BİAŞ Money Market, a portfolio account is an account of the transactions made by the member for its portfolio and it is essential that the customer positions are monitored collectively in omnibus accounts. It is accepted by Takas Istanbul that the collateral deposited by the members to the collateral accounts associated with the omnibus accounts belongs to the Member. Separately, it is necessary to monitor the customer positions and guarantees in the Equity Market at individual position accounts opened in Takas Istanbul and the customer's collateral sub-accounts provided that they are requested by the CCP member and the conditions specified in the Procedure are met.

Pursuant to the third paragraph of Article 25 of the CCP Regulation, customer collateral associated with the positions in the individual position accounts can be used neither for the collateral deficits in the CCP member's own portfolio nor for those in other individual customer accounts. Hence; an infrastructure which will prevent the default or insolvency of the member or other customers associated with the member from affecting the positions and collateral in the individual customer accounts is provided with the CCP Regulation. On the other hand, Takas Istanbul does not deal directly with the customer in the CCP services, and it is also not liable for the obligations of the member against its customer. The disposition right on the individual customer accounts opened at Takas Istanbul belongs to the member, and Takas Istanbul constrains the right of the customer to withdraw collateral from these accounts only for the collateral (exposure) amount required to be maintained. Thus, the excess collateral in the individual customer accounts which remains above the required obligation can be freely withdrawn by the member. The disposition right of the member on the accounts is constrained in case of default, and unless specifically permitted, the member cannot conduct any transaction on the accounts. Therefore; as long as no case occurs against the Capital Market Law such as the use of customer collateral out of the customer's knowledge or instruction or their purpose, the collateral deposited to the individual accounts at Takas Istanbul is protected from the default and insolvency of both the member and other customers. Although Takas Istanbul is not the direct addressee of the members' customers, it aims to further increase the security of the customer collateral through a system in which the individual investors are able to examine their positions and collateral in their individual accounts associated with the customer via remote access.

Upon written request of the customer to be made before the default to the member to whom it is associated and further to the transfer or member's approval and the transferee member's acceptance, the positions of the customer and the collateral accounts to which they are associated can be ported by Takas Istanbul to the accounts to be opened by the transferee member.

In case of default, however; if any designation for the transferee member is made beforehand, the porting of the positions and collateral in the individual customer accounts monitored in the accounts associated with the defaulting member is aimed to be conducted within 24-hours after the notification of default without the need for further approval of the defaulting member.

If no designation for the transferee member is made beforehand, the porting can only be possible to the extent that a member willing to take over the positions and collateral is found during the time period to be elapsed until the positions are liquidated by any action.

Takas Istanbul can prevent withdrawal of collateral by the transferee member until the reconciliation between Takas Istanbul records and the records of the defaulting member in relation to the ported collateral is achieved.

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

In the VIOP and the SLM, Takas Istanbul monitors the positions and collateral of the CCP members' customers in the sub-customer accounts defined separately for each customer under the accounts opened in the name of member. In the Equity Market and in the BİAŞ Money Market, position and collateral accounts of the portfolio are monitored under the member portfolio accounts, while the positions and collateral related to the customers are monitored at omnibus accounts segregated those of members.

Individual customer accounts are segregated from the accounts in which the positions and collateral belonging to the member portfolio are monitored as well as from other customer accounts. Offsetting among the customers' individual position accounts or the customer accounts and the member portfolio accounts or using the collateral in the individual customer accounts for the collateral requirements arising from another individual customer or member portfolio account is not possible. Collateral monitored in the accounts belonging to the member portfolio can be used to cover the collateral requirements arising from the customer positions.

Accounts at Takas Istanbul are opened by the members whether they are for portfolio or the customer, and the power of disposition on the accounts belongs to the member. There is no legal relationship established between Takas Istanbul and the members' customers. If, upon default of the member, the customer positions and collateral are ported to another member, the new member's right to withdraw the ported collateral from the defaulting member can be constrained until the reconciliation between Takas Istanbul records and the records of the defaulting member is achieved.

In the markets to which Takas Istanbul provides CCP service, the margin requirements and the guarantee fund contribution amounts are monitored in separate accounts, and the clients' margin requirements are used for the initial margin and variation margin obligations.

14.3. 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.

Takas Istanbul's CCP legislation has been designed in a manner to allow both pre-default and post-default porting. The portability of collateral and positions is specifically stipulated in Article 26 of the CCP Regulation.

For the pre-default porting operations; the transferor member's approval and the transferee member's acceptance must be conveyed to Takas Istanbul in writing. Takas Istanbul performs the porting operations by taking account of the compliance of the transferee member's with the limit and position thresholds.

For the porting operations to be conducted due to default of a CCP member, however; if any designation for the transferee member is made beforehand, the porting of the positions and collateral is aimed to be conducted within 24-hours after the notification of default without the need for further approval of the defaulting member. If no designation is made beforehand, the porting can only be possible to the extent that a member willing to take over the positions and collateral is found during the time period to be elapsed until the positions are closed by any action.

14.4. 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.

Arrangements relating to the segregation and portability are stipulated in Articles 25 and 26 of the Central Counterparty Regulation; whereas, on a market basis in the Markets and Procedures under special headings; and these arrangements are available on Takas Istanbul website for public access.

Information is provided on the website about issues regarding that; if no designation for the transferee member is made beforehand or even if it was made, if the porting is failed to be conducted within 24-hours, the positions and collateral may be subject to default management actions; it is extremely important for the customers to closely monitor the positions and collateral held in their name in the accounts associated with the member at Takas Istanbul by making use of the available remote access facility; whether or not the member has fully deposited the collateral of its members to the customer accounts at Takas Istanbul is not under the control of Takas Istanbul; Takas Istanbul blocks the collateral deposited by the member to the customer accounts only up to the portion corresponding to the risk amount; Takas Istanbul determines the CCP members by only taking account of their capacity to fulfill their financial and operational obligations against Takas Istanbul and collateralizes the risks that might arise; the capacity of the CCP members to fulfill their obligations against their customers or other people or entities is not monitored by Takas Istanbul; Takas Istanbul is not liable for the CCP members' obligations against their customers; and since the legal correspondent of Takas Istanbul is the members, it may not be legally possible for Takas Istanbul to make direct payment to the customers and/or to transact directly with the requests of the customers.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 14:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul has the rules and procedures that enable the segregation and portability of the positions of the CCP members' customers and the collateral associated with these positions.

Principle 15: General business risk

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

Key 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.*

Key considerations

15.1. 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.

Takas Istanbul budgets its income and expenses by also taking account of the trading volume forecasts of Borsa Istanbul to which it offers clearing & settlement and CCP service; and the operations are continued with a profitability that would provide each year to the shareholders a return on equity at a level higher than the inflation and risk-free interest rate. The income and expense realizations and the deviations from the budget are rigorously evaluated in the monthly Asset and Liability Committee meetings; and the necessary actions are taken to not to stay below the income targets and above the expense targets.

In the Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles, “the general business risk” is defined as “adversities which may occur in Takas Istanbul

income-expense balance depending on the CCP activities due to the unforeseeable business conditions”.

Takas Istanbul allocates a specific amount of reserve as internal capital to support the uninterrupted continuation of its operations in case of occurrence of CCP business risks. However; the resource amount that can be used to fund the CCP operational expenses in case of occurrence of general business risks is not under any circumstances limited to the allocated internal capital amount. The internal capital allocation is made in line with Articles 2 and 5 of the EMIR Supplementing Regulation (EU) No 152/2013 of the European Union and in a manner not to be less than 75% of the last one year operational expenses of the CCP services, as the provision for general business risk and recovery and orderly wind-down. In the calculation of capital to be allocated to the CCP covered risks, adding the provision for general business risk and restructuring risk to the minimum capital obligation including the credit, market and operational risks has also been stipulated in Article 39 of the CCP Regulation.

15.2. 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.

Takas Istanbul’s liquidity and liquidity risk management frameworks are explained in a comprehensive manner in Principle 7. In the Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles, it is exclusively stipulated that liquid assets shall be held against the capital set aside for the provision for general business risk and recovery cost. The amount of such provision is determined by taking account of CPMI–IOSCO Principles European Union norms. The provision for general business risk corresponds to 3 months and the provision for recovery and orderly wind-down corresponds to 6 months of CCP operational service expenses.

15.3. 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.

Takas Istanbul has a recovery plan approved by the Board of Directors. In addition, winding down of Takas Istanbul’s CCP activities is exclusively stipulated in Article 26 of Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles. In the said Article, it is stated that;

- If the CCP service provided by Takas Istanbul is terminated for any reason, the existing positions and collateral shall be ported to another institution that may be commissioned as a central counterparty by the Capital Markets Board in accordance with the legislation or Takas

Istanbul shall continue, if deemed appropriate by the Capital Markets Board, its clearing and settlement and collateral management services without acting as a central counterparty,

- In case of occurrence of any condition which would prevent Takas Istanbul from continuing its clearing and settlement or central counterparty services and the positions and collateral cannot be ported to another institution, then the positions and collateral shall be liquidated in accordance with the principles to be set forth by the Capital Markets Board.

As the provision for recovery and orderly wind-down (termination of business), Takas Istanbul holds internal capital equal to 6 months of CCP operational service expenses. However; the resource amount that can be used in such a situation is not under any circumstances limited to the allocated internal capital amount.

Although there is no requisition in the banking capital adequacy legislation to set aside capital for the general business risk or recovery risk, the provision for CCP business risk and general business risk and recovery and orderly wind-down is set aside during the Internal Capital Adequacy Assessment Process (ICAAP) carried out in accordance with the banking legislation. Further to their approval by Takas Istanbul Board of Directors, the ICAAP results are submitted to the Banking Regulation and Supervision Agency, and upon BRSA's approval for the ICAAP results, the provision allocated in accordance with the ICAAP for CCP business risk and recovery and orderly wind-down becomes a formal element of Takas Istanbul risk-based capital adequacy. Takas Istanbul tests its general capital adequacy under a wide range of stress scenarios and preparations are made for the worst-case scenario.

Using the collateral and guarantee fund contribution amounts included in the CCP default management resources for any purpose other than default management is forbidden by law. Thus, the said resources cannot be used to cover the general business risk losses or recovery and orderly wind-down (termination of business) costs.

15.4. 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.

In the Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles, it is exclusively stipulated that liquid assets shall be held against the capital set aside for the provision for general business risk and recovery cost. The provision for general business risk is at a level to cover 3 months of CCP operational service expenses and meets the minimum norms. However, the capital and its liquid resources that can be used by Takas Istanbul to cover the general business risk losses are not under any circumstances limited to such amount. As explained (in 15.3) above, the provision for CCP business risk and recovery and orderly wind-down allocated during the Internal Capital Adequacy Assessment Process becomes a formal element of Takas Istanbul risk-based capital adequacy. Takas Istanbul tests its general capital adequacy under a wide range of stress scenarios and preparations are made for the worst-case scenario.

15.5. 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.

In capital planning, Takas Istanbul acts in accordance with Takas Istanbul Internal Capital Adequacy Assessment Process Regulation and Takas Istanbul Recovery Plan approved by the Board of Directors. Capital increase is considered as one of the actions to be resorted when required; and although it is envisaged that the capital support to be needed in terms of the shareholding structure can easily be obtained, Takas Istanbul endeavors to minimize the likelihood of encountering with any capital increase requirement under difficult conditions by establishing the capital it may need under stressed conditions in the normal conditions. Making the capital increase decision when necessary is under the authority of the General Assembly (the shareholders), and Takas Istanbul Board of Directors can call the General Assembly for an extraordinary meeting.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 15:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul has defined the general business risk related to the CCP services, and has made the necessary arrangements to hold sufficient amount of liquid assets funded by equity to cover the potential general business losses.

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 instruments with minimal credit, market, and liquidity risks.

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 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.*

Key considerations

16.1. 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.

Cash and non-cash collateral and guarantee fund contribution amounts delivered to Takas Istanbul by the CCP members are taken under protection with Article 73/2 of the Capital Markets Law No. 6362. The said collateral is being protected from the bankruptcy, liquidation and the proceedings of the creditors of Takas Istanbul as well as the bankruptcy, liquidation and the proceedings of the creditors of the banks to which they are transferred by Takas Istanbul for interest accrual purposes or the depository institutions where they are safe-kept.

In addition to the legal protection, Takas Istanbul places the cash collateral and guarantee fund contribution amounts of the participants for interest accrual purposes to the accounts it has exclusively opened at the commercial banks whose credit default risk and risk of loss is regarded as close to zero, within the limits it has allocated to these banks by analyzing their creditworthiness. The limit allocations made in favor of the banks domiciled abroad are also made based on the international credit ratings.

Takas Istanbul holds the non-cash Turkish Lira collateral of the participants in the accounts it has opened at the Turkish central securities depository - CRA and holds their non-cash foreign currency collateral in the accounts it has opened at the international clearing and custody institutions/ global depository agencies.

With its 64% stake, Takas Istanbul is the major shareholder of the Central Registry Agency in which the Turkish Lira securities are safe-kept, and it has two representatives in its Board of Directors. The Central Registry Agency is a financial market infrastructure authorized as a central depository agency by the Capital Markets Boards and subject to the public supervision and oversight. The safekeeping

procedure of the CRA and its business continuity practices are closely monitored; and the relevant certificates are obtained pursuant to the compliance with the international standards. Accordingly; CRA employs ISO 31000 risk management system in a compatible manner with ISO 27001 information security management systems and ISO 22301 business continuity management system certificates. In addition, the CRA has also developed recovery plans intending to manage the potential financial problems under the assumption that unexpected sizeable risks may occur, in accordance with the legislation for the payment and securities settlement systems.

Takas Istanbul Board of Directors allocates custody limits to the institutions where the foreign currency denominated securities will be safe-kept, by taking the international credit ratings as the base. In order for the non-cash collateral and guarantee fund contribution amounts of the CCP markets to be safe-kept in the depository institutions domiciled abroad, it must be verified that the non-cash assets are being protected from the bankruptcy or liquidation of the depository institution as well as the proceedings of the creditors of that depository institution. In the present situation, Takas Istanbul's major global depository correspondents are Euroclear Bank S.A. /N.V. located at Brussels, Belgium and Citibank N.A. located at London, United Kingdom, which operate at the international norms. The safekeeping procedures of these entities and their business continuity policies are monitored in a periodic manner and Takas Istanbul's global custody risk is reviewed.

16.2. An FMI should have prompt access to its assets and the assets provided by participants, when required.

Takas Istanbul's disposition and usage rights on the cash and non-cash assets delivered by its members as collateral and guarantee fund contribution amount are stipulated in the third paragraph of Article 79 of the Law No. 6362. Pursuant to the said paragraph, the rights and powers of the central settlement and clearing institution on the values of assets it has received as collateral due to the transactions it performs as a clearing & settlement and central counterparty institution cannot be limited in any way. Devoting time for composition to the member institution or the collateral provider, approval of its composition, composition after bankruptcy or entering into composition process by abandoning its assets, restructuring by an arrangement, its bankruptcy, postponement of its bankruptcy, or the proceeding procedures under the Execution and Bankruptcy Law No. 2004 or the relevant provisions of this Law regarding gradual liquidation can under no circumstances limit the relevant central clearing and settlement institution to use its rights and powers on such collateral.

Takas Istanbul monitors the entities (the Central Registry Agency, global depository agencies) from whom it receives safekeeping service, through the system-based and technological integration it has established, and is able to track instantaneously its own and the participant's assets and enters the relevant instructions. As part of the business continuity policies; Takas Istanbul prevents occurrence of access interruption by creating "B" plans against any system-based/technological etc. disruption, and regularly conducts the simulation studies related to the tests.

In Turkey, collateral and guarantee fund contribution amounts accruing interest at the commercial banks whose credit default risk and risk of loss is regarded as close to zero are held in the O/N term deposit accounts and are recalled to Takas Istanbul's accounts at the CBRT each business day and re-invested. Assets held at the CRA can also be instantly accessed.

It is also possible to access within the same business day to the foreign currency denominated accounts and assets held at the banks or depository institutions located abroad.

16.3. An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.

Turkish Lira denominated securities accepted as collateral and guarantee fund contribution amount by Takas Istanbul are safe-kept in the Central Registry Agency as being the Turkey's authorized central depository institution and a subsidiary of Takas Istanbul. Takas Istanbul works with the depository institutions domiciled abroad in accordance with the custody limits allocated by Takas Istanbul Board of Directors by taking account of the international credit ratings.

The credibility and the placement limits of the domestic banks in which the cash collateral and guarantee fund contribution amounts are invested are reviewed twice a year through Takas Istanbul internal credit assessment system; and the collateral and guarantee fund contribution amounts of the CCP markets are accrued interest in the commercial banks whose credit default risk and risk of loss is regarded as close to zero.

16.4. An FMI's investment strategy should be consistent with 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.

While using its own capital and cash facilities in accordance with the investment strategy approved by the Board of Directors, Takas Istanbul aims to minimize the credit, market and liquidity risks.

Accordingly; among the debt instruments, investment can only be made into the securities issued by the Republic of Turkey Undersecretariat of Treasury. Assets issued by the Treasury can be provided to the CBRT as collateral for borrowing purposes and they can be converted into cash with low costs, where necessary.

Takas Istanbul can invest its cash funds into the reverse repo transactions against the debt instruments issued by the Republic of Turkey Undersecretariat of Treasury.

Takas Istanbul makes no investment into the share certificates or debt instruments issued by its members, the private sector debt securities and share certificates, and the share certificates and debt instruments issued by itself, its subsidiaries or major shareholder.

Takas Istanbul can only conduct derivative transactions for hedging purposes under the CCP default management and holds no short or long foreign currency position based on speculative incentives.

Takas Istanbul can invest its cash resources into the domestic banks in accordance with the credit limits it has allocated by using the internal credit rating system.

Takas Istanbul can invest its foreign currency denominated cash resources into the banks domiciled abroad in accordance with the credit limits it has allocated by using the independent credit ratings.

The main aspects of Takas Istanbul's above-summarized investment strategy are available for the members on its website.

Takas Istanbul restricts all its banking, CCP and non-CCP related risks arising from any counterparty with a single upper limit by taking account of the credit rating results and the equity of the counterparty, and the upper limits are reviewed at least two times a year. The aggregate of all credit, risk, trade, collateral and custody limits allocated in favor of a single counterparty due to the banking, CCP and non-CCP services cannot exceed the upper limit.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 16:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul safeguards its and its participants' cash and non-cash assets at the depository institutions in a secure manner or invests them by using the instruments with minimal credit, market, and liquidity risks. There is not any legal and operational obstacle which may limit or delay Takas Istanbul's prompt access to these assets, when required.

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 major disruption.

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.*

Key considerations

17.1. An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.

In identifying the sources of operational risks to which Takas Istanbul may be exposed, the general Risk Management Regulation, Operational Risk Management Procedure and the IT Risk Management Procedure prepared basically in accordance with the banking legislation are used. The Risk Management Regulation is under the responsibility of the Risk Management Team reporting to the Supervision Committee within the body of the Board of Directors; whereas the IT Risk Management Procedure is under the responsibility of the Information Security, IT Compliance and Risk Management Team reporting to the Assistant General Manager in charge of Information

Technologies.

Takas Istanbul's operational risk definition is given in the general Risk Management Regulation and it covers the risks that might be posed by internal as well as external sources. In the Regulation, the probability of loss resulting from inadequate or failed internal processes, people and systems or from external events, which also includes the legal risk, is defined as the operational risk. Thus;

- inadequate or failed internal processes,
- people (personnel mistakes, misconduct, etc.,),
- systems (technological infrastructure and IT risks),
- external events (terrorism, disasters, cyber-attacks, etc.),
- and legal risks

are identified as the sources of operational risk. Legal risks define; the probability of loss that might be exposed as a result of the misinterpretation of or incomplete knowledge about the law or regulations, the unforeseeable amendments in the Law or regulations, the unenforceability of the contracts due to the legal barriers.

Identifying and analyzing the risks are addressed as the key aspects to ensure efficiency in the management of operational risk. Takas Istanbul's risk analysis process is carried out by taking account of the internal factors such as the Bank's structure, characteristics of its activities, quality of its workforce, organizational revisions and employee turnover rate, etc. as well as the external factors such as the environmental factors affecting in a broader frame and developments in the industry and technology, etc. Inadequacies that might occur in defining the risks, control points and the procedures regarding their management and restriction, the defects in controlling the system and flows and monitoring the employees, and the deficiencies in the management as a more general term are considered among the internal sources causing the operational risk. The external sources falling into this scope include events such as failures in the services of the critical service providers or the auxiliary services as well as the natural disasters, terrorism, epidemics, etc. that might affect a wide area. Internal and external sources of the operational risk may cause many operational errors such as delays or faults in message processing, lack of communication, service breakdown or disruption, fraudulent activities that might be conducted by the employees and disclosure of confidential documents to the unauthorized parties, etc.

Takas Istanbul owns an Operational Risk Database where it tracks the operational risks it has defined as well as the losses it has exposed in relation to such risks. Takas Istanbul inserts the operational risks it has defined into the Operational Risk Database, whereas inserts the incurred operational risk losses reflected as expense in the accounting records into the Operational Risk Loss Database. In the annually updated Operational Risk Database, the process and subprocess-based risks are defined by the process owners in accordance with the workshops carried out with the process owners under the coordination of the Risk Management Team by taking Takas Istanbul Process Manual as the base. Furthermore, in case of identification in the control tests conducted by the Internal Audit Team of any risk which has not yet been defined to the operational risk database, the Risk Management Team is informed thereof and the update of the database is facilitated.

Internal Audit Team, on the other hand, contributes to the process of identification of operational risks by way of defining the risks to which the Bank is exposed due to the activities falling into the scope during each audit task, determining the key controls with respect to such risks and testing the design and operation of the key controls.

As indicated at the beginning, IT Risk Management Procedure is also used in defining the sources of operational risks. According to this procedure, the information systems-related risks are compiled in the created database and updated in a periodic manner. Whether the sources of these risks are internal or external is determined in the workshops organized by the Information Security, IT Compliance and Risk Management Team and other IT units. The relevant principles and procedures are maintained in an environment open to in-house sharing and risks and related control steps covered in the risk assessment workshops are updated in the Operational Risk Database relating to the Information Technology risks are managed through an automation called QDMS which has been developed by the contributions of the IT units during the course of the IT risk workshops.

Sources of the risks defined within the scope of the Information Technology Security may be listed as; hackers, earthquake, fire, theft, personnel, terrorism, sabotage, members, brokerage firms, interoperated entities (the Central Registry Agency, Borsa Istanbul).

Risk-verifying actions are carried out at two phases over the IT network to minimize the operational risks arising from the Takas Istanbul system users. Besides this; all risk-prone movements are maintained in the log folders on the Bank IT network on a date, transaction and user basis.

When the amendments in the implementation principles are considered, none of the revisions to be affected thereof are transmitted to the real environment so long as they are tested by the IT system development personnel and the employees of the relevant department and concluded successfully.

In addition, the IT regulation, IT risk management procedure and the information security policies are created by taking the COBIT (Control Objectives for Information and Related Technologies) document as the base, and the relevant announcements published by the BRSA are also taken into consideration in defining the IT-originated operational risks. Takas Istanbul has a high maturity level in the COBIT audits.

In the business continuity and information security, Takas Istanbul targets the international standards and it has ISO 27001 (Information Security Management Systems) and ISO 22301 (Business Continuity Management System) certificates. Thus; the entire infrastructure required by these certificates has been provided both legislative and in physical terms.

Due to the fact that any stoppage which might be experienced in the services offered by Takas Istanbul as a matter of its activities is of the nature that could affect all capital markets, particular importance is attributed to the “business continuity risks” and these risks are kept under control through efficient risk management activities. In this context;

- execution of the emergency tests, establishment of a secondary data center (emergency center), preparing and updating the Business Continuity Regulation, Business Continuity Plan and Business Continuity Procedure, conducting the business impact analysis,
- establishment of the business flows to facilitate the continuity of the corporate identity, preparation of Takas Istanbul process manual and identifying the process owners/responsible parties of the processes, monitoring the process and subprocess-based risks in the operational risk database and their use in designating routine control and audit periods of these risks by the Internal Control and Compliance Team and the Internal Audit Team have been ensured.

In addition, information technology systems and business continuity are exclusively stipulated in the CCP Risk Management Regulation approved by Takas Istanbul Board of Directors. Accordingly;

- Takas Istanbul's information technology systems for the CCP activities must be efficient and reliable. The information processing capacity of these systems must have adequate capacity to ensure continuation of the CCP activities in an efficient and reliable manner. The information technology systems are designed by taking the internationally accepted technical standards and the best practices into consideration.
- Takas Istanbul's business continuity and emergency action plan for the CCP services aims to recover the entire operations at the moment of interruption. The plan encompasses the use of an alternative center and is designed in a manner to ensure that the operations can resume within two hours following the failure of the critical information technology systems.

Operational risk management includes the identification of risks to which the bank may be exposed, measuring the impacts of these risks, continuous monitoring of the risk values and the capital requirements thereof to ensure that an efficient planning and monitoring program is in force, mitigating and controlling the amount of value-at-risk and the steps to be followed in the reporting to be made to the Board of Directors and the senior management accordingly. Takas Istanbul's operational risk threshold value (the capital requirement of the Bank for operational risk) is calculated by using the Key Indicator Method. This value is included in the capital adequacy ratio calculations and reported to the BRSA on an annual basis.

In fact, the operational risks to which Takas Istanbul has been exposed/may be exposed are taken under coverage to a great extent through the insurance policies being purchased. In this context; electronic equipment and machinery breakdown insurance, fire and theft insurance, employers' financial liability insurance, personal accident insurance, third party financial liability insurance, cash in transit insurance, private security financial liability insurance, auto insurance, traffic insurance and comprehensive crime insurance policies have been purchased by our Bank. In addition, through the "Comprehensive Insurance Policy for Financial Institutions" jointly purchased by our Bank, BİAŞ and CRA, the theft risks that may occur due to an asset lost including transport and erroneous transfer, breach of confidence, damage risk to the office and contents, threats of cyber-attack and physical attack to people and assets, forgery, counterfeit document and counterfeit money risks, computer and telephone crimes and data protection risks are taken under coverage.

To ensure proper functioning of the risks controls; Takas Istanbul implements efficient management

processes in the establishment of operational standards, principles for performance measurement and evaluation, and effective internal control practices such as correcting the deficiencies, etc. The general practices regarding the efficient management of operational risk are based on three lines of defense: business line management, independent and corporate operational risk management functions and independent assessment. The structure and operations of these three lines of defense may vary according to the product diversity of the Bank, its activities, processes and systems, the size of the bank and its risk management approach. In addition, the systems, policies, processes and controls are established by taking account of the international, national and sector-based operational risk management standards.

Besides these, to mitigate the effects of high employee turnover rate and key personnel risk, Takas Istanbul has established effective human resources policies on issues regarding the employment of qualified personnel, their training and maintenance of the established quality.

Takas Istanbul's human resources policies have been established by taking account of the operational risks. By this way, a secure structure has been established on points to access well-trained and talented employees in addition to technical and other resources and use them in a beneficial manner. These practices enable all essential systems to function in a secure and complete manner under all conditions including the procurement of external services. To ensure secure and continuous functioning of the system, adequate number of qualified personnel is employed and it is ensured that they follow the operational risk management procedures under normal and extreme conditions.

In accordance with its human resources development policy, Takas Istanbul determines a wages policy by considering the qualifications of its employees, their experiences and expertise as well as the sector averages. In the Bank, the financial rights of the employees are reviewed from time to time and renewed; and they are updated by taking account not only the economic and sectoral developments but the personal improvements as well. By this way, comprehensive training facilities and incentives which would increase the satisfaction of the employees and their professional orientation are provided, and it is intended to make them build up efforts to gain occupational competence and personal improvement. In addition, workshops and trainings organized by commercial and non-commercial entities and in-house training programs prepared by Takas Istanbul are implemented. Participation of the employees and their continuation to the post graduate (master's degree, PhD) and certificate programs to develop their academic and professional skills are encouraged. Performance analyses conducted by the managers are implemented in a manner to include the productivity and work commitment factors and they directly affect the career of employees and their rights.

The impacts of high employee turnover rate and key personnel risk as well as other human resources-based risks are mitigated by clearly defined procedures, a double signature requisite for important issues, regular trainings, restricted access to the information and systems, segregation of duties, a proper audit trace, mandatory leaves and the culture established for reporting. In addition, these procedures and above-cited issues also enhance the corporate loyalty.

On the other hand, the channels for informing the Internal Audit and/or Internal Control and Compliance Team about any problem, suspicious transaction or irregularity that might happen in the

Bank are laid down in the procedure. In addition, the implementation screen authorizations of the employees are reviewed in a periodic manner. Moreover, in the audits it conducts, the Internal Audit Team also determines the controls established to prevent the misconduct risks and corruption and is attentive to include them into the audit scope as far as possible, performs control tests to detect any breach of segregation of duties which might lead to misconduct, examines the compatibility of the powers granted to the personnel with the minimum authorizations required to execute the work, reviews the controls established for the information classified as public, and investigates the irregularity alerts received from the warning line designed to make anonymous warns also possible.

Operational risk management develops overtime and the business environment is continuously changing; hence, Takas Istanbul's operational risk management mechanisms ensure the policies, processes and systems established in this context to have adequate soundness. The internal audit scope independently verifies that the risk management framework has been designed properly and is managed in an efficient manner.

The basic elements of Takas Istanbul's operational risks management framework are made subject to audit in a periodic manner and when deemed necessary. In addition to the periodic audit, external audit service is also received if it is deemed necessary. In line with the developing nature of the operational risk management, the operational targets are also reviewed on a routine basis to ensure execution of technological and business development initiatives.

Change Management Processes provide the necessary mechanism on issues regarding the preparation, approval, monitoring, testing and introduction of all changes to be integrated into the system. As part of the policies and procedures, the project management processes also reduce the risks, especially in the large projects, for occurrence of unintentional errors that may arise from issues such as improvement, development or revision of the Bank's service processes and might have an impact on current activities or those to be implemented in future. These policies and procedures provide guidance particularly for the management, documentation, governance, and testing and communication of the projects, independently of the accommodation of the projects from external resources or with internal resources. Change Management Processes are used for the management of changes, and when these changes have to be introduced during the day, the approval of the relevant assistant general manager is required. In addition, the impact, scope and risk assessments of these changes are documented by means of the change records. Depending on these assessments, the necessary changes are submitted to the approval of managers at different levels. Additionally, the tests relating to the changes within the scope of the system, and the procedures regarding the database changes and the library management system source-code data are also defined.

17.2. 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.

Establishment of the operational risk management process, approving and reviewing the policies and procedures regarding the operational risk management, designating and reviewing the operational risk appetite, operational risk limit and signal values are under the responsibility of the Board of Directors.

At Takas Istanbul, a triple defense line approach consisting of activity line management, central operational risk management function and independent review is used in the operational risk management. In the activity line management, the operational risks arising at each unit from the products and services offered and the processes, human resources and systems used are identified and the senior management is informed thereof and taking the appropriate actions is facilitated. The central operational risk management function is ensured by way of segregating the roles and responsibilities and making the processes and functions reviewed by those other than the operational units executing them. Independent review process, on the other hand, consists of evaluating the operational risk management framework in all its aspects. As part of the triple defense line of the operational risk management, all units are responsible for the activity line management, the Risk Management Team and the Internal Control and Compliance Team are responsible for the operational risk management function, and the Internal Audit Team is responsible for the independent audit process. The Board of Directors of our Bank is responsible for the establishment, approval and regular review of the operational risk management framework; and the senior management is responsible for the execution and maintenance of the operational risk management framework in a consistent and efficient manner in all activities, in a compatible manner with the Bank's risk appetite and capacity.

The powers, roles and responsibilities within the scope of the operational risk management system are performed by the Senior Management in accordance with the legislation, and by all units of the Bank in line with the regulations, directives and procedures and business flows of these units.

Adaptation of the operational risk management policies and implementing procedures to the changing conditions is imperative. The Board of Directors regularly reviews the adequacy of these policies and implementing procedures and makes the necessary revisions. The operational risk management framework and the methodologies, methods or models being used are reviewed according to the changes in the risk profile and risk appetite of the Bank and the dynamics of the new products and services, processes, systems and external factors. The operational risk appetite of the Bank is reviewed at least once a year, and the operational risk limit and signal value are reviewed according to the changes in the market conditions and the Bank's strategy. The Operational Risk Database is reviewed by the activity line managers and the Risk Management Team at least once a year; and the Operational Risk Loss Database is reviewed by the Risk Management Team at least once a month.

Information Security and IT Risk Management Team conducts periodic assessments, from the IT perspective, in the areas such as network, database, operating system, applications and services, etc. where "C-level" reporting is made, and audits them in a periodic manner. In addition; independent penetration test processes and COBIT independent compliance audits which are monitored through the action plans and reported to the BRSA are also implemented.

Pursuant to Takas Istanbul Internal Audit Regulation, the Internal Audit Team conducts its audits based on the risk assessments it will make as of each year. In the risk assessments to be made, the areas to be given priority in the audit studies, the details to be taken into account and the frequency of audit are determined by taking the risks to which the Bank is exposed and the controls thereof into consideration. The audit studies to be conducted by the Internal Audit Team during the year are

carried out in accordance with the internal audit plan. The internal audit plan prepared by the manager of the Internal Audit Team by also obtaining the opinion of the senior management is put into force following the affirmative consent of the Supervision Committee and upon approval of the Board of Directors. Material revisions or updates to be made in the internal audit plan during the year as a result of the significant changes occurring with respect to the risks being exposed or controls being established are implemented by the affirmative consent of the Supervision Committee and approval of the Board of Directors. In addition, the Audit Team may also conduct unscheduled audit studies for significant changes occurred in relation to the risks being exposed or controls being established by employing the precautionary reserves, provided that they do not lead to any material restriction in the scope and calendar of the scheduled audit studies. The Bank's periodic and risk-based internal audit activities cover the operations relating to the preparation and enforcement of the internal audit plan, its execution through the work programs, reporting their results to the Supervision Committee, and to the Board of Directors via the Supervision Committee, and monitoring the measures taken by the relevant unit directorates in accordance with the audit reports. Defining the risk exposure and the internal control environment is made by assessing the risks defined in the operational risk database for the services, processes and systems included in the audit scope and evaluating the control activities designated for the said services, processes and systems in the regulations, procedures and business flows.

An Internal Control Program is also prepared on an annual basis, and submitted to the Board of Directors via the Supervision Committee. In preparing the program, meetings are held with the service owners and the controls to be included in the second line of defense are jointly determined. In determining these secondary controls; having a relatively low level of automation applied in the relevant sub-processes, being more vulnerable to manual intervention in performing the transactions, affecting the accuracy and reliability of the financial statements, and ensuring Takas Istanbul to not being exposed to any legal sanction are the criteria that are particularly taken into account.

On the other hand, Takas Istanbul is subject to the Capital Market Law No. 6362 and the supervision of the Capital Markets Board by virtue of holding a central clearing and settlement institution license, and to the Banking Law No. 5411 and the supervision of the Banking Regulation and Supervision Agency (BRSA) by virtue of holding an investment banking license, and to the Law No. 6493 on Payment and Securities Settlement Systems and the supervision of the Central Bank of the Republic of Turkey by virtue of operating a securities settlement system, and to the supervision of the Financial Crimes Investigation Board (MASAK) in accordance with the legislation on the "Prevention of Laundering Proceeds of Crime and Financing of Terrorism", and to the Undersecretariat of Treasury in accordance with the Private Pension Savings and Investment System Law No. 4632 by virtue of its status as a depository. The independent external audit reviews the Bank's financial statements as well as the internal controls established on the business processes and the IT processes. In addition, Takas Istanbul has independent penetration test processes, COBIT (Control Objectives for Information and Related Technology) independent compliance audits and independent support service procurement applications which are monitored through the action plans and reported to the BRSA. Moreover, our policies and practices for the business continuity are subject to independent audit in accordance with ISO 22301 standards; and our information security policies and practices are subject to independent audit pursuant to ISO 27001 standards.

17.3. An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.

Takas Istanbul's vision and mission are defined respectively as *"To be a trustworthy, effective and innovative institution which provides clearing & settlement, banking and central risk management services at global quality standards, as the institution of choice in international markets"* and *"Contribute to the development of markets with its reliable and effective post-trade services"*. Towards achieving the defined vision and mission; a Strategic Plan covering a 3-year period is prepared based upon the expectations on the capital markets and the clearing & settlement and custody market.

This Strategic Plan basically includes Bank's 3 year strategic targets (financial and business targets) and initiatives of the Takas Istanbul's business model (its customers, products, organization principles, and brand management and information technologies strategy). In this context, Takas Istanbul has set 8 key strategic targets under the main sections of financial, customer, process and organization/human resources and detailed the activities over the initiatives for achieving each strategic target. Qualitative and quantitative metrics have been set for the targets and initiatives included in the Strategic Plan, and the sub-metrics lowering down to the activity level have been set for achieving these initiatives. The designated metrics are monitored and assessed by the senior management of the Bank and the necessary actions are taken. "Trust", as one of the values of the Bank, is defined as *"adhering to the principle of trustworthiness in Takas Istanbul's relations with its customers, shareholders, stakeholders and employees; and executing services in a timely and accurate manner according to providence of clear, understandable and correct information within the concept of mutual trust"*. Accordingly, member service satisfaction survey is conducted each year, and the evaluations of our members are obtained about the services of our Bank through in-depth questions. The metric of service satisfaction level set for 2015 is min. 85%, and the next period's metric is set as maximum (previously designated metric; previous measurement result); hence, continuous improvement is targeted.

To provide reliable and effective post-trade services, a threefold internal control system is operated at the Bank. The business processes enabling execution of the operational activities are mainly designed in accordance with the principle of segregation of duties. On the other hand, secondary level control processes are performed in general time periods designated by the teams undertaking the risk management, internal control, IT control and central risk management functions. The efficiency of the controls operated in the primary and secondary levels with respect to their design and operation is handled by the internal audit team performing the third level controls and whether or not the internal control system is effective, sufficient and compatible is examined. In addition, the internal control environment established at the Bank is reviewed regularly by the independent external audit teams and by the regulatory authorities in specific time periods. The independent external audit reviews the Bank's financial statements as well as the internal controls established on the business processes and the IT processes.

For the maintenance of the operational activities in an efficient and compatible manner, the job descriptions of each personnel, the business flows and the business impact analyses are documented in writing at the Bank. Furthermore, the policies and procedures for the execution of the operational activities are also put in writing.

Established to ensure the operational activities to be provided in an effective and reliable manner, the business continuity policies and practices are compatible with ISO 22301 and the information security policies and practices are compatible with ISO 27001, and they have been certificated as a result of the independent audits.

17.4. An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.

Regarding the service provided currently and desired to be provided by the business units at Takas Istanbul, the capacity plans for ensuring the capacity and performance needs in a cost effective way are made by taking into consideration the Takas Istanbul's needs for today and the future in consistent with the existing IT infrastructure components. Optimum capacity planning is provided so as to estimate the future capacity via trend analysis.

The performance and the outputs of IT services and supporting IT components are monitored in real time basis and reported on weekly basis. According to the data obtained, necessary adjustments are made for using the resources effectively and IT resources are provided in order to reach the service level agreement values within the plans.

Takas Istanbul measures the testing capacity and the system's loading capacity on a project basis through different testing tools (Apache JMeter, Fiddler, etc.) before the projects are transferred to the real environment, and makes them subject to observation and audit routinely.

The system's capacity is continuously monitored by the service owners and the support groups. Capacity enhancement requests can be fulfilled in accordance with the designated specific limits by the service owners, when necessary. On the other hand, the infrastructure service owners place requests on an annual basis to the IT service owners in line with their capacity requirements in order to plan their future capacity needs.

The monitoring and measuring the limited resources under the IT infrastructure and recording, examining and reporting of these data have been established.

17.5. An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.

Takas Istanbul operates ISO 27001 Information Security Management System and accordingly, it has ISO 27001:2013 certification.

As part of the Regulation on Information Security Policy, many policies and procedures are operated at our Bank. Some of these procedures are:

- IT Risk Management Procedure,
- Information Security Physical and Environmental Access Procedure,
- Information Security Incident Management Procedure,
- Acceptable Use Policy.

Within the scope of the IT Risk Management Procedure and Operational Risk Management Procedure, IT-risks assessment is conducted on an annual basis. At the end of these assessments, an Operational Risk Management database is updated. Database includes the threats and weaknesses. The probability of occurrence and the impact of the risk are calculated based on these threats and weaknesses and the level of risk is then calculated over the impact and the probabilities; and approved actions are taken for the risks staying above the acceptable level of risk set by the Board of Directors of the Bank.

Assurance is provided with the audits conducted by the Internal Control Team and the Internal Audit Team for the information security, and with the independent audits, the information security management is audited in terms of the banking legislation. In all audit studies conducted by the Internal Audit Team for the information systems, the framework of the internationally accepted COBIT is taken as the basis. In addition, our Bank's information security policies and practices are prepared in a compatible manner with ISO 27001 standards and made subject to independent audit regularly in accordance with this standard. In line with the Internal Control Program and as part of the IT controls, general controls are performed under COBIT 4.1 and tests are conducted in the execution control areas. In addition, a member of the Internal Control and Compliance Team also serves as an internal investigator in the annual inspection studies conducted at the Bank in relation to ISO 27001 and ISO 22301 certifications.

17.6. 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.

Takas Istanbul Business Continuity Policy covers all procedures, business flows, business impact analyses and the business continuity management plan, service continuity and recovery plans and the improvement and development studies for the performance of the business continuity that have been defined in the "Business Continuity Regulation" approved by Takas Istanbul Board of Directors and prepared based on the "Regulation on Internal Systems of the Banks and Internal Capital Adequacy Assessment " published in the Official Gazette numbered 28337 and dated 28.06.2012, the "Communique on the Fundamental Principles for the Management of Information Systems in the Banks" published in the Official Gazette numbered 26643 and dated 14.09.2007, the "General Regulation on the Establishment and Operating Principles of Central Clearing and Settlement Institutions" published in the Official Gazette numbered 28662 and dated 30.05.2013, and the "Regulation on Emergency Situations in Business Places" published in the Official Gazette numbered 28681 and dated 18.06.2013 and by taking Takas Istanbul Strategic Plan, ISO 22301 and ISO 27001 Standards, COBIT and ITIL practices and CPMI-IOSCO principles as a reference.

The regulations, procedures, policies and plans created within the scope of the Business Continuity Management System (BCMS) are as follows:

- Business Continuity Regulation

- Business Continuity Procedure
- Business Continuity Management Plan
- Business Continuity Management Manual
- BCMS Incident Management System
- Emergency Central Transition Plan
- Service Recovery Plans
- Communication Plan

For purposes of registering the efficiency of Takas Istanbul BCMS activities and their conformity with the international standards, independent external audit activities have been conducted at our Bank by the BSI on November and December 2014 within the scope of the compliance with ISO 22301-Business Continuity Standard. As a result of the audit, Takas Istanbul has obtained ISO 22301 Certificate without any major or minor finding according to the BCMS's scope which is prescribed by Takas Istanbul and includes all critical services as well as the infrastructure services and assets supporting these services.

Relying on the fact that it will provide significant contribution and convenience to the execution of Takas Istanbul's business continuity activities as a management system in a manner to ensure continuity of the "plan, do, check, act" (PDCA) cycle, Takas Istanbul Management Application (TYS) has been developed entirely by Takas Istanbul Business Continuity process owners and managers based on the standards and practices on this subject. The program has been put into effect on November 20th, 2014. This program enables the service recovery plans to be automatically created, the employees to monitor the plans and their roles and responsibilities in these plans at any time, business continuity activities, tests and improvements of which they are being part to be monitored, as well as the formation of new records; and it produces enormous benefits with respect to the speed, convenience, integrity and accessibility issues in carrying out the BCMS.

The Emergency Data Center (EDC), which has the same capacity with Takas Istanbul's current main systems (production) and where data is synchronized on-line and simultaneously, is located at Ankara. Recovery strategies are defined in the recovery plans prepared for the critical processes, such as personnel rotation, receiving phone/written instructions, working with remote access, etc. to enable the processes to be carried out.

All information and requirements (personnel to be in charge, necessary minimum hardware and equipment) for Takas Istanbul Emergency Operations Center are defined in the recovery plans being created.

At Takas Istanbul, data is backed up simultaneously to different environments; accordingly, no data loss occurs.

The following tests and drills are conducted at least once a year:

- Emergency Test (by the participation of the employees, stakeholders and the relevant parties)
- Evacuation Drill
- Service Recovery Plans Walk-Through Test

Employees, stakeholders and relevant parties who serve in the processes within the scope of the scenario participate in the emergency tests being conducted; all employees and visitors who are present in the bank building on the day the evacuation drill is conducted participate in the drill; and again the employees, stakeholders and relevant parties who serve in the processes participate in the service recovery plans walk-through tests. These tests are conducted at least once a year.

BCMS awareness trainings are organized regularly for all employees of the Bank. Besides, related staff in are so far given first aid trainings, fire safety and intervention trainings, search and rescue trainings, and intervention on debris-earthquake-disaster preparedness trainings.

Practices such as keeping software and hardware used at Takas Istanbul readily available along with their alternatives, saving data simultaneously to different environments, keeping communication, energy, human resources and their substitutes available, business continuity and emergency planning, etc. allow managing the operational risks that may arise from the information systems in an efficient manner.

As elements of Takas Istanbul Business Continuity Management System, the business continuity plans have been established for all critical businesses and actual (IT) services and processes, which include the recovery team personnel, the MTPoD(maximum tolerable period of disruption)/RPO (recovery point objective)/RTO (recovery time objective) values, the critical service hours, the relevant parties, the continuity and recovery strategies and the recovery procedures (the recovery strategies designed for each specified continuity risk, the recovery and restoration activities and the criteria for their implementation). The recovery period target prescribed for the majority of designated critical processes is less than 2 hours.

As part of Takas Istanbul Business Continuity Management System, there is a Communication Plan regarding with whom, when, within what procedure, by whom, through which communication channel and in which content the communication will be made in normal and extreme conditions.

For the outsourced services, Takas Istanbul has service level agreements executed between the service providers and itself. The received services are monitored in accordance with these agreements and the performances of the service providers are measured by the periodically conducted assessments.

Takas Istanbul executes the business continuity arrangements in a manner to fully cover all of its critical processes, in tandem with the institutions to whom it is interdependent such as Borsa Istanbul, the Central Bank of the Republic of Turkey, the Central Registry Agency, EPİAŞ (Energy Markets Operation Company); and as in its own tests, it also participates in the business continuity tests of all these institutions. The assessment reports prepared for the conducted tests are shared and evaluated jointly with the participants, and improvement actions are planned for the issues that are deemed necessary.

17.7. 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.

Development of the key risk indicators set for the information technology risks (business continuity studies, IT Department's activities, reports related to the companies from whom our bank receives support service, vendor materiality analysis and performance evaluation results, compatibility of the internal services offered by the outsourcing companies and the IT teams of our Bank with the service level agreements, business interruptions, security threats against our Bank, call resolution periods, IT personnel-related statistics) is reported by the Risk Management Team to the Senior Management once every six months. Besides, the criticality levels of the vendors are determined by the Bank and the important vendors are identified. In addition, risk analysis reports and technical adequacy reports prepared for the support services are reported to the Senior Management as an attachment to the Supervision Committee Evaluation Report prepared once a year.

In addition, the critically important support service providers are periodically audited by the Internal Audit Team and the results are reported to the Board of Directors via the Supervision Committee.

A risk management framework is developed within the structure of our subsidiary Central Registry Agency to mitigate or eliminate the impact of threats and weaknesses on its assets and processes. The threats and vulnerabilities to which the entity may be exposed are analyzed and the risk values are calculated each year over an application software developed in accordance with this framework by taking the CCP risk management procedures as the base, and information is provided to its Board of Directors about the risks on the risk appetite of the entity, and the necessary risk management actions are taken. There also exist the physical assets damage insurance, crime insurance, professional liability insurance and management liability insurance to provide coverage against the risks to which the entity is exposed. Our Bank's greatest CRA-originated risk is to have disruption in our services and/or become unable to provide our services due to any stoppage in the CRA activities; and accordingly, the Business Continuity Management System certification studies carried out by the CRA in accordance with ISO 22301 standards to strengthen the uninterruptibility and reliability of its services have been completed. The entity has ISO 22301- Business Continuity Management Certification, and as part of the Business Continuity Management System (BCMS), it has created BCMS Objectives and Procedures, BCMS Policy, BCMS Competency Enhancement for Personnel, Business Impact Analysis, Risk Assessment, Business Continuity Strategy, Incident Management System, Business Continuity and Incident Management Plans, Business Continuity Tests, Internal Audit, Senior Management Review, Preventive and Corrective Actions and Continuous Process Improvement layers. In addition to these, Takas Istanbul-CRA Integration Project is prepared by the Information Technology Departments of our Bank to prevent business interruptions that might occur between the CRA and Takas Istanbul, and the infrastructure tests thereof are completed both by our Bank and the CRA.

In addition, through the "Comprehensive Insurance Policy for Financial Institutions" jointly purchased by our Bank, BİAŞ and CRA, the theft risks that may occur due to an asset lost including transport and erroneous transfer, breach of confidence, damage risk to the office and contents, threats of cyber-attack and physical attack to people and assets, forgery, counterfeit document and counterfeit money risks, computer and telephone crimes and data protection risks are taken under coverage. However, in the Operational Risk Loss Database of our Bank, there is no loss originated from any risk relating to the CRA and BİAŞ.

Furthermore, we put effort to have the parties to whom Takas Istanbul provides service or from whom it receives support as the primary stakeholder while rendering its services participate in the business continuity tests.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 17:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul identifies its internal and external sources of risk, and mitigate the potential impacts of these risks by using appropriate systems and controls. The systems are designed in a manner to provide a high degree of security and operational reliability and have adequate and scalable capacity. Business continuity management aims for timely recovery of operations and fulfillment of Takas Istanbul’s obligations, including in the event of a wide-scale or major disruption.

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.

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.*

Key considerations

18.1. 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.

Takas Istanbul employs an objective, transparent and risk-based assessment system in establishing membership for the markets and capital market instruments to which it offers central counterparty service.

The minimum conditions required to be met by the CCP members are listed in Article 7 of the Central Counterparty Regulation. Accordingly, in order to be a CCP member;

- 1) It is required to become a member of Takas Istanbul pursuant to the provisions of the Central Clearing and Settlement Regulation,
- 2) The authorization of trading on the markets or capital market instruments to which clearing and settlement or CCP service is provided by Takas Istanbul must not have been revoked due to any contradiction to the relevant legislation,
- 3) The agreements and/or letter of undertakings related to the CCP service, the contents of which is determined by Takas Istanbul, must have been signed and submitted to Takas Istanbul,
- 4) The information processing, risk management, internal control and internal audit mechanisms necessary to ensure continuity of the CCP service must have been developed and made operative,
- 5) The minimum equity capital to be determined by Takas Istanbul on a market or capital market instrument basis must be in place in order to become a party to the CCP services,
- 6) The financial strength must be at a level capable of fulfilling the commitments to Takas Istanbul in relation the markets or capital market instruments subject to the CCP services,

- 7) The additional conditions which may be stipulated according to the special characteristics of the markets or capital market instruments to which the CCP service will be provided must have been satisfied,
- 8) Other information and documents to be requested by Takas Istanbul must have been submitted.

In the process of application and admission to membership, there is not any discriminatory practice or restriction apart from differentiating the general and direct clearing membership (direct participation) or trading institution (indirect participation) conditions which can be made according to the type of brokerage authorization, level of equity and financial or technical adequacy owned in the relevant markets in accordance with the capital markets legislation.

18.2. 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.

The membership in the markets to which Takas Istanbul provides central counterparty service is executed in two ways as direct and general central counterparty clearing membership. Direct CCP members are authorized to conduct only their and/or their customers' clearing and settlement services. General CCP members, on the other hand, are also authorized to conduct the clearing and settlement transactions of the trading institutions apart from their and/or their clients' clearing and settlement transactions. The distinction between the membership types is made by taking account of the capital amount and the adequacy of the internal systems and technical infrastructure applied in the membership conditions and the results of the internal assessment financial analysis and intelligence studies conducted by Takas Istanbul. Conditions sought for each membership type and transition between membership types are referred to in the relevant market directives and are available on Takas Istanbul's website.

On the other hand, the brokerage firms applying for a CCP membership must have been authorized by the Capital Markets Board to engage in trade intermediation and custody in the relevant markets and/or capital market instruments. The Capital Markets Board authorizes the brokerage firms under three categories: "narrowly authorized", "partially authorized" and "broadly authorized"; and only partially and broadly authorized firms can engage in "trade intermediation and custody". For direct and/or general clearing membership, the "trade intermediation and custody authorization" is a must. The Capital Markets Boards determines the type of intermediation authorization by taking account of the requests of the brokerage firms and their equity amounts. Apart from that, the authorization of the brokerage firms with a bank status is restricted in some areas by the Capital Markets Board.

The conditions referred to in Article 7 of the CCP Regulation and sought for the institutions that may become a CCP member to Takas Istanbul, like;

- The authorization of trading on the markets or capital market instruments to which clearing and settlement or CCP service is provided by Takas Istanbul must not have been revoked due to any contradiction to the relevant legislation,

- The information processing, risk management, internal control and internal audit mechanisms necessary to ensure continuity of the CCP service must have been developed and made operative,
- The minimum equity capital to be determined by Takas Istanbul on a market or capital market instrument basis must be in place in order to become a party to the CCP services,
- The financial strength must be at a level capable of fulfilling the commitments to Takas Istanbul in relation the markets or capital market instruments subject to the CCP services,

observe the security of both the markets and the CCP members satisfying these conditions as well as of Takas Istanbul, and are considered fair. Among the membership conditions, there is not any condition restricting the access in an unfair and unjustified manner. The specific conditions that might be sought particularly for the markets to which CCP service is provided are explained in the relevant market directives.

Members in the same category can access to the CCP services in equal conditions within the risk limits allocated to them. The limits are determined by taking account of the internal credit rating results of the CCP members and their equity; and in case of any limit breach, enhanced collateral obligations are imposed. Thus, each CCP member's level of facing with enhanced collateral obligation differs on a risk basis. The limits of the members are reviewed two times a year in a regular manner.

18.3. 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.

The necessary conditions for membership are expected to persist after the establishment of the membership; and whether or not the criteria of having adequate capital and financial strength is continue to be met is controlled and analyzed at least two times a year, on June and December, through Internal Credit Rating and Assessment Process. Information used in the control and analysis must belong to the relevant period. In addition, Takas Istanbul Internal Audit Department examines on-site whether or not the CCP members continue to meet the membership conditions, particularly the internal control and internal audit mechanisms.

Restriction of the activities of the CCP members is stipulated in Article 14 of the CCP Regulation. As per this Article, activities of the members conducted as a central counterparty participant, whose operations have been restricted or suspended temporarily by the Capital Markets Board or the relevant public institutions/entities, are restricted by Takas Istanbul until any notice to the contrary is served to Takas Istanbul by the relevant entities. Again as per the same Article, if Takas Istanbul determines that the financial adequacy of any CCP member remains insufficient against the risks it assumes, the Board of Directors can restrict the activities of the said CCP member on the basis of the market or capital market instrument to which the CCP service is provided. In fact; Article 13 of the CCP Regulation stipulates that; if Takas Istanbul foresees any of their CCP members to be unable to partially or fully fulfill their obligations, it has to advise this situation immediately to the Capital Markets Board and other relevant public institutions and entities together with all substantiating information and documents containing its reasons thereof. Hence; in case of any emergency, it is not necessarily required to wait for the restriction decision of the Board of Directors.

However; use of the risk limits allocated by Takas Istanbul Board of Directors to the CCP members can be temporarily or permanently suspended in accordance with the authorization given by the Board of Directors to the Head Office in the Credits Regulation in case it is determined that the membership qualifications have been lost, the risks carried by the member are at a level exceeding its financial adequacy, occurrence of uncertainty about the activities of the member or when it is deemed necessary for any other reason; and the order transmission and position taking of the member can be blocked by coordinating it with the market operator, where necessary. Hence; during the time period to be elapsed until the Board of Directors makes a decision, it is possible for Takas Istanbul to react in a very rapid manner against the sudden adversities to be experienced.

Pursuant to Article 14 of the CCP Regulation, the CCP member whose activities are restricted can be granted a time period not exceeding six months by Takas Istanbul by taking account of the market rules and trading hours in order to facilitate removal of the insufficiencies on issues subject to the activity restriction; and if one or more of the conditions having caused the restriction of activities continue at the end of this time period, the Board of Directors shall be authorized to terminate the membership of the CCP member.

Termination of the CCP membership is stipulated in Article 15 of the CCP Regulation. Accordingly, the CCP membership terminates upon the resolution of Takas Istanbul Board of Directors to be made ex-officio or by the application of the member. The Board of Directors can ex-officio terminate the membership if Takas Istanbul determines that any condition of the CCP membership set forth in the CCP Regulation and other relevant arrangements has been lost or if Takas Istanbul determines that significantly important risks which may endanger the safe and uninterrupted operation of the CCP system due to failure to fulfill the obligations stipulated in the CCP Regulation or other relevant legislation have occurred. Even in case of the termination of the CCP membership, the obligations within the scope of the CCP Regulation and other relevant arrangements of the institution whose CCP membership is terminated against Takas Istanbul with regard to the transactions conducted until the date of the Board of Directors' resolution regarding the termination of membership shall continue. Hence, the measures for the orderly termination of the membership have been taken.

Pursuant to Article 14/5 of the CCP Regulation, it is not possible to make public disclosure about the CCP member whose activities have been restricted, without obtaining the approval of the Capital Markets Board and other relevant public institutions and entities. For public disclosure about the restriction of activities, it is required to obtain permission from the Capital Markets Board and, if the CCP member whose activities have been restricted is -for instance- a bank, from the BRSA. If the CCP membership is terminated upon request of the member, there exists no special arrangement in the CCP legislation about making public disclosure. However, in such a case, the membership lists are updated and the list of institutions whose CCP membership terminates for any reason is made publicly available on the website. If the CCP membership is terminated due to default, the issues relating to the announcement of the event of default as well as the developments to be experienced thereof shall be determined by the CCP Default Management Committee.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 18:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul has objective, risk-based, and publicly disclosed membership criteria which are applied in a fair manner.

Principle 19: Tiered participation arrangements

An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.

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.

Key considerations

19.1. 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.

Takas Istanbul's CCP arrangements stipulate the brokerage firms (trading institutions) which cannot become or does not wish to become a direct CCP member, can access to the CCP services in an indirect way by using the general clearing members. The general CCP membership conditions are much stronger than the direct CCP membership conditions, and it is envisaged that the financial and operational risks that may arise from the trading institutions shall be managed easily by the general CCP members. The general CCP members shall be directly responsible against Takas Istanbul for the transactions of the trading institutions.

The principles for making use of the CCP services by the trading institutions are exclusively stipulated in Article 16 of the CCP Regulation. Accordingly;

(1) Trading institutions are in charge of providing the following issues:

- a) Monitoring the customer positions and collateral both at itself and at the CCP member, and complying with the arrangements in the CCP Regulation and relevant market directives in relation to margining methods,
- b) Acting in accordance with all rules and principles in the Law and other relevant arrangements related to the monitoring and safe-keeping of customer assets and collateral,
- c) Facilitating continuous reconciliation between the accounts of its own clients with the general CCP member to whom it is associated and the records of the customer positions and collateral available at itself,

- d) Ensuring that their clients are completely and accurately informed of the fact that the power of disposition on their own customers' collateral accounts opened at the general CCP member belongs to the relevant general CCP member and that this power is restricted by Takas Istanbul only with limitation to the collateral amount required to be held,
- e) Furnishing all types of information and documents which may be requested by the relevant general CCP member, Takas Istanbul and the Capital Markets Board on issues deemed necessary in relation to their business and transactions within the scope of the CCP Regulation, and providing all types of support in the reviews to be conducted by those commissioned by Takas Istanbul and the Board.

(2) If it is determined by the relevant general CCP member that any trading institution has failed to partially or wholly fulfill its above-mentioned obligations, this situation shall immediately be notified to Takas Istanbul together with all information and documents substantiating the non-fulfillment of the obligations, and all necessary measures shall be taken to facilitate removal of the relevant discrepancies.

(3) In cases when the relevant trading institution fails to completely fulfill its obligations despite all measures taken by the general CCP member, the positions and collateral of the trading institution's customers shall be transferred to the relevant general CCP member in accordance with the agreement between them upon the request sent by the relevant CCP member to Takas Istanbul. The trading institution advises the transferee member of the ownership information related to the transferred customer positions and collateral. Takas Istanbul gives information to the Board and the relevant public authority within 1 business day about the transfer operation together with the justifications of the transfer taken over from the relevant CCP member.

As can be seen, article 16 of the CCP Regulation covers all issues underlined by CPMI-IOSCO Principle 19.

19.2. An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.

In the markets to which CCP service is provided, there exists no trading institution which presently trades indirectly, but if exists, Takas Istanbul has the ability to detect dependencies that might affect it pursuant to Article 16 of the CCP Regulation.

19.3. 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.

In the markets to which CCP service is provided, there exists no trading institution which presently trades indirectly, but if exists, Takas Istanbul has the ability to monitor the general CCP members' transaction volumes resulting from trading institutions as well as the risk arising out of these transactions.

19.4. An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.

Takas Istanbul does not directly assume the risks of indirect CCP participants (trading institutions), and the general CCP members directly undertake the transactions of the trading institutions towards Takas Istanbul. Although in the markets to which CCP service is provided, there exists no trading institution which presently trades indirectly; Takas Istanbul has all types of means to monitor the general CCP members' risks arising from the trading institutions.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 19:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul has all types of means to manage the risks that might arise from the tiered participation arrangements.

Principle 20: FMI links

An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.

Key considerations

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.*
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.*
3. *(N/A)*
4. *(N/A)*
5. *(N/A)*
6. *(N/A)*
7. *Before entering into a link with another CCP, a CCP should identify and manage the potential spill-over effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.*
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.*
9. *(N/A)*

Key considerations

20.1. 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.

Takas Istanbul performs the clearing and settlement operations of the transactions conducted in the Turkish capital markets by means of the links it has established with Borsa Istanbul which is the exchange operator of the Turkish capital markets, with the Central Registry Agency (CRA) which is the central securities depository and conducts accordingly the custody, registration, right exercising and securities transfer transactions, and with the Central Bank of the Republic of Turkey (CBRT) which operates the national payment system, provides safe-keeping services for the government domestic debt instruments and executes both money and securities transfer transactions.

CBRT conducts an Emergency Test two times a year by the participation of all financial market infrastructures to which it offers service and with which it has link arrangements (including Takas Istanbul and the CRA) and by this way, it has also the ability to measure, monitor, identify and manage the potential risks that might arise from the links it has established with the financial market infrastructures. In addition, when the financial market infrastructures which are the participants of the payment system it manages make revisions in their own systems that might have a potential to

affect the payment systems, the CBRT does not accept implementation of such revisions without their tests are completed by the relevant financial market infrastructure.

Borsa Istanbul, CRA and Takas Istanbul conduct an Emergency Test at least once a year by the participation of other market participants which are also their members and find the opportunity to measure the link-related risks.

Furthermore, those to be performed within the scope of the continuity of clearing and settlement, debt closing, distribution of receivables, conditional virement and free virement transactions being conducted by Takas Istanbul in connection with the CRA are specified in the joint business continuity document signed between Takas Istanbul and the CRA and updated at certain time periods.

In Turkey, Takas Istanbul and the CRA are the sole financial market infrastructures that can be used in the clearing and settlement and safe-keeping of the Turkish capital market instruments and they must operate in a linked manner. Both Takas Istanbul and the CRA observe CPMI-IOSCO principles in their operating principles.

Takas Istanbul has also established a link with two depository institutions domiciled abroad. By taking the international credit rating as the basis, Takas Istanbul Board of Directors allocates custody limits to these institutions where the foreign currency denominated securities eligible as collateral in the markets to which CCP service is provided are to be safekept. In order for the non-cash collateral and guarantee fund contribution amounts of the CCP markets to be safe-kept in the depository institutions domiciled abroad, it must be verified that the non-cash assets are being protected from the bankruptcy or liquidation of the depository institution as well as the proceedings of the creditors of that depository institution. In the present situation, Takas Istanbul's major global depository correspondents are Euroclear Bank S.A. /N.V. located at Brussels, Belgium and Citibank N.A. located at London, United Kingdom, which operate at the international norms. The assessment of their observance of CPMI-IOSCO principles, safekeeping procedures of these entities and their business continuity policies are monitored in a periodic manner and Takas Istanbul's global custody risk is reviewed.

20.2. 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.

Except for Euroclear Bank S.A. /N.V. located at Brussels, Belgium and Citibank N.A. located at London, United Kingdom from which it receives global custody service, Takas Istanbul has no link with any other financial market infrastructure located abroad. Actually, there is not yet any collateral of the CCP market being safe-kept at these institutions. The legal basis of the agreements signed with the said institutions and of the countries governing these agreements is considered adequately strong.

20.3. N/A for CCP activity.

20.4. N/A for CCP activity.

20.5. N/A for CCP activity.

20.6. N/A for CCP activity.

20.7. Before entering into a link with another CCP, a CCP should identify and manage the potential spill-over effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.

Takas Istanbul does not have any link arrangement with any central counterparty institution.

20.8. 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.

Takas Istanbul does not have any link arrangement with any central counterparty institution.

20.9. N/A for CCP activity.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 20:

Observed	Broadly Observed	Partly Observed	Not Observed	Not Applicable
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Takas Istanbul has the capacity to manage the risks associated with the financial market infrastructures which whom it has a linked arrangement.

Principle 21: Efficiency and effectiveness

An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

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.*

Key considerations

21.1. 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.

Takas Istanbul closely monitors the markets it serves and makes regular analyses about the financial markets and the sectors to which it provides service. To ensure operability of its business rules, it works in close contact with the regulatory authorities (CMB, CBRT, and BRSA). In the same vein, it organizes regular and project-based meetings held with the customers as well as member trainings to enable these rules to meet the needs of the customers in an effective manner. Besides these, the annually conducted customer satisfaction surveys also measure the impact that the provided service creates on the counterparty and strengthens the continuous improvement oriented service approach by ensuring the necessary enhancements to be made.

In addition, Takas Istanbul's business continuity vision aims to ensure continuity of the activities without being affected or with minimum effect in the events that might occur outside of its control. The Business Continuity Management System (BCMS) created accordingly is used in an effective manner, and through the "Related Party Analysis" which includes all parties of the provided service, the cooperation and communication development studies are carried out with the relevant external stakeholders. The impacts of the measures taken and improvements made based on the measurements relating to the performance indicators are monitored via the tests conducted at least annually and their results are used as continuous improvement data.

We believe that the Risk Advisory Committee to be established for the markets to which CCP service is provided will enable the CCP members to contribute more to the system design.

21.2. 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.

Basically, Takas Istanbul has the vision of “to be a trustworthy, effective and innovative institution which provides clearing & settlement, banking and central risk management services at global quality standards, as the institution of choice in international markets”. It structures its objectives, strategies and technological infrastructure around this vision and reinforces them with an administrative system.

In this context; pursuant to the “Regulation on Corporate Governance Principles for Banks” published by the Banking Regulation and Supervision Agency (BRSA) and the “Communique on Corporate Governance” published by the Capital Markets Board (CMB), Takas Istanbul prepares 3 year strategic plans to determine its strategies that will guide its activities as a going concern. These objectives are set in accordance with the financial targets aiming to increase the strength and financial value of the bank, the customer targets aiming efficient growth on the customers, the process targets intending to enhance technological infrastructure and provide effective and reliable service at a global level and the organization/HR targets aiming to maximize the competency and performance of human resources. The realizations thereof are monitored in a regular manner to ensure continuous and effective management of the level and performance of achieving these objectives.

By using the legal basis provided by the new Capital Markets Law No. 6362 that has entered into force on 30.12.2012, Takas Istanbul first began to offer the Central Counterparty Services (CCP) as of September 2, 2013 in the Securities Lending Market (SLM) operated under its roof, and as of March 3, 2014, in the Futures and Options Market (VIOP) at BİAŞ. The CCP service is also planned to be provided in the spot “stocks market” and the “debt instruments market” at BİAŞ after the completion of the technological infrastructure transformation carried out in accordance with the strategic partnership between BİAŞ and NASDAQ. Takas Istanbul’s Central Counterparty legislation and business model has been established by observing the CPMI-IOSCO’s core principles and the EMIR (EU) No 648/2012 of the European Union and the technical standards (EU) No 152/2013 and (EU) No 153/2013 with regard to EMIR. When Takas Istanbul’s capital allocated and committed to the CCP markets and the size of guarantee fund in the markets are compared, it can be seen that Takas Istanbul’s level to support the CCP services with its capital is extremely high.

21.3. An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.

Takas Istanbul has governance committees such as Strategic Coordination Committee, Business Continuity Management Committee, Change Advisory Committee, Information Technologies Committee, Information Security Committee and Asset Liability Committee, etc. to effectively identify the targets it has set in accordance with its vision and measure the actualizations thereof. The principles regarding the establishment and operation of these committees are additionally determined, and they convene in regular intervals, the performance shown with respect to the designated objectives are regularly monitored, and supported with new decisions, if necessary.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 21:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul is efficient and effective in meeting the requirements of its participants as well as of the markets in which it operates.

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.

Key consideration

1. An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.

Key considerations

22.1 An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.

The CBRT payment systems (EFT and ESTS) are used for the Turkish Lira payments and local securities transactions. Whereas, for the foreign currency transactions, the correspondent bank accounts are used. For FX and cross-border securities settlement transactions, SWIFT ISO 15022 messages are used. Takas Istanbul’s own systems transform the customer orders to SWIFT messages at ISO 15022 standard and these SWIFT MT messages are sent to the relevant international institutions to finalize the settlement and custody transactions. Likewise, the SWIFT messages incoming from the international institutios are routed to Takas Istanbul systems through exact opposite transactions.

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 22:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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In the payment, clearing and settlement transactions, Takas Istanbul uses internationally accepted communication standards.

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.

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 CPMI (CPSS)-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.*

Key considerations

23.1. 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.

The General Regulation on the Establishment and Operating Principles of Central Clearing and Settlement Institutions, the Central Clearing and Settlement Regulation and the Central Counterparty Regulation which include the skeleton rules applicable for Borsa Istanbul Futures and Options Market and Securities Lending Market to which Takas Istanbul serves as central counterparty and the Market Directives and Procedures which provide detailed explanations about the processes and methods are publicly available on Takas Istanbul's website.

In addition, the user manuals, the amendments and modifications related to the rules and the information forms are announced to the members via General Letters, and these documents are also available on Takas Istanbul's website.

The said skeleton regulations and market directives have been approved by the Capital Markets Board. The market procedures are prepared in a clear and comprehensive manner with the contributions of the relevant business units and the legal consultancy department, by taking account of the provisions of the regulations and directives.

In addition to outlining the routine functioning in the markets to which central counterparty service is provided, the CCP Regulation also includes the arrangements regarding the measures to be taken

in case of emergencies. Article 48 of the CCP Regulation stipulates the measures that can be taken in emergency situations.

The regulations and the market directives cannot be amended without having the approval of the Capital Markets Board; and the justifications for the amendments must be explained to the Capital Markets Board.

23.2. 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.

The reciprocal obligations of Takas Istanbul and the members against the clearing and settlement system have been stipulated in Article 16 of the Central Clearing and Settlement Regulation approved by the CMB. Takas Istanbul undertakes to build the necessary systems according to the market characteristics and establish an efficient and reliable technical infrastructure to ensure complete execution of the clearing and settlement transactions. The members, on the other hand, are obliged to adopt to the system revisions to be made by Takas Istanbul to facilitate continuity in the uninterrupted and secure operation of the system and to participate in the tests they are invited.

The institutions wishing to become a CCP member are further required to examine the form of the "Declaration required to be made by the Board of Directors on Information System, Risk Management, Internal Control and Internal Audit Systems" which is published with the membership agreement templates on Takas Istanbul's website and incorporates the details about the systems they have established at their structures, and to make a written acceptance for their compliance with the specified conditions. The general principles for the CCP membership types and the Internal Credit Rating and Assessment System used in determining the risk limits to be allocated to those accepted to the membership are disclosed to public on the website.

In addition, the membership agreements required to be signed to be able to conduct transactions in Borsa Istanbul Futures and Options Market and Securities Lending Market in which central counterparty service is provided clearly draw the borders about the principles for the market functioning and the rights and obligations of the parties. Besides this, the pre-agreement information forms applicable for the relevant markets contain a copy of the agreement as well as the issues detailing Takas Istanbul's general transaction conditions of indispensable nature; and the candidate member is obliged to declare before signing of the membership agreement that it has examined these forms in a detailed manner and accepted the conditions.

The disclosure to be made to the members, stakeholders and public are stipulated concretely in Article 40 of Takas Istanbul Central Counterparty Regulation on Risk Management Implementation Principles. Accordingly, the following information is disclosed to the members and the public to ensure transparency in the CCP services provided by Takas Istanbul:

- For the managerial arrangements;
 - ✓ Issues relating to the organization and corporate management,
 - ✓ Audited financial statements of the last period,
- For the business rules;

- ✓ Regulations, directives and procedures,
- ✓ Information about the central clearing and settlement services of the Bank,
- ✓ Principles regarding the risk management, membership and default management,
- ✓ Assets accepted as eligible collateral and the collateral valuation haircuts,
- ✓ Collateral monitoring and segregation and the characteristics of collateral accounts,
- ✓ margin requirements and guarantee fund parameters,
- ✓ Summary results of the stress tests and the backtesting tests,
- ✓ Current CCP members,
- ✓ Volume of the daily cleared and settled transactions,
- ✓ Requisite average collateral amount in the market,
- ✓ Clearing and settlement commissions and fees,
- ✓ Technical requirements about system communication protocols.

For the data to be publicly disclosed, the protection of commercial privacy is observed. The member names are not included when disclosing the stress test results.

23.3. 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.

Along with the membership agreements and pre-membership agreement information forms referred (to in 23.2) above; the regulations containing the rules applicable in the markets to which central counterparty service is provided and the market procedures and directives detailing the operating principles also give detailed information about the powers and responsibilities of the members, and these documents are available on Takas Istanbul's website. In addition, the revisions to be applicable for the market rules or functioning as well as the user manuals are announced to the members via General Letters; and member trainings are organized when deemed necessary or upon receipt of requests from the members thereof.

For its members about whom Takas Istanbul reaches the conclusion that they have not completely understood the CCP membership conditions or have misinterpreted the membership conditions, Takas Istanbul has the ability to review the situation and warn the members where necessary before resorting to a heavy disciplinary penalty like suspension of membership or termination of membership. The disciplinary provisions are given in Section Seven of Takas Istanbul Central Clearing and Settlement Regulation.

23.4. 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.

The fees and commissions applicable for the services provided by Takas Istanbul are available on its website. In addition, in cases when this information is updated, the members are informed through a General Letter of the date in which the new tariff will be valid. In determining these tariffs, the necessary comparisons are made with the financial market infrastructures of similar nature, and they enter into force upon the approval of the Capital Markets Board. Hence, for what reason the fee and commission changes were made must be explained to the Capital Markets Board.

23.5. An FMI should complete regularly and disclose publicly responses to the CPMI (CPSS)-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.

Takas Istanbul will announce this report both in Turkish and English languages over its website, of which it has issued by taking account of “CPMI-IOSCO, Disclosure Framework for Financial Market Infrastructures” to assess observance of the central counterparty services it offers of CPMI-IOSCO principles. The framework shall be normally updated once every two year and in case of material changes, it shall be updated without waiting for the two years’ time period.

All information relating to Takas Istanbul’s central counterparty service is available on its corporate website, over the following links.

- Turkish (<http://www.Takas Istanbul.com.tr/tr/Sayfalar/MKT.aspx>)
- English (<http://www.Takas Istanbul.com.tr/en/Pages/MKT.aspx>)

Takas Istanbul Assessment Result for CPMI-IOSCO Principle 23:

Observed <input checked="" type="checkbox"/>	Broadly Observed <input type="checkbox"/>	Partly Observed <input type="checkbox"/>	Not Observed <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
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Takas Istanbul provides sufficient information to enable its participants to have an accurate understanding of the risks, fees, and other material costs they incur, and all relevant rules and procedures regarding the members and markets have been publicly disclosed.

III. APPENDICES

A. Summary Table for Takas Istanbul Assessment against the CPMI-IOSCO Principles

In the assessment we made as Takas Istanbul to determine our CCP activities' level of observance of the core principles published by CPMI-IOSCO on April 2012, we reached the conclusion that we "broadly observe" the core principles no. 2 and no. 13 and "observe" other principles. Because principle 11 relating to the Central Securities Depositories (CSD) and principle 24 relating only to the Trade Repositories (TR) are not applicable, they are left out of assessment. The summary assessment table on the basis of principles is given in Table 3.

Assessment Categories	Principle
Observed	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18,19,20,21,22,23
Broadly Observed	-
Partly Observed	-
Not Observed	-
Not Applicable	11, 24

Table 3- Summary Table for Takas Istanbul Assessment against the CPMI-IOSCO Principles

B. Question sets recommended for use in assessing each key consideration

Principle 1: Legal Basis

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.

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

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

Q.1.1.3: How does the FMI ensure that its legal basis (that is, 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: An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.

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 (for example, 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: 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.

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: 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.

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 (for example, through legal opinions and analyses)?

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: An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.

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? When uncertainty exists regarding the enforceability of an FMI's choice of law 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?

Principle 2: Governance

Key Consideration 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.

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: 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.

Q.2.2.1: What are the governance arrangements under which the FMI's board of directors (or equivalent) 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?

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

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 these procedures are 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?

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: 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).

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: 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.

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: 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.

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: 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.

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 conflicts of interest between stakeholders and the FMI are identified, and how are they addressed?

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?

Principle 3: Framework for the comprehensive management of risks

Key Consideration 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.

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

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?

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

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: 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.

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?

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: 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.

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?

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?

Principle 4: Credit Risk

Key Consideration 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.

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

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 (for example, 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: 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 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 resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.

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: A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). 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 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.

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?

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?

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?

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?

Key Consideration 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 OOP'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 OOP's participants increases significantly. A full validation of a OOP's risk-management model should be performed at least annually.

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?

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: 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.

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: 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.

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 borrow from liquidity providers?

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?

Principle 5: Collateral:

Key Consideration 1: An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.

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

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?

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: 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.

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: 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.

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 (for example, 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: 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.

Q.5.5.1: What are the legal, operational, market 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: An FMI should use a collateral management system that is well-designed operationally flexible.

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 reuse of collateral and its rights to the collateral provided?

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?

Principle 6: Margin

Key Consideration 1: A CCP should have a margin system that establishes margin levels commensurate with the risks and articular attributes of each product, portfolio, and market it serves.

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

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

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 margin requirements commensurate with the risks and particular attributes of each product, portfolio and market it serves?

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

Q.6.1.7: How does the CCP enforce timelines for margin 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: A CCP should have a reliable source of timely price data for its margin system. A CCP should also have procedures and sound valuation models for addressing circumstances in which pricing data are not readily available or reliable.

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

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

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

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

Key Consideration 3: A CCP should adopt initial margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default. Initial margin 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 margin at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a CCP that calculates margin 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.

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

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

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

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 (for example, 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 margin model? What factors are considered (for example, 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?

Q.6.3.7: How does the CCP address procyclicality in the margin methodology? In particular, does the CCP adopt margin 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: A CCP should mark participant positions to market and collect variation margin at least daily to limit the build-up of current exposures. A CCP should have the authority and operational capacity to make intraday margin calls and payments, both scheduled and unscheduled, to participants.

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

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

Key Consideration 5: In calculating margin requirements, a CCP may allow offsets or reductions in required margin 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-margining, they must have appropriate safeguards and harmonized overall risk management systems.

Q.6.5.1: Does the CCP allow offsets or reductions in required margin 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 margin?

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 margining methodology account for offsets or reductions in required margin across products that it clears?

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

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

Key Consideration 6: A CCP should analyse and monitor its model performance and overall margin 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 margin 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.

Q.6.6.1: Describe in detail the backtesting methodologies and model performance, including both target confidence level and the result of overall margin coverage. How does such testing address portfolio effects within and across asset classes within the CCP and cross-margining 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 margin 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?

Q.6.6.3: What are the identified potential shortcomings of the margin 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: A CCP should regularly review and validate its margin system.

Q.6.7.1: How does the CCP regularly review and validate its margin 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 margin 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?

Principle 7: Liquidity Risk

Key Consideration 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.

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: 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.

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: 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.

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: A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin 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.

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 margin 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: 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.

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?

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: 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.

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: 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.

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: An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.

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: 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.7.8.3: 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.7.8.4: 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: 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.

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?

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 (for example, 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 multiples roles with respect to the FMI?

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: 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.

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?

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?

Principle 8: Settlement Finality

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

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 (for example, by obtaining a well-reasoned legal opinion)?

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: 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.

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?

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

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 (for example, 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?

Principle 9: Money Settlements

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

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

Key Consideration 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.

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: 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.

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

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: 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.

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?

Principle 10: Physical Deliveries

Key Consideration 1: An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.

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: An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.

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?

Principle 11: Central securities depositories

Key Consideration 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 unauthorized creation or deletion of securities, and conduct periodic and at least daily reconciliation of securities issues it maintains.

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 official registrar?

Key Consideration 2: A CSD should prohibit overdrafts and debit balances in securities accounts.

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

Key Consideration 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.

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?

Q.11.3.3: What incentives, if any, does the CSD provide to immobilise or dematerialise securities?

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

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 recordkeeping 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 (for example, insurance or other compensation schemes)?

Key Consideration 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.

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: 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.

Q.11.6.1: Does the CSD provide services other than central safekeeping and administration of securities and settlement? If so, what services?

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?

Principle 12: Exchange-of-value settlement systems

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.

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?

Principle 13: Participant-default rules and procedures

Key Consideration 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.

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?*

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

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

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: 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.

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?

Principle 14: Segregation and portability

Key Consideration 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.

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?

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?

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: 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.

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: If the CCP (or its custodians) holds collateral supporting customers' positions, what does this collateral cover (for example, initial margin or variation margin requirements)?

Q.14.2.3: 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 margin 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: 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.

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: 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.

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?

Principle 15: General business risk

Key Consideration 1: An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.

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: 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.

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: 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.

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 (for example, 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: 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.

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: 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.

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?

Principle 16: Custody and investment risks

Key Consideration 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.

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: An FMI should have prompt access to its assets and the assets provided by participants, when required.

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: An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.

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: An FMI's investment strategy should be consistent with 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.

Q.16.4.1: How does the FMI ensure that its investment strategy is consistent with its overall risk management strategy? How and to whom does the FMI disclose its investment strategy?

Q.16.4.2: How does the FMI ensure on an ongoing basis that its investments are secured by, or are claims on, high-quality obligors?

Q.16.4.3: 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.16.4.4: Does the FMI invest participant assets in the participants' own securities or those of its affiliates?

Q.16.4.5: How does the FMI ensure that its investments allow for quick liquidation with little, if any, adverse price effect?

Principle 17: Operational risk

Key Consideration 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.

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 (for example, 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?

Q.17.1.3: How does the FMI monitor and manage the identified operational risks? Where are these systems, policies, procedures and controls documented?

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: 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.

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: An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.

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: An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.

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: An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.

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?

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: 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.

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?

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 (for example, 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?

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?

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: 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.

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?

Principle 18: Access and participation requirements

Key Consideration 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.

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?

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: 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.

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 (for example, 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)?

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?

Q.18.2.5: How are participation criteria, including restrictions in participation, publicly disclosed?

Key Consideration 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.

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?

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?

Principle 19: Tiered participation arrangements

Key Consideration 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.

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?

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: An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.

Q.19.2.1: How does the FMI identify material dependencies between direct and indirect participants that might affect the FMI?

Key Consideration 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.

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: An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.

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?

Principle 20: FMI links

Key Consideration 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.

Q.20.1.1: What process is used to identify potential sources of risk (such as, legal, credit, liquidity, custody 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: 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.

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: 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.

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: 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.

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: 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.

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: 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.

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: Before entering into a link with another CCP, a CCP should identify and manage the potential spill-over effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.

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: 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.

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?

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 margin 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?

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: A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.

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?

Principle 21: Efficiency and effectiveness

Key Consideration 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.

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: 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 (for example, through the use of feedback mechanisms)?

Key Consideration 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.

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: An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.

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?

Principle 22: Communication procedures and standards

Key Consideration 1: An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.

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?

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?

Principle 23: Disclosure of rules, key procedures, and market data

Key Consideration 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.

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: 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.

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: 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.

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: 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.

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: An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.

Q.23.5.1: When did the FMI last complete the CPSS-IOSCO Disclosure framework for 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?

Principle 24. Disclosure of market data by trade repositories

Key Consideration 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.

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: 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.

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: 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.

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?