

Responding Institution:

OTC Clearing Hong Kong Limited

Jurisdiction(s) in which the FMI Operates:

Hong Kong Special Administrative Region

Authority Regulating, Supervising or Overseeing the FMI:

Securities and Futures Commission of Hong Kong

The date of this disclosure is June 2017. This disclosure can be found at <http://www.hkex.com.hk/eng/prod/clr/otclrsett/PFMI.htm>. For further information, please email OTC_Clear@hkex.com.hk.

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I. Executive Summary

1. OTC Clearing Hong Kong Limited (**OTC Clear**) is a Hong Kong-incorporated subsidiary of Hong Kong Exchanges and Clearing Limited (**HKEX**) and commenced operations in November 2013. HKEX holds 75% of the issued share capital of OTC Clear and has 100% of the voting rights. 12 other financial institutions (the **Non-Voting Ordinary Shareholders**) own, in aggregate, the remaining 25% issued share capital and they are or intend to be OTC Clear Clearing Members.
2. OTC Clear was established for the purpose of providing clearing services for over-the-counter (**OTC**) derivatives as a central counterparty (**CCP**). OTC Clear is recognised by the Securities and Futures Commission (the **SFC**), Hong Kong's statutory regulator for the securities and futures markets, under Section 37(1) of the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong) (**SFO**) as a recognised clearing house (**RCH**), and designated as a CCP for the purposes of Part IIA of the SFO in respect of certain OTC derivative products. In addition, OTC Clear is a designated CCP for the purposes of mandatory clearing of certain classes of OTC derivative products under Part IIIA of the SFO.
3. OTC Clear is recognised as a third country central counterparty (**TCCCP**), by the European Securities and Markets Authority, which allows clearing houses located outside the European Union to offer clearing services to certain European financial institutions. In addition, OTC Clear also obtains order of exemption from registration as a Derivatives Clearing Organization (Exempted DCO status) from the US Commodity Futures Trading Commission that allows it to provide clearing for proprietary positions for US persons. OTC Clear is also recognised as a prescribed facility under the regime for mandatory central clearing of OTC derivatives in Australia.
4. Currently, OTC Clear provides inter-dealer clearing services and Client Clearing Services for interest rate swaps¹ and non-deliverable currency forwards. It accepts Clearing Members who are either banking institutions (**Authorised Institutions**) licensed by the Hong Kong Monetary Authority (**HKMA**) – Hong Kong's banking regulator, or corporations licensed by the SFC (**Licensed Corporations**).
5. As an RCH, OTC Clear is required at all times to comply with its statutory duties under the SFO. In August 2013, the SFC published guidelines requiring RCHs to observe on an ongoing basis the Principles for Financial Market Infrastructures (the **PFMI**) published by the Committee on Payments and Market Infrastructure (**CPMI**) and the International Organization of Securities Commissions (**IOSCO**) in April 2012, to the extent that these

¹ Including single currency interest rate swaps, single currency basis swaps, non-deliverable interest rate swaps, cross-currency interest rate swaps and cross-currency basis swaps.

apply to CCPs. The SFC's recognition of OTC Clear as an RCH was on the basis of its assessment of OTC Clear's compliance with the PFMI.

6. OTC Clear has implemented a comprehensive risk management framework which is designed to ensure the financial performance of all cleared Contracts by adequately controlling credit, market and liquidity risks. OTC Clear has appropriate policies, procedures and controls in place to manage the additional risks that its clearing services are exposed to including operational risk, legal risk, custody and investment risk, general business risk and settlement risk.
7. OTC Clear's approaches to observing each applicable principle² in the PFMI are summarised in this disclosure document. This document is written pursuant to and in accordance with the guidelines set forth in the Disclosure framework and Assessment methodology issued by CPMI-IOSCO in December 2012.

² *Three of the 24 PFMI principles are not applicable to OTC Clear as a CCP. They are Principle 10 – Physical Deliveries, Principle 11 – Central Securities Depositories and Principle 24 – Disclosure of Market Data by Trade Repositories.*

II. Summary of Major Changes since the Last Update of the Disclosure

8. This version was published on June 2017 in adherence with the CPMI-IOSCO's recommendations for FMIs to update their public disclosure documents at least every two years or following materials changes to their system or environment. This version has incorporated the changes made by OTC Clear for the introduction of Client Clearing Services, acceptance of Non-cash Collateral and clearing services for HKD single currency basis swaps and non-deliverable interest rate swaps which are denominated in other Asian currencies.

III. General Background on OTC Clear

General Description of OTC Clear and the Markets It Serves

9. OTC Clear was established in response to the G20 leaders' commitments of September 2009, to address structural deficiencies in the OTC derivatives markets and the systemic risks posed to the wider economy. Amongst other things, the G20 leaders committed to reforms that would require the mandatory clearing of standardised OTC derivative transactions through central counterparties.
10. Ahead of a mandatory clearing regulatory regime becoming effective in Hong Kong, OTC Clear took the initiative to accept the voluntary submission of OTC derivatives for central clearing in Hong Kong in November 2013. OTC Clear's clearing services complement the trade repository of the HKMA, which was established to enable the reporting of OTC derivatives in Hong Kong and to provide greater transparency to the market. Currently, OTC Clear is offering inter-dealer clearing services and Client Clearing Services for interest rate swaps and non-deliverable currency forwards conducted by Authorised Institutions or Licensed Corporations in Hong Kong. As an RCH operating within the statutory framework under Division 3 of Part III of the SFO, OTC Clear acts in the interest of the public in discharging its statutory duties, as described in further detail below. It aims to maintain financial stability and promote transparency of the OTC derivatives market in Hong Kong by offering expeditious clearing and robust risk management services to market participants.

Organisational Structure of OTC Clear

11. HKEX holds 75% of the issued share capital and 100% of the voting rights of OTC Clear. As mentioned, 12 Non-Voting Ordinary Shareholders who are or intend to be Clearing Members own, in aggregate, the remaining 25% of OTC Clear's issued share capital. HKEX is a recognised exchange controller under the SFO with its own statutory duties, including the duty to ensure that any RCH controlled by it performs its duties properly. HKEX is thus legally obliged to take on an active role in overseeing and ensuring the proper functioning of OTC Clear.
12. HKEX is a listed company on the Main Board of the Stock Exchange of Hong Kong Limited (SEHK). It is the holding company of the following three exchanges and five clearing houses in Hong Kong and the United Kingdom (UK):
 - (a) The SEHK;
 - (b) Hong Kong Futures Exchange Limited (**HKFE**);

- (c) The London Metal Exchange (**LME**);
- (d) Hong Kong Securities Clearing Company Limited (**HKSCC**);
- (e) The SEHK Options Clearing House Limited (**SEOCH**);
- (f) HKFE Clearing Corporation Limited (**HKCC**);
- (g) OTC Clear; and
- (h) LME Clear Limited (**LME Clear**).

Governance Structure of OTC Clear

13. OTC Clear's governance structure comprises the OTC Clear Board and five committees and groups that have been established to assist the Board with the management and operation of the clearing services. In addition, OTC Clear leverages the HKEX Board and its various committees, including the statutory HKEX Risk Management Committee which is responsible for the control and risk management matters of the HKEX Group and provides an added layer of oversight and supervision over the safety and soundness of OTC Clear's own risk management safeguards, and the HKEX Audit, Nomination, Remuneration and Investment Advisory Committees, to carry out the important functions of independent financial and operational audit, the nomination of directors, oversight in the determination of directors and staff remuneration and advising on investment policies.
14. The OTC Clear Board consists of ten members, comprising four independent non-executive directors (**INEDs**), two HKEX executives, one representative of a Client of a Clearing Member of OTC Clear or a clearing member of any other OTC CCP and three Non-Voting Ordinary Shareholder representatives. It oversees OTC Clear's activities and the execution of its business strategies.
15. The Risk Management Committee consists of three INEDs of OTC Clear, one Clearing Member representative and one representative of a Client of a Clearing Member of OTC Clear or a clearing member of any other OTC CCP, and is responsible for advising OTC Clear on its risk profile, tolerance, strategy and risk management policies.
16. The Default Management Group consists of the Head of FIC & OTC Clearing Risk Management Department and four representatives and one back-up representative from Clearing Member firms. It is responsible for assisting OTC Clear with the Default Management Process following a default of a Clearing Member.
17. The User Committee consists of one HKEX executive, 12 representatives from Non-Voting Ordinary Shareholders and one industry representative nominated by HKEX.

It is responsible for advising OTC Clear on product and market development and strategic issues.

18. The Disciplinary Committee and Disciplinary Appeals Committee are ad hoc committees which will be formed following the commencement of a disciplinary proceeding against a Clearing Member or the lodgement of an appeal against a first instance decision.
19. OTC Clear's day-to-day business is managed by two dedicated departments: the Operations and Clearing Risk Management Departments. The Head of Clearing of the HKEX Group is the Chief Executive of OTC Clear. The senior management of OTC Clear is responsible to and take their directions from the OTC Clear Board.

Product Coverage and Clearing Members

20. OTC Clear currently accepts the following products for clearing:

Products	Currencies	Maximum Residual Term
Single currency interest rate swaps	Offshore Renminbi (CNY (offshore)) United States Dollar (USD) Euro (EUR) Hong Kong Dollar (HKD)	10 years
Single currency basis swaps	USD, EUR, HKD	10 years
Non-deliverable interest rate swaps	USD / CNY	5 years
	USD / Indian Rupee (INR)	10 years
	USD / Korean Won (KRW)	
	USD / Malaysian Ringgit (MYR)	
	USD / Thai Baht (THB)	
USD / Taiwanese Dollar (TWD)		
Cross-currency interest rate swaps	CNY(offshore) / USD	10 years
Cross-currency basis swaps	CNY(offshore) / USD	10 years

Non-deliverable currency forwards	USD / CNY USD / INR USD / KRW USD / TWD	2 years
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21. OTC Clear accepts Clearing Members who are either Authorised Institutions or Licensed Corporations in Hong Kong.

Risk Management Framework

22. OTC Clear has established a comprehensive risk management framework to monitor and manage various types of risks that arise in or are borne by OTC Clear:
- (a) **Legal risk** – OTC Clear has obtained a Hong Kong law opinion from an independent law firm to confirm that each of the material aspects of its activities and its Clearing Documentation are enforceable under Hong Kong law;
 - (b) **Liquidity risk** – OTC Clear assesses its liquidity needs daily and maintains its minimum liquid resources in same day funds to ensure that it is able to meet its payment and delivery obligations in a timely manner;
 - (c) **Credit risk** – OTC Clear adopts risk-related Membership requirements, conducts daily credit risk monitoring of and imposes Margin and Rates and FX Guarantee Fund contribution requirements on its Clearing Members;
 - (d) **Market risk** – OTC Clear requires each of its Clearing Members to post Initial Margin with at least a 99% single-tailed confidence level over a five-day holding period to cover potential future exposures arising in a Clearing Member's House Position Account and where relevant, Client Account over a seven-day holding period. Variation Margin is imposed to cover market fluctuations. The Contracts are marked to market every 30 minutes during each clearing day. Each Clearing Member is required to make contributions to the Rates and FX Guarantee Fund to cover the remaining tail risk (beyond the Initial Margin coverage);
 - (e) **Settlement risk** – OTC Clear minimises settlement bank risk by imposing stringent appointment criteria and concentration limits on exposures to settlement banks. OTC Clear also conducts on-going monitoring of settlement banks' performance. For risk arising out of notional exchange settlements, OTC Clear adopts different mitigating measures including the use of the payment-versus-payment mechanism, and imposition of the Notional Exchange Risk Limits on an individual Clearing Member basis.
 - (f) **General business risk** – OTC Clear monitors scenarios that may affect its financial position and maintains regulatory capital which is sufficient to cover its projected total operating expenditure for at least the following 12 months;
 - (g) **Custody and investment risk** – OTC Clear adopts stringent selection criteria to appoint settlement and custodian banks for the custody of its own investment assets and Clearing Members' Collateral. The primary principles of OTC Clear's investment policy are to ensure the preservation of capital, to remain sufficiently liquid and minimize risk while optimizing return on investments;

- (h) **Operational risk** – OTC Clear follows HKEX Group’s Enterprise Risk Management Framework to manage operational risk and has established a Market Contingency Plan (**MCP**) setting out the contingency and recovery procedures to address operational risks that may affect its critical operations and services. The primary resilience objective is to ensure that system recovery can be achieved within two hours. In addition, OTC Clear follows HKEX Group’s physical and information security policies to manage potential physical threats and systems’ vulnerabilities; and
- (i) **Concentration risk** – OTC Clear monitors and manages concentration risk in respect of money settlement concentration among the settlement banks, investment counterparty concentration and Clearing Members’ position concentration.
23. The risk management policies of OTC Clear are reviewed by an independent consultant annually (where appropriate) and the Head of FIC & OTC Clearing Risk Management Department meets quarterly with the Risk Management Committee to review the effectiveness of its risk management framework.

Clearing Statistics of OTC Clear

24. As of end-April 2017 the cumulative notional amounts of outstanding contracts cleared by OTC Clear are:

Product	Cumulative notional amount outstanding (HKD equivalent)
Rates Derivatives	74,829,544,733
FX Derivatives	–

Operational Reliability

25. OTC Clear’s primary operational objectives are to ensure that the OTC Clearing and Settlement System (**OCASS**) is available for the provision of clearing services from 08:30 am to 07:00 pm on each clearing day (OTC Clear is in operation every weekday in a calendar year other than 1 January) and that system recovery can be achieved within two hours following a disruption to OTC Clear’s critical functions, in each case under specific contingency scenarios.
26. OCASS has scalability and load balancing features that allow it to support higher volumes by upgrading and expanding hardware without significant architectural changes. The system capacity is scaled based on the projected clearing volumes and a capacity buffer has been put in place to handle potential stress volumes.

Legal and Regulatory Framework

27. Under Section 40 of the SFO, OTC Clear has the power to make rules as are necessary and desirable for the proper regulation and efficient operation of its clearing or settlement facilities, and for the proper regulation of its Clearing Members. However, no rule or amendment of any rule can be made unless the SFC has given its approval in writing under Section 41 of the SFO.
28. Clearing Members are required to comply with the Clearing Rules (OTC Clear Rates and FX Derivatives Clearing Rules), the Clearing Procedures (OTC Clear Clearing Procedures), the Membership Agreement and other notices and procedures (collectively the **Clearing Documentation**) issued from time to time by OTC Clear. The Hong Kong legal framework provides a high degree of legal certainty for each material aspect of OTC Clear's activities. The framework supports and allows OTC Clear to conduct material aspects of its activities as a CCP. These include novation, netting, finality of Contracts and transfer of funds, default procedures, settlement finality, Collateral and Rates and FX Guarantee Fund arrangements, enforceability of the Clearing Documentation with regard to its Clearing Members, and conflict of laws determinations.
29. In addition to the rules and contractual arrangements, the legal basis/framework supporting the material aspects of OTC Clear's activities includes the following:
- (a) the Bankruptcy Ordinance (Cap. 155 of the Laws of Hong Kong);
 - (b) the Companies Ordinance (Cap. 622 of the Laws of Hong Kong);
 - (c) the SFO;
 - (d) the Clearing and Settlement Systems Ordinance (**CSSO**) (Cap. 584 of the Laws of Hong Kong) in respect of payment settlement finality; and
 - (e) general Hong Kong common law in relation to contracts, tort and property.
30. OTC Clear conducts all of its business in Hong Kong and the Clearing Documentation is governed by Hong Kong law. OTC Clear engaged an independent law firm to issue a Hong Kong law opinion which covers each of the material aspects of OTC Clear's activities and provides a high level of confidence that the Clearing Documentation is enforceable under Hong Kong law. OTC Clear shares the Hong Kong law opinion with its Clearing Members at their request for information purposes and on a non-reliance basis.
31. OTC Clear is regulated by the SFC under Division 3 of Part III of the SFO. Under Section 38 of the SFO, OTC Clear has the duty to ensure, so far as is reasonably practicable, that there are orderly, fair and expeditious clearing and settlement arrangements for transactions cleared or settled through its facilities and that risks associated with its business and operations are managed prudently. OTC Clear shall operate its facilities in

accordance with the rules approved by the SFC under Section 41 of the SFO as mentioned earlier, and formulate and implement appropriate procedures for ensuring that its Clearing Members comply with the rules. Additionally, OTC Clear shall at all times provide and maintain:

- (a) adequate and properly equipped premises;
- (b) competent personnel; and
- (c) automated systems with adequate capacity, facilities to meet contingencies or emergencies, security arrangements and technical support,

for the conduct of its business.

32. In discharging its statutory duties, OTC Clear is under an obligation to act in the interests of the public, having particular regard to the interests of the investing public. It is required to ensure that the interests of the public prevail where there is a conflict between the public interest and its own interest. The SFC has the power to require OTC Clear to comply with its directions, orders and requirements. In addition to the statutory duties under the SFO, OTC Clear is required by the SFC to comply with the PFMI to the extent that they apply to CCPs.

System Design

33. OTC Clear has developed and implemented its own OTC Clearing and Settlement System – OCASS, to support its clearing services. The major functions of OCASS include:
- (a) **Trade registration** – receiving affirmed trades from Approved Trade Registration Systems (**ATRS**), performing validation checks and trade registration, either real-time or during a trade novation cycle;
 - (b) **Trade lifecycle event management** – management of rate fixings, notional exchanges and coupon payments;
 - (c) **Trade valuation and Margin calculation** – the valuation of trades and Collateral and the calculation of Margin requirements using real-time market data; and
 - (d) **The provision of Clearing Member services via the Web Portal** (known as “OTC Account Services Information System” (**OASIS**)) – this allows for the submission of collateral deposit/porting/withdrawal requests, the retrieval of daily clearing reports and the uploading of trade details for Margin simulation by Clearing Members.

34. OCASS has established interfaces with three ATRS to capture OTC derivatives transactions. Clearing Members can submit trades for their house business and/or for their client business for matching and confirmation through any of the three ATRS. Once matched, trade data is transmitted directly to OCASS for validation checks, namely product eligibility, Margin, credit, position limit and Notional Exchange Risk Limit³ checks.
35. Trades that pass the validation checks are accepted for registration by OTC Clear, such that the original trade between the Clearing Members for their house business and/or client business is substituted by two separate trades, each facing the CCP. Trades that do not satisfy the product eligibility requirements are rejected by OCASS. Trades that do not satisfy the Margin, credit and position limit requirements are put into “pending” status in OCASS and may be accepted for registration at a later portfolio novation cycle when the relevant requirement(s) are fulfilled. An update on the trade status (accept/pending/reject) is communicated to the Clearing Members via the relevant ATRS.

Money and Non-Cash Collateral Settlements

36. OTC Clear conducts money settlement of each Contractual Currency (i.e., USD, HKD, EUR and CNY (offshore)) through the Real Time Gross Settlement (**RTGS**) systems in Hong Kong. The RTGS systems operated by Hong Kong Interbank Clearing Limited (**HKICL**) are recognised under the CSSO, which provides statutory backing to the finality of settlement for transactions made through the RTGS systems.
37. Each Clearing Member either has to be a member of the RTGS systems for each Contractual Currency to effect direct payments with OTC Clear, or maintain account(s) with an HKMA Authorised Institution that is a member of the RTGS systems to handle money settlement on its behalf. As OTC Clear is not a member of the RTGS systems, it has appointed five such Authorised Institutions, which are RTGS systems members as its settlement banks for handling money settlements. Three of the settlement banks are note-issuing banks in Hong Kong. To manage its credit and liquidity risk exposure to cash assets being kept with settlement banks, OTC Clear has adopted stringent selection criteria for settlement banks.
38. In order to accept Non-cash Collateral from Clearing Members, OTC Clear has appointed the Central Moneymarkets Unit of the Hong Kong Monetary Authority (**CMU**) as its Non-cash Collateral custodian. For deposit of Non-cash Collateral to OTC Clear, a Clearing Member can instruct its own custodian to deliver such Non-cash Collateral to OTC Clear’s designated account maintained with CMU. For withdrawal of Non-cash Collateral deposited with OTC Clear, OTC Clear will instruct the CMU to deliver the

³ *Notional Exchange Risk Limit check is applicable to clearing of CCS only.*

relevant Non-cash Collateral to the designated account maintained by such Clearing Member.

Timeline of Clearing Activities

39. The timeline of a typical clearing day's activities is set out below:

Hong Kong Time	Activities			
07:30 am				
08:30 am	Trade novation process	Issue ad hoc intra-day Variation Margin call (if any)	OASIS available for access by Clearing Members	Issue end-of-day Initial Margin call on OASIS
09:30 am				Deadline for fulfilling end-of-day Initial Margin call
11:00 am				Deadline for fulfilling end-of-day settlement components ⁴
11:00 am				Deadline for submitting excess Collateral withdrawal request
12:00 noon				Deadline for fulfilling notional exchange components ⁵
02:00 pm				Settle net cash settlement payable by OTC Clear
02:15 pm				Issue routine intra-day Variation Margin call on OASIS
03:00 pm				
03:15 pm				Deadline for fulfilling routine intra-day Variation Margin call
04:00 pm				Deadline for submitting Collateral deposit request
06:00 pm				
07:00 pm				
11:00 pm				

⁴ Settlement components consist of fees and interest, net cash settlement payable by clearing members to OTC Clear (including coupon payments for interest rate swaps, settlement amounts for non-deliverable currency forwards, end-of-day Variation Margin and Price Alignment Interest etc).

⁵ Clearing members must be operationally ready to settle the notional exchange components of cross currency swaps by providing the relevant instruction to Hong Kong Interbank Clearing Limited and reserving sufficient funding.

IV. Glossary

Capitalised terms defined in the Clearing Rules and the Clearing Procedures of OTC Clear shall have the same meaning when used in this disclosure document. Terms defined in the PFMI have the same meaning when used in this disclosure document.

The terms in the following table, which are not defined in the Clearing Rules, the Clearing Procedures or the PFMI, shall have the meanings given below.

Term	Definition
ATRS	Approved Trade Registration Systems
CCP	Central counterparty
CFTC	The United States Commodity Futures Trading Commission
CMU	Central Moneymarkets Unit of the Hong Kong Monetary Authority
CNY	Renminbi
CNY (offshore) or CNH	Renminbi settled through a Renminbi bank account maintained in an Offshore CNY Centre
CPMI	Committee on Payments and Market Infrastructures (Formally known as Committee on Payment and Settlement Systems)
CSSO	Clearing and Settlement Systems Ordinance (Cap. 584 of the Laws of Hong Kong)
DTC	Deposit-taking Company
EMIR	European Market Infrastructure Regulation
ESMA	European Securities and Markets Authority
EUR	Euro
FMI	Financial Market Infrastructure
HKCC	HKFE Clearing Corporation Limited
HKD	Hong Kong Dollar
HKEX	Hong Kong Exchanges and Clearing Limited
HKFE	Hong Kong Futures Exchange Limited
HKICL	Hong Kong Interbank Clearing Limited
HKMA	Hong Kong Monetary Authority
HKSCC	Hong Kong Securities Clearing Company Limited
INED	Independent non-executive director

Term	Definition
INR	Indian Rupee
IOSCO	International Organization of Securities Commissions
ISDA	International Swaps and Derivatives Association
KRW	Korean Won
LME	The London Metal Exchange
LME Clear	LME Clear Limited
MCP	Market Contingency Plan
MYR	Malaysian Ringgit
OASIS or Web Portal	OTC Account Services Information System
OCASS	OTC Clearing and Settlement System
OTC	Over-the-counter
OTC Clear	OTC Clearing Hong Kong Limited
PFMI	Principles for Financial Market Infrastructures issued by CPMI-IOSCO in April 2012
PVP	A mechanism in a foreign exchange settlement system linked with RTGS system to ensure that a transfer of one currency occurs only if a transfer of the other currency or currencies also takes place
RCH	Recognised Clearing House
RLB	Restricted Licence Bank
RTGS	The Real Time Gross Settlement systems in Hong Kong
SEHK	The Stock Exchange of Hong Kong Limited
SEOCH	The SEHK Options Clearing House Limited
SFC	Securities and Futures Commission of Hong Kong
SFO	Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong)
THB	Thai Baht
TWD	Taiwanese Dollar
USD	United States Dollar

V. Principle-by-principle Summary Disclosure

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.

Material Aspects

- 1.1 The material aspects of OTC Clear's activities that require legal certainty are:
- (a) Clearing Membership;
 - (b) the rights and obligations of OTC Clear and its Clearing Members in respect of clearing services and cleared Contracts;
 - (c) the formation by novation, enforceability of netting arrangements and settlement finality of Contracts;
 - (d) terms of Client Clearing Services;
 - (e) the segregation of positions and Collateral between Clearing Members and their Clients;
 - (f) the rights and interests of OTC Clear and its Clearing Members to financial provisions constituting Margin and the guarantee fund;
 - (g) the finality of funds transfers for payments under cleared Contracts;
 - (h) Clearing Member default procedures;
 - (i) procedures for the recovery and wind-down of OTC Clear; and
 - (j) provisions for the insolvency of Clearing Members or OTC Clear.

Legal Soundness

- 1.2 OTC Clear is an RCH regulated by the SFC, Hong Kong's statutory regulator for the securities and futures markets, under Section 37(1) of the SFO. OTC Clear is governed by Division 3 of Part III of the SFO, by its Clearing Rules, Clearing

Procedures, the Membership Agreement and other notices and procedures (collectively the **Clearing Documentation**) issued from time to time by OTC Clear.

- 1.3 All Clearing Documentation, risk management and business policies of OTC Clear have been reviewed and approved by the SFC. In addition, when drafting its Clearing Documentation, OTC Clear consulted with and incorporated comments on the Clearing Documentation from existing and potential Clearing Members representing a cross section of international, Hong Kong and Mainland-based banks and dealers.
- 1.4 Hong Kong is the relevant jurisdiction of OTC Clear's activities and OTC Clear has obtained a legal opinion in respect of Hong Kong law from an independent law firm which covers the material aspects of OTC Clear's activities. The Hong Kong law opinion provides a high degree of certainty that the Clearing Documentation of OTC Clear is enforceable against OTC Clear and the Clearing Members under Hong Kong law and that there is a sound legal basis upon which OTC Clear operates as a CCP. OTC Clear will review the Hong Kong law opinion from time-to-time to ensure it remains current and relevant,
- 1.5 The Hong Kong legal framework supports and allows OTC Clear to conduct material aspects of its activities as a CCP. The legal basis/framework supporting the material aspects of OTC Clear's activities consists of the Bankruptcy Ordinance, the Companies Ordinance, the SFO, the CSSO in respect of payment settlement finality and general Hong Kong common law in relation to contracts, tort and property.
- 1.6 As of today's date OTC Clear has admitted Clearing Members incorporated not only in Hong Kong but also the United Kingdom, the United States of America, Germany and the People's Republic of China. Accordingly OTC Clear has obtained legal opinions from counsel in those jurisdictions which provide a high degree of certainty that the Clearing Documentation of OTC Clear is enforceable against those Clearing Members in the jurisdictions in which they are incorporated. In addition OTC Clear has obtained legal opinions from counsel in Australia and Singapore in light of onboarding Clearing Members from those jurisdictions. OTC Clear will obtain legal opinions from independent law firms in respect of any other relevant foreign jurisdictions as well as conflict of laws issues arising from the laws of such jurisdictions, if in future, OTC Clear:
 - (a) decides to admit a Clearing Member that is not incorporated in Hong Kong, the United Kingdom, the United States, Germany, the People's Republic of China, Australia or Singapore;
 - (b) conducts a material aspect of its activities as a CCP outside Hong Kong;
 - (c) holds Collateral in another jurisdiction; or

- (d) enters into any agreement relevant to the material aspects of OTC Clear's activities with a governing law other than Hong Kong. The Hong Kong law opinion will be reviewed and, if applicable, updated to cover any additional conflict of laws issues relating to the identified jurisdictions.

Overseas Recognition

- 1.7 On 21 December 2015, OTC Clear obtained exemption from registration as a DCO from the U.S. CFTC, which allows OTC Clear to provide clearing services to Clearing Members that are branches or affiliates of US banks in Hong Kong without being registered as a Derivatives Clearing Organisation.
- 1.8 On 27 April 2015 OTC Clear was recognised as a third country CCP by the EMIR, which allows Clearing Members of OTC Clear to fulfil their EU-mandated clearing obligations through its service.
- 1.9 On 3 September 2015, OTC Clear was recognised as a prescribed facility in Australia under Regulation 7.5A.63 of the Corporations Amendment (Central Clearing and Single-Sided Reporting) Regulation 2015, which allows Clearing Members of OTC Clear to fulfil their Australian mandated clearing obligations through its service.

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.

Regulatory Requirements

- 2.1 OTC Clear is regulated by the SFC under Division 3 of Part III of the SFO as an RCH. It has a statutory duty to ensure, so far as reasonably practicable, that there are orderly, fair and expeditious clearing and settlement arrangements for transactions cleared or settled through its facilities and that risks associated with its business and operations are managed prudently. It must, at all times, provide and maintain adequate and properly equipped premises, competent personnel, and automated systems with adequate capacity to meet contingencies or emergencies, security arrangements and technical support, for the conduct of its business. In discharging its statutory duties, OTC Clear is under an obligation to act in the interests of the public, having particular regard to the interests of the investing public. Where there is a conflict between the public interest and OTC Clear's own interest, OTC Clear is required to ensure that the interests of the public prevail.
- 2.2 As an RCH, OTC Clear's Articles of Association, Clearing Rules and Clearing Procedures, fees and fee structure as well as any amendments to them are required to be approved by the SFC before they become effective. In addition, under section 61 of the SFO, no person may become a minority controller (i.e. holding 5% or more voting rights) of an RCH without the approval of the SFC. Furthermore, no person may hold 35% or more voting rights in OTC Clear unless that person is a recognised exchange controller under section 59 of the SFO.
- 2.3 HKEX, a publicly listed company in Hong Kong, holds 100% voting rights in OTC Clear. HKEX is the only exchange controller recognised by the SFC under the SFO. As a recognised exchange controller, HKEX has a statutory duty to ensure, among other things, that any RCH controlled by it (including OTC Clear) performs its duties competently. Accordingly, HKEX actively oversees and ensures the proper functioning of OTC Clear. HKEX exercises appropriate control and oversight over the performance of OTC Clear's functions and overall operations, financial arrangements, risk management, business and strategic direction.

Governance Structure

2.4 OTC Clear's governance structure comprises the OTC Clear Board and five committees and groups, including:

- (a) Risk Management Committee;
- (b) User Committee;
- (c) Default Management Group;
- (d) Disciplinary Committee; and
- (e) Disciplinary Appeals Committee,

which have been established to assist the OTC Clear Board in managing and operating OTC Clear.

2.5 The OTC Clear Board members are selected based on their skills, experience and knowledge of OTC products, risk management, or an understanding of exchange and/or clearing house business and processes. In defining the independence criteria for the INEDs of OTC Clear, OTC Clear has been guided by the requirements of the Hong Kong Listing Rules and the PFMI. When considering new appointments to the Risk Management Committee, User Committee and Default Management Group, OTC Clear ensures that they possess the appropriate knowledge and experience in the risk management areas or operations and business development of the OTC derivatives industry.

2.6 OTC Clear is subject to the oversight and scrutiny of the HKEX Board committees, including:

- (a) the statutory Risk Management Committee;
- (b) Audit Committee;
- (c) Nomination Committee;
- (d) Remuneration Committee; and
- (e) Investment Advisory Committee,

and such committees may be consulted and used to carry out the important functions of independent financial and operational audit, nomination of directors, oversight in the

determination of directors and staff remuneration, and advising on investment policies. Unless there is a sound reason for them to diverge, OTC Clear's policies in these areas are intentionally consistent with the HKEX Group policies.

OTC Clear Board and Committees

2.7 The OTC Clear Board currently consists of ten members, comprising four INEDs, two HKEX executives, one representative of a Client of a Clearing Member of OTC Clear or a clearing member of any other OTC CCP and three Non-Voting Ordinary Shareholder representatives. It has multiple roles and responsibilities as set out in its terms of reference, including:

- (a) determining OTC Clear's objectives and business plans and monitoring their implementation;
- (b) ensuring OTC Clear's compliance with all supervisory and oversight requirements;
- (c) establishing and overseeing the risk-management and internal control functions and making material risk decisions;
- (d) determining and monitoring capital and the operating budget;
- (e) providing accountability to the shareholders, Clearing Members and Clients as well as other stakeholders of OTC Clear; and
- (f) ensuring effective monitoring of senior management, providing performance feedback and determining compensation policies.

2.8 The roles and composition of various committees and groups that operate under the OTC Clear Board are summarised below:

- (a) **Risk Management Committee** – responsible for assisting the OTC Clear Board in discharging its risk-related responsibilities and advising it on the overall current and future risk tolerance and strategy of OTC Clear and arrangements that may impact the risk management of OTC Clear. It acts as an independent consultation panel of the OTC Clear Board on all important matters relating to the management of risks and receives regular reports from OTC Clear's Clearing Risk Management Department. It currently consists of three INEDs of OTC Clear, one Clearing Member representative and one representative of a Client of a Clearing Member of OTC Clear or a clearing member of any other OTC CCP. The Chairman of the committee is appointed by the OTC Clear

Board and is an INED of OTC Clear with sufficient knowledge of risk management matters;

- (b) **Default Management Group** – responsible for assisting OTC Clear in conducting the Default Management Process upon an event of default by a Clearing Member. It currently consists of the Head of FIC & OTC Clearing Risk Management Department, and four representatives and one back-up representative from Clearing Members for each product class. The Head of this Group is appointed by the OTC Clear Board and is the Head of FIC & OTC Clearing Risk Management Department or his nominee;
- (c) **User Committee** – responsible for advising the OTC Clear Board on product and market development and strategic issues relating to OTC Clear. It currently consists of one HKEX executive, twelve representatives from Non-Voting Ordinary Shareholders and one individual nominated by HKEX. Members are nominated based on their market and product familiarity and operational experience;
- (d) **Disciplinary Committee** – responsible for making first instance decisions on all disciplinary actions and proceedings against Clearing Members. Upon determining that disciplinary proceedings should be commenced, a Disciplinary Committee consisting of three members will be formed. The members to be appointed to the committee shall be drawn from the following pool of persons: the INEDs or client representative director(s) of OTC Clear; the INEDs of HKEX, market practitioners, industry participants or experts, lawyers or other suitable persons at the discretion of the OTC Clear Board; and
- (e) **Disciplinary Appeals Committee** – acts as an independent review body in respect of any decision of the Disciplinary Committee. When the Disciplinary Appeals Committee is called upon to consider a matter on appeal, a Committee consisting of three members will be formed. The members shall be drawn from the same pool of individuals as described above for the Disciplinary Committee except no person who was involved in adjudicating a particular matter in a Disciplinary Committee shall be appointed to the Committee hearing the matter on appeal.

2.9 The organisational structure of the HKEX Group, the terms of reference and composition of the OTC Clear Board and its committees/group, and HKEX Board and its respective committees are published on the HKEX website for access by the public. Please refer to section VI - List of Publicly Available Resources on the HKEX Website, for a list of publicly available resources about OTC Clear.

OTC Clear Management

- 2.10 OTC Clear's management consists of the employees, executives and staff within the HKEX Group who have the function of designing, implementing and administering the Clearing Rules and Clearing Procedures and managing OTC Clear and its clearing services. These include the OTC Clear Operations and Clearing Risk Management Departments. The Head of Clearing of the HKEX Group is the Chief Executive of OTC Clear. The senior management is responsible to and take their directions from the OTC Clear Board. The OTC Clear senior management team is responsible, among others, for making recommendations to, and implementing decisions of the OTC Clear Board, managing the operation of the company's business, ensuring OTC Clear's activities are consistent with its objectives and risk tolerance, and that internal control and risk management procedures are properly designed and executed.
- 2.11 The OTC Clear senior management is responsible for the effectiveness and efficiency of OTC Clear's internal control, risk management and corporate governance processes and its operations and organisational structures. HKEX Internal Audit Department, as the third line of defence and independent assurance function, performs periodic reviews of the effectiveness and efficiency of the abovementioned areas. It reports audit findings to the OTC Clear Board, OTC Clear senior management and to the HKEX Audit Committee and the Chief Executive of HKEX.

Conflicts of Interest Policy

- 2.12 OTC Clear has established its own conflicts of interest policy to deal with potential conflicts of interest issues between OTC Clear and its stakeholders including Clearing Members and Clients. Directors' conflicts of interest issues are addressed in OTC Clear's Articles of Association. To avoid conflicts in relation to committee members, OTC Clear includes in the terms of reference for all its committees, a provision requiring its members to declare any actual or potential conflicts of interest in relation to any matter under consideration at the earliest possible opportunity and in any case before they participate in discussion of that issue.

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.

Risk Management Framework

3.1 OTC Clear has identified the following risk types and has established appropriate risk management policies, procedures and controls to identify, measure, monitor and manage these risks:

- (a) **Legal risk** – as mentioned, OTC Clear has obtained a Hong Kong law opinion from an independent law firm to confirm that each of the material aspects of its activities and its Clearing Documentation are enforceable under the Hong Kong law. OTC Clear will obtain legal opinions from an independent law firm in respect of any relevant foreign jurisdictions as well as conflict of laws issues arising from the laws of such jurisdictions where necessary. The details are described under Principle 1 – Legal Basis;
- (b) **Liquidity risk** – OTC Clear assesses its liquidity needs daily, including stress testing and application of notional exchange risk limits, and maintains sufficient liquid resources to ensure that it is able to meet its payment and delivery obligations in a timely manner including in extreme but plausible market conditions. In 2017, OTC Clear commenced operations for the acceptance of Non-cash Collateral, in addition to cash Collateral. The details are described under Principle 7 – Liquidity Risk;
- (c) **Credit risk** – to minimise the risk that its Clearing Members would be unable to meet, in a timely manner, their payment and delivery obligations under their Contracts in accordance with Margin and Guarantee Fund contribution requirements, OTC Clear adopts risk-related Membership requirements such as the imposition of Minimum Capital Requirements on an on-going basis. In addition, OTC Clear would perform daily credit risk monitoring of its Clearing Members through a set of risk metrics to determine the risk limits, including the intra-day Variation Margin limits (i.e. the level of intra-day “credit risk tolerance” with respect to each Clearing Member). OTC Clear also conducts stress-testing regularly to ensure the sufficiency of its financial resources. New scenarios will be added for stress testing when necessary to identify risks arising and ensure their proper mitigation. OTC Clear also applies risk multipliers in the margin calculation to address relevant risks. Details are described under Principle 4 – Credit Risk, and further elaborated under Principle 6 – Margin and Principle 7 – Liquidity Risk;

Principle 3: Framework for the Comprehensive Management of Risks

- (d) **Market risk** – OTC Clear requires each of its Clearing Members to post Initial Margin, prior to the acceptance of Contracts for clearing. Initial Margin is intended to cover potential future exposures and mitigate the risk of losses in Contract value, arising from market movements during the close-out period of the Contracts in the event of a Clearing Member default. Variation Margin is imposed daily to cover current exposure. Each Clearing Member is required to make contributions to the Rates and FX Guarantee Fund to cover the Expected Uncollateralized Loss in the event of a default of the Clearing Member to whom OTC Clear has the largest exposure. The details are described under Principle 4 – Credit Risk and Principle 6 – Margin;
- (e) **Settlement risk** – payments between OTC Clear and its Clearing Members are made via the Hong Kong RTGS systems through five settlement banks appointed by OTC Clear. OTC Clear minimises settlement risk by imposing stringent appointment criteria and concentration limits for its settlement banks and conducting on-going monitoring of their performance. The details are described under Principle 9 – Money Settlements;
- (f) **General business risk** – OTC Clear adopts HKEX Group's Enterprise Risk Management Framework designed to identify, monitor and manage all risks including general business risk. OTC Clear monitors potential scenarios that may affect its financial position. External and internal factors including but not limited to regulatory developments, market conditions, business strategy and control procedures on spending are evaluated and reviewed regularly. The details are described under Principle 15 – General Business Risk;
- (g) **Custody and investment risk** – OTC Clear adopts stringent selection criteria when appointing settlement and custodian banks to safe-keep Clearing Member and, where relevant, Client Collateral as well as its own investment assets. From 2017, OTC Clear commenced operations for the acceptance of Non-cash Collateral from its Clearing Members in addition to cash deposits. The primary principles of OTC Clear's investment policy are to preserve capital, to remain sufficiently liquid and to minimize risk while optimizing return on investments. The details are described under Principle 16 – Custody and Investment Risk;
- (h) **Operational risk** – OTC Clear adopts HKEX Group's Enterprise Risk Management Framework designed to identify, monitor and manage all risks including operational risks. OTC Clear conducts a semi-annual exercise to assess the impact of each risk to its business, the likelihood of occurrence of each risk and the effectiveness of its existing controls. It performs ad hoc risk assessments following the introduction of new products, new services and system upgrades. To address operational risks that may affect its critical operations and services, OTC Clear has established a MCP setting out the

Principle 3: Framework for the Comprehensive Management of Risks

contingency and recovery procedures under specific scenarios. In addition, OTC Clear follows HKEX Group's physical and information security policies to manage potential system vulnerabilities and physical threats. The details are described under Principle 17 – Operational Risk; and

- (i) **Concentration risk** – OTC Clear monitors and manages money settlement concentration among its settlement banks through the use of the Herfindahl-Hirschmann Index (as described under Principle 9 – Money Settlements). Concentration limits are imposed on eligible Non-cash Collateral. Investment concentration is managed by imposing counterparty concentration limits (as described under Principle 16 – Custody and Investment Risk) and position concentration by imposing liquidity risk multipliers to, where necessary, increase Initial Margin requirements for concentrated portfolios (as described under Principle 6 – Margin). OTC Clear's risk management framework comprises policies and procedures pertaining to specific risk types. The risk monitoring and reviews are conducted holistically and include the identification and management of the interdependencies of counterparties.

Risk Management Policies, Procedures and Systems

- 3.2 OTC Clear employs a robust information and risk-control system to provide it with timely information to manage its risks. OCASS allows for the accurate and timely measurement and aggregation of risk exposure in real-time based on the most up-to-date market data from approved providers. OCASS enables OTC Clear to monitor its current exposure and potential future exposure to each Clearing Member's Portfolio and where relevant, Client Portfolio on a near real-time basis, by marking-to-market positions every 30 minutes during each clearing day (or every 15 minutes during volatile market conditions). OTC Clear uses OCASS to aggregate risk exposures across portfolios.
- 3.3 OCASS calculates the amount of Initial Margin, Variation Margin and Additional Margin (by marking-to-market all positions) for each Clearing Member, and notifies Clearing Members of Margin shortfalls in a timely manner. In addition, OCASS allows OTC Clear to apply credit limits (i.e. intra-day Variation Margin limits) and liquidity risk multipliers to increase Initial Margin requirements if required. The details are described under Principle 6 – Margin.
- 3.4 Various risk metrics are monitored on a daily basis as part of OTC Clear's risk monitoring framework including but not limited to:
 - (a) the adequacy of coverage of Clearing Members' Initial Margin and the Rates and FX Guarantee Fund against OTC Clear's exposures;

Principle 3: Framework for the Comprehensive Management of Risks

- (b) potential future exposure relative to historic patterns; and
- (c) stress-testing data relative to historical data compared across Clearing Members, assuming extreme but plausible market conditions.

Recovery and Wind Down Plan

- 3.5 OTC Clear has identified scenarios that may prevent it from being able to provide its critical operations and services as a CCP. The MCP is in place to provide for a recovery and orderly wind down of its business, if required. A wind down of its clearing services would be a decision of the last resort for the senior management of OTC Clear, and prior to making the decision to trigger the wind down process, the OTC Clear Board will duly and seriously consider its public and legal duties as an RCH under the SFO and may raise additional capital from its shareholders or third parties, and revise its business strategies and services and cost structure.
- 3.6 If OTC Clear decides to trigger the wind down process, a Rates and FX Clearing Termination Event will occur. OTC Clear will liquidate its clearing portfolios in accordance with the Clearing Rules and Clearing Procedures. All obligations of OTC Clear and its Clearing Members in respect of any Contracts between them shall cease and be replaced with the obligations to pay or receive the termination amounts. The time required to implement an orderly wind down of its business is expected to be around six months although OTC Clear maintains sufficient financial resources at all times to cover at least 12-months' operating expenses, as described under Principle 15 – General Business Risk.

Review of the Effectiveness of Risk Management Policies, Procedures and Systems

- 3.7 The Head of FIC & OTC Clearing Risk Management Department meets at least on a quarterly basis with the Risk Management Committee and the OTC Clear Board to provide an update on OTC Clear's risk exposures and on the effectiveness of its risk management framework. The review includes the monitoring of the risk intensity fluctuation including:
- (a) the Margin requirements of a Clearing Member relative to the Capital of the Clearing Member;
 - (b) the projected stress-test losses of a Clearing Member relative to the Capital of the Clearing Member;
 - (c) the size of a Clearing Member's exposures relative to the various risk limits on the related House Position Account and where relevant, Client Position Accounts; and

Principle 3: Framework for the Comprehensive Management of Risks

(d) the back-testing results for the Initial Margin model.

3.8 In 2017, an independent consultant was engaged for the purposes of completing the annual review of OTC Clear's risk models. OTC Clear senior management will consult the Risk Management Committee in relation to any proposed material changes to the risk management framework before they are submitted to the OTC Clear Board for approval.

Principle 4: Credit Risk

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

Management of Credit Exposure to Clearing Members

4.1 OTC Clear has implemented a comprehensive risk management framework to manage its credit exposures to the potential default of a Clearing Member. It adopts the following controls to measure, monitor and manage its current and potential future exposures to Clearing Members:

- (a) **Membership requirements** – each Clearing Member enters into a Membership Agreement with OTC Clear and must comply with the Membership requirements as set out in the Clearing Rules and Clearing Procedures (as described under Principle 18 - Access and Participation Requirements);
- (b) **Position Account monitoring** – OTC Clear's Clearing Risk Management Department routinely reviews each Clearing Member's House Position Accounts and where relevant, Clearing Member's Client Position Accounts;
- (c) **Capital strength** – OTC Clear's Clearing Risk Management Department ensures that each Clearing Member has sufficient Capital to meet its Minimum Capital Requirement. If a Clearing Member fails to meet its Minimum Capital Requirement (taking into account the risk profile of a given Clearing Member) and remedy it within a specific timeframe, OTC Clear may suspend or terminate its Membership or declare the Clearing Member in default; and
- (d) **Credit risk monitoring** – each Clearing Member's creditworthiness is evaluated daily by OTC Clear's Clearing Risk Management Department taking into account a set of risk metrics including respected and publicly available credit ratings,

CDS spread, the relevant Sovereign CDS spread, financial leverage, Capital ratios and operational incidents.

OTC Clear assigns each Clearing Member a risk score based on the risk metrics and may take risk mitigating actions such as:

- adjusting the level of the intra-day Variation Margin limit (i.e. the amount of “credit tolerance” provided to the Clearing Member);
- disallowing the Clearing Member to withdraw excess Collateral; and
- requiring the Clearing Member to post only cash to meet its Margin and Rates and FX Guarantee Fund contribution requirements.

4.2 **Resources for Managing Credit Exposures** – these are the sources of funds available to OTC Clear to cover losses arising from the default(s) of Clearing Member(s), which comprise the Margin Balance and the Rates and FX Guarantee Resources described under sub-paragraphs (a)-(d) and paragraphs 4.3 to 4.4 below. The application sequence of these resources (i.e. the default waterfall) in the event of default is described in greater detail under Principle 13 – Participant-default Rules and Procedures.

- (a) **Initial Margin** – this covers potential future exposures with at least a 99% single-tailed confidence level over a five-day holding period for positions in the House Account and a seven-day holding period for positions in the Client Account. Clearing Members are required to post sufficient Initial Margin for a Contract or Portfolio of Contracts before it is accepted for clearing. In addition, Initial Margin requirements are recalculated daily during the end-of-day settlement cycle and any shortfall needs to be satisfied in a timely manner (generally within the settlement window on the next clearing day). Please refer to the timeline of a typical clearing day’s activities in paragraph 39 of Section III. General Background on OTC Clear;
- (b) **Variation Margin** – this covers current exposures through mark-to-market payments on cleared Contracts processed during the end-of-day settlement cycle. Routine Intra-day VM calls are issued if the current exposure to a Clearing Member’s House Position Account or where relevant, Client Position Account exceeds the intra-day Variation Margin limit set by OTC Clear. In addition, Ad Hoc Intra-day VM calls may be made if there is significant Margin erosion in a Clearing Member’s House Position Account or where relevant, Client Position Account. Note that Contracts are marked-to-market half-hourly during each clearing day. OTC Clear has the ability to increase the frequency

of the mark-to-market processing to 15-minute intervals during volatile market conditions; and

- (c) **Additional Margin** – this is imposed on Clearing Members at OTC Clear’s discretion if, for instance, a Clearing Member fails to comply with the Minimum Capital Requirement or OTC Clear determines that there are wrong-way risk concerns arising from the Clearing Member’s Contracts. Additional Margin will also be collected to cover potential market volatility arising from significant foreign market movements during Hong Kong holidays (Holiday Margin).

Further details about OTC Clear’s Margin methodology are described under Principle 6 – Margin.

- (d) The Rates and FX Guarantee Resources are as follows:
- **Rates and FX Guarantee Fund** – the aggregate value of all Clearing Members’ funded contribution amounts;
 - **OTC Clear Contribution** – OTC Clear’s contributions to the Rates and FX Guarantee Resources; and
 - **CM Unfunded Contribution Amount** – Non-Defaulting Clearing Members’ funding commitments capped at two times the value of their funded contribution amounts. Being unfunded, these amounts are not assumed to be available in the default stress testing assumptions described below.

4.3 The Rates and FX Guarantee Fund covers the remaining 1% or the “tail” risk (beyond the Initial Margin coverage over potential losses with at least a 99% single-tailed confidence interval) over a multi-day holding period arising from the default of the Clearing Member and its affiliates, taking into account the risk exposures of its Client positions if relevant, that would potentially cause the largest aggregate credit exposure(s) to OTC Clear in extreme but plausible market conditions. The Minimum Rates and FX Guarantee Fund contribution is HK\$50 million per Clearing Member. The adequacy of the Rates and FX Guarantee Fund is stress-tested daily and re-sized at least monthly and on an ad hoc basis, using a combination of historical scenarios and theoretical scenarios (as described under paragraphs 4.6 to 4.7 below).

4.4 The Rates and FX Guarantee Fund is sufficient to cover the default of the Clearing Member and its affiliates, taking into account the risk exposures of its Client positions if relevant, that would potentially cause the largest aggregate credit exposure(s) to OTC Clear in extreme but plausible market conditions. This level of cover is adequate

under the PFMI as OTC Clear does not have a complex risk profile and is not currently systemically important in multiple jurisdictions for the following reasons:

- (a) it operates only in Hong Kong, has Clearing Members that are either incorporated or have branches in Hong Kong, and has no links with other financial market infrastructures in other jurisdictions;
- (b) it currently clears only interest rate swaps and non-deliverable currency forwards that are standardized and for which a deep and liquid market exists; and
- (c) the OTC derivatives market in Hong Kong and the volume cleared by OTC Clear only represent a small proportion of global markets.

Management of Credit Exposure from the Payment, Clearing and Settlement Processes

- 4.5 OTC Clear adopts the following measures to manage the credit exposure arising from its payment, clearing and settlement processes:
- (a) all payments/settlements are made through OTC Clear's settlement banks via the RTGS systems operated by HKICL;
 - (b) strict financial, operational and business eligibility criteria are adopted for the appointment of OTC Clear's settlement banks and regular reviews are conducted by OTC Clear in respect of their regulatory compliance, creditworthiness and capitalization, access to liquidity and operational reliability (as described under Principle 9 – Money Settlements); and
 - (c) monitoring of the CDS Spreads, respected and publicly available credit ratings and Capital ratios of OTC Clear's settlement banks and the use of the Herfindahl-Hirschmann Index to assess the concentration risk of money flows among them (as described under Principle 9 – Money Settlements). The concentration limits take into account the overall credit risk exposures of OTC Clear to individual obligors (as described under paragraph 16.5(a) of Principle 16 – Custody and Investment Risk).

Stress Testing – Sufficiency of Financial Resources

- 4.6 OTC Clear ensures the sufficiency of its financial resources as set out in Chapter 6.3 of the Clearing Procedures by:
- (a) stress-testing and back-testing the Margin models daily;
 - (b) stress-testing the adequacy of the Rates and FX Guarantee Fund daily (as described under paragraphs 4.7 and 4.8 below) and re-sizing it monthly; and
 - (c) conducting reverse stress-testing quarterly on the Margin and Rates and FX Guarantee Fund models to ensure that all extreme but plausible scenarios have been included in the set of stress-test scenarios, and to add new scenarios if necessary.
- 4.7 The stress-testing described above is conducted using data from a wide range of historical and theoretical scenarios that take into account relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons and simultaneous pressures in funding and asset markets in a variety of extreme but plausible market conditions, including October 1987 Black Monday, the 1998 Asian Financial Crisis, the 2003 SARS

epidemic, the 2008 Global Financial Crisis (including the Lehman Brothers default), hypothetical extreme but plausible scenarios simulated by OTC Clear's Clearing Risk Management Department to encompass correlation breakdown among different asset classes and across various tenors, and hypothetical currency devaluations. Under the stress testing model, hypothetical scenarios include but are not limited to idiosyncratic stress scenarios per currency or reference rate, providing a spectrum of forward looking scenarios. In addition, through reverse stress testing, OTC Clear can identify potential stress scenarios to adjust, alter or add scenarios to current daily routine stress testing.

- 4.8 The effectiveness and appropriateness of stress-testing assumptions and parameters are assessed at least monthly, or more frequently if necessary, by OTC Clear's Clearing Risk Management Department. The Head of FIC & OTC Clearing Risk Management Department meets at least quarterly with the Risk Management Committee and the OTC Clear Board to review the stress test results and to assess the adequacy of coverage of the Initial Margin and the Rates and FX Guarantee Resources. Stress testing results are reported monthly to the HKEX Statutory Risk Management Committee. In 2017, OTC Clear engaged an independent consultant to complete its annual assessment and validation of its risk models.

Allocation of Credit Losses and Replenishment of Financial Resources

- 4.9 OTC Clear's allocation of credit losses arising from Clearing Member default(s) and replenishment of its financial resources are described in greater detail under Principle 13 – Participant-default Rules and Procedures.

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.

Eligible Collateral and Valuation

5.1 As mentioned, in 2017 OTC Clear commenced operations for the acceptance of Non-cash Collateral in addition to cash in Eligible Currencies. Policies and principles are in place for assessing the liquidity of the current Eligible Collateral types. Such policies and principles will be maintained and extended when new types of Eligible Collateral are introduced in the future.

5.2 Eligible Collateral must fulfil the following criteria:

- (a) **Low credit risk** – with a high credit quality against an appropriate benchmark rate;
- (b) **Low liquidity risk** – the ability to be liquidated in an active secondary market in a reasonable time frame;
- (c) **Low market risk** – with low price volatility; and
- (d) **No specific wrong way risk** – not likely to lose value in the event that the Clearing Member defaults.

5.3 Eligible Collateral is marked-to-market every 15 to 30 minutes during each clearing day. OTC Clear's Clearing Risk Management Department monitors applicable liquidity metrics such as trading volumes and/or bid-ask spreads of each Collateral type on a monthly basis. The list of Eligible Collateral will be reviewed quarterly with the Risk Management Committee.

Haircut Methodology

5.4 All types of Collateral are subject to haircuts which take into account the liquidity, price volatility, potential future exposures, and market conditions that may affect the perceived risk attributes of the Collateral. The haircut for cash Collateral in HKD is determined based on the bid/ask spread level (which reflects the market liquidity) of HKD. For cash Collateral in non-HKD currencies and Eligible Non-cash Collateral, haircuts are determined by referencing the highest 99.7% value-at-risk over a range of

look back periods to ensure that at least 99% of all observations have been taken into account.

- 5.5 The sufficiency of haircuts is also validated by comparing: (i) the bid/ask spread of the Collateral; and (ii) the value-at-risk calculation of OTC Clear's Collateral portfolio with five-year historical data on a rolling basis in addition to historical and hypothetical extreme but plausible stress scenarios. The validation is performed monthly and on an ad hoc basis under volatile market conditions.
- 5.6 The inclusion of historical and hypothetical stress scenarios from extreme but plausible market conditions for haircut validation enables OTC Clear to mitigate pro-cyclicality by setting a larger haircut in times of low market volatility. This buffer can reduce the need for continuous haircut adjustments or triggering Additional Margin calls which may exacerbate an already stressed market condition.

Concentration Limits

- 5.7 Collateral eligibility, haircuts and concentration limit policies are reviewed annually by the Risk Management Committee and any amendments are subject to the OTC Clear's Board approval. As mentioned in paragraph 3.8, in 2017 OTC Clear engaged an independent consultant to complete the annual review of its risk management framework, which included the validation of OTC Clear's Collateral policies.

Collateral Management

- 5.8 Pledged cash is transferred on an outright basis from Clearing Members to OTC Clear, settled via the RTGS system and held on deposit with commercial banks in Hong Kong (i.e. OTC Clear's appointed custodians). Cash Collateral, whether in satisfaction of the Margin or the Rates and FX Guarantee Fund requirements, is transferred to OTC Clear on an outright basis and therefore forms part of OTC Clear's assets. Non-cash Collateral provided by Clearing Members in satisfaction of the Margin requirements will be by way of security interest. Non-cash Collateral collected will not be re-hypothecated, re-invested or reused. HKEX Treasury Department is responsible for investing cash Collateral according to OTC Clear's investment policy as described under Principle 16 – Custody and Investment Risk. OTC Clear on a monthly basis, pays a return to Clearing Members at a rate specified by OTC Clear in respect of the cash Collateral provided to meet the Margin requirements. For Eligible Non-cash Collateral provided by a Clearing Member, OTC Clear will distribute an amount representing any income it has received in respect of any Non-cash Collateral, taking into account the deduction required to reflect any accommodation charges, administration costs or commitment fees for credit lines incurred by OTC Clear in respect of such Non-cash Collateral.

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.

- 6.1 To cover its current and potential future exposures, Margin levels established by OTC Clear are commensurate with the risks and attributes of each product, portfolio, and market that OTC Clear serves. The types of Margin collected by OTC Clear from its Clearing Members include Initial Margin, Variation Margin and Additional Margin.
- 6.2 Total Margin requirements take into account the value of any Collateral previously posted and are calculated and collateralised separately in respect of each House Position Account. Save for the end-of-day Variation Margin call which must be satisfied by 11:00 am on the next clearing day, all other Margin calls must be satisfied within one hour of demand.

Initial Margin

- 6.3 Initial Margin is used to mitigate OTC Clear's potential future exposure (i.e. the inherent market risk) to a Contract or portfolio of Contracts and needs to be satisfied before a Contract is accepted for clearing by OTC Clear. It covers possible losses in the event of a Clearing Member default under normal market conditions, between the time of the last Variation Margin payment on that Contract and the time it takes to hedge, close out or transfer the Contract upon that Clearing Member's default and, where relevant, the time it takes to port Client positions and related Collateral upon that Clearing Member's default.
- 6.4 It is calculated based on a value-at-risk model with at least a 99% single-tailed confidence level over a five-day holding period for Contracts recorded in a House Position Account and a seven-day holding period for Contracts recorded in a Client Position Account. The model uses a range of historical and hypothetical, extreme but plausible scenarios to simulate the performance of each Contract and fluctuations in the market value of each Clearing Member's cleared portfolio. Returns generated by the Initial Margin model are scaled by placing exponentially more weight on recent market data to allow for a better representation of current market volatility.
- 6.5 The Initial Margin model takes into the account the following key parameters and inputs:
- (a) **Close-out period** – Initial Margin is designed to cover five-day's profit and loss (PnL) of a Clearing Member's portfolio under normal market conditions and seven-day's PnL for a Client portfolio. It is assumed that when a Clearing

Member defaults, the defaulting Clearing Member's Initial Margin can cover two days of missed Margin payments, two days for Hedging, one day for the Auction of its portfolio and, where relevant, two days for porting Client positions and related Collateral. In addition, OTC Clear may impose a liquidity risk multiplier to increase the Initial Margin requirement to reflect an increased liquidation horizon for portfolios that are larger, less liquid and/or more concentrated;

- (b) **Confidence level** – OTC Clear has validated through back-testing, that Initial Margin achieves a single-tailed confidence interval in excess of 99% for Contracts recorded in a House Position Account and, where relevant, Client Position Account with respect to the estimated distribution of potential future exposure; and
- (c) **Sample period** – a combination of the following components reflecting both current and longer term market volatilities:
 - five-year historical data which provides a profit and loss distribution and a wide correlation matrix amongst Contracts and underlyings;
 - some older historical data (beyond five years) to reflect extreme past volatility e.g. 2003 SARS epidemic and 2008 global financial crisis; and
 - some hypothetical scenarios generated by OTC Clear to capture extreme but plausible events.

6.6 The Notional Exchange Risk Multiplier will be applied in margin calculation for Clearing Members with sizable directional risk in their cleared cross currency swap portfolios. This aims to address the additional FX conversion risk and costs arising from potential default of such Clearing Members. OTC Clear conducts regular poll of bid/ask spread data or requests other information from Clearing Members to determine the level of the multiplier and the appropriate threshold for sizable exposures.

6.7 OTC Clear checks the robustness of the Initial Margin model by back-testing it with much larger data sets (i.e. going back over 40 years), covering extreme but plausible market conditions.

Variation Margin

6.8 Variation Margin mitigates OTC Clear's current exposure to the Contracts due to daily market fluctuations as measured by marking-to-market of Contracts every 30 minutes during each clearing day (or every 15 minutes during volatile market conditions). It is collected through a Routine Intra-day VM Call if the current exposure to a Clearing

Member's Contracts recorded in its House Position Account exceeds the Intra-day Variation Margin limit set by OTC Clear.

- 6.9 Variation Margin calls are made at least twice a day:
- (a) one Routine Intra-day VM Call is made at 2:15 pm on each business day and must be settled within one hour; and
 - (b) one end-of-day Variation Margin Call is made at 9:30 pm on each clearing day and must be settled by 11:00 am on the following clearing day.
- 6.10 These Variation Margin calls are made automatically by OCASS and issued to Clearing Members via the Web Portal. In addition, OTC Clear may make Ad hoc Intra-day Variation Margin Call under volatile market conditions if necessary.

Additional Margin

- 6.11 Additional Margin is imposed on Clearing Members at OTC Clear's discretion if for instance, a Clearing Member fails to comply with the Minimum Capital Requirement or OTC Clear determines that there are wrong way risk concerns arising from the Clearing Member's Contracts. It covers the potential market volatility arising from significant foreign market movements during Hong Kong holidays (Holiday Margin). OTC Clear will also impose Notional Exchange Failure Margin on Non-delivering Clearing Members upon the occurrence of Notional Exchange Failure. The Notional Exchange Failure Margin aims to collateralise the indemnification liability that the Non-delivering Clearing Member owes to OTC Clear as a result of it effecting any Mitigating Measures in respect of that Notional Exchange Failure.

Price Data

- 6.12 The price data used by OTC Clear's Margin system is supplied by reputable market data providers and updated every 15 minutes. It aggregates dealer/broker quotes and data on trades from market participants that represent a wide swathe of the market, in products which are the same or similar to the instruments cleared by OTC Clear. To ensure that the price data it obtains from a market data provider is reliable, OTC Clear's Clearing Risk Management Department compares the data with that obtained from another market data provider and bid-ask spreads on trades submitted for clearing to check if there is any distorted or missing data.

Portfolio Margining

- 6.13 OTC Clear allows offsets in Margin requirements across products within a House Position Account and, where relevant, Client Position Account. In applying Margin offsets across products, OTC Clear identifies correlations amongst underlyings and amongst Contracts, during periods of actual and simulated market stress by modelling the future performance of each Contract using a range of historical data and hypothetical stress scenarios. OTC Clear does not currently have any cross-margining arrangements with other CCPs.

Back-testing, Sensitivity Analysis and Review

- 6.14 OTC Clear conducts daily back-testing of the Initial Margin model by calculating and comparing a hypothetical Initial Margin amount to the hypothetical profit and loss for each House Position Account and, where relevant, each Client Position Account using the past five years' market data, with the assumption that all Contracts were held for a continuous period of five clearing days. If the hypothetical Initial Margin is insufficient to cover the hypothetical loss on a House Position Account, one exceedance will be recorded. If the number of exceedances exceeds the Initial Margin risk tolerance level over a specific period of time, OTC Clear will take the following actions:

- (a) evaluate the source of back-testing exceedances and recalibrate the Initial Margin model parameters (e.g. confidence level, number of scenarios etc.) when necessary; and
- (b) run another back-test to check Initial Margin coverage.

- 6.15 If the recalibration of the model and subsequent back-testing do not result in a reduction of the number of exceedances within the risk tolerance level, OTC Clear will revise the Margin model appropriately.

- 6.16 In conducting sensitivity analysis of the Initial Margin model coverage, OTC Clear takes into account a wide range of parameters including but not limited to:

- (a) data for hypothetical scenarios by doubling the volatility of the most-volatile periods that the market has experienced; and
- (b) out-of-sample data such as back-testing derivatives referencing other underlyings which are not cleared by OTC Clear currently. OTC Clear reviews recent market data monthly to identify if any new scenarios should be added to the Margin model.

- 6.17 As mentioned in paragraph 3.8, in 2017 OTC Clear engaged an independent consultant to complete the annual review of its risk management framework, which will include the validation of the Margin methodology and back-testing model. Any

material changes to the Margin methodology must be reviewed in consultation with the Risk Management Committee before obtaining the OTC Clear Board's final approval.

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.

Liquidity Risk Management Framework

7.1 The major sources of OTC Clear's liquidity risks and the corresponding mitigating measures are as follows:

- (a) **Default of Clearing Members** – OTC Clear manages the liquidity and credit risks of its Clearing Members by imposing Membership requirements as described under Principle 18 – Access and Participation Requirements and conducting daily risk monitoring of Clearing Members as described under Principle 4 – Credit Risk;
- (b) **Operational or financial failure of settlement banks or custodians** – OTC Clear has stringent selection criteria for its settlement banks and custodians, monitors the concentration of money flows amongst them and conducts a regular review of their financial standing and operational performance as described under Principle 9 – Money Settlements;
- (c) **Operational failure of the payment system (RTGS systems)** – as described under Principle 8 – Settlement Finality, OTC Clear conducts its money settlements through the RTGS systems. The RTGS operator (HKICL) maintains backup facilities to deal with the failure of the primary system;
- (d) **Entities that take on multiple roles** – where a Clearing Member or its Affiliate is a settlement bank, custodian, obligor or liquidity provider of OTC Clear, OTC Clear imposes stricter counterparty concentration limits in relation to their settlement or custody services as described under Principle 16 – Custody and Investment Risk. OTC Clear reduces the settlement bank or custodian's intra-day Variation Margin limit (in its capacity as a Clearing Member) if its credit risk is material; and
- (e) **Illiquidity of investments or Collateral** – OTC Clear's investment strategies aim to ensure that investment portfolios are sufficiently liquid at all times. This

is described in greater detail under Principle 16 – Custody and Investment Risk. Daily liquidity management is under the tight control of OTC Clear’s Clearing Risk Management Department and the HKEX Treasury Department. Currently, OTC Clear only invests in cash deposits. Non-cash Collateral provided by Clearing Members will not be re-hypothecated, re-invested or reused as described under Principle 5 – Collateral.

- (f) **Failure of Notional exchanges** – to mitigate the liquidity risk arising from failure of notional exchanges in the cross currency swaps clearing, OTC Clear applies the Notional Exchange Risk Limits to Clearing Members. When a Notional Exchange Risk Limit is fully utilised, new trades of Cross Currency Swaps will not be accepted unless the Clearing Member posts additional cash Collateral of the excess amount in the same currency as the Notional Exchange Risk Limit. OTC Clear also monitors its notional exchange liquidity requirements and conducts liquidity stress testing on a daily basis.

Liquid Resources

7.2 OTC Clear’s liquid resources currently include:

- (a) the Margin Balance provided by Clearing Members for the purpose of satisfying their Margin and Rates and FX Guarantee Resources requirements;
- (b) committed intraday liquidity facilities available to OTC Clear to meet its liquid resource requirements arising from the settlement of notional exchanges of cross currency swap trades.
- (c) OTC Clear’s contribution to the Rates and FX Guarantee Resources of HK\$156 million; and
- (d) retained earnings arising from its clearing business.

7.3 OTC Clear manages its liquidity needs by monitoring both its settlement and funding flows, and by conducting stress testing on Clearing Members’ payment obligations. Based on the observed cash flow patterns and stress test results as described under paragraph 7.6 below. OTC Clear determines its minimum liquid resource requirements, forecasts future cash flow requirements, ensures that there are sufficient liquid bank balances, and minimises currency and maturity mismatch between cash receipts and payments.

7.4 The Notional Exchange Risk Limits are supported by committed intraday liquidity facilities available to OTC Clear covering the potential Notional Exchange Failures of two Clearing Members concurrently. OTC Clear stresses failure(s) of the liquidity

provider(s) as described under paragraph 7.1(d) above and in Principle 16 – Custody and Investment Risk.

7.5 The minimum liquid resource requirements of OTC Clear are maintained in same-day funds (overnight cash deposits), at its settlement banks. The size of OTC Clear's minimum liquid resource requirement is recalculated daily and is in an amount equal to the aggregate of:

(a) the greater of:

- the largest stress test value calculated in HKD amongst the Clearing Members and its affiliates, taking into account the risk exposures of its Clients positions if relevant (calculated using the stress testing methodology as described under paragraph 7.6 below); and
- the HKD equivalent of the largest stress test value within the relevant Contract Currencies (i.e. HKD, USD, EUR and CNY (offshore)) amongst the Clearing Members;

that would generate the largest multi-day payment obligation(s) to OTC Clear, plus a buffer of 10% for exigencies; and

(b) the amount of excess Collateral available for Clearing Members' withdrawal.

Stress Testing – Liquid Resources Requirement

7.6 OTC Clear determines the amount and tests the sufficiency of its liquid resources through stress testing on a daily basis. Liquidity stress tests are conducted across each Contract in each Clearing Member's House Position Accounts, and where relevant, Client Position Accounts, to simulate their performance under a wide range of historical and theoretical scenarios that include, but not be limited to, the default of the Clearing Member and its affiliates that would generate the largest aggregate liquidity obligation for OTC Clear in extreme but plausible market conditions. The scenarios 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, e.g. October 1987 Black Monday, the 1998 Asian Financial Crisis, the 2003 SARS epidemic, the 2008 Global Financial Crisis (including Lehman Brothers default) and hypothetical extreme but plausible scenarios simulated by OTC Clear's Risk Management Department. OTC Clear conducts reverse stress testing regularly to ensure that extreme scenarios that are plausible have been included in the set of liquidity stress test scenarios. In addition, ad hoc testing is conducted when products

cleared or markets served display high volatility, become less liquid, or the size or concentration of positions held by Clearing Members increases significantly.

- 7.7 In addition, OTC Clear accounts for funding pressures from asset valuation losses of any Collateral type, placed by a Clearing Member, by incorporating stress scenarios when setting haircuts. Furthermore, on a daily basis, OTC Clear accounts for stress scenarios for simultaneous funding pressures arising from a Clearing Member incurring stress losses on Collateral as well as losses on its cleared derivatives exposures as described under Principle 5 – Collateral.
- 7.8 The effectiveness and appropriateness of liquidity stress-testing assumptions and parameters are assessed at least monthly by OTC Clear's Clearing Risk Management Department. The Head of FIC & OTC Clearing Risk Management Department meets at least quarterly with the Risk Management Committee and the OTC Clear Board to review the stress test results and to assess the adequacy of liquid resources. Any amendments to OTC Clear's liquidity risk policy or investment policy must be submitted to the OTC Clear Board for approval. Stress testing results are reported to the HKEX statutory Risk Management Committee on a monthly basis. As mentioned in paragraph 3.8, OTC Clear engaged an independent consultant to complete the annual review of its risk management framework, which will include the validation of the stress testing model.

Replenishment of Liquid Resources

- 7.9 In the event that the Rates and FX Guarantee Fund is utilised to set-off losses caused by a Clearing Member default, each Non-Defaulting Clearing Member may be required to replenish its Rates and FX Guarantee Fund contributions. Non-Defaulting Clearing Members are obligated to make further contributions, in Eligible Currencies, capped at two times of their funded contribution amounts. The replenishment of liquid resources employed during a stress event is described under Principle 13 – Participant-default Rules and Procedures.

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.

- 8.1 The Contracts cleared by OTC Clear are currently all settled in cash and OTC Clear conducts its money settlements (including coupon, notional exchange, Margin, Rates and FX Guarantee Fund and clearing fee payments etc.) with its Clearing Members relating to such Clearing Members' house business and/or client business through the RTGS systems operated by HKICL. The RTGS systems provide prompt final settlement on the day of value, intra-day and in real-time. OTC Clear is not a member of the RTGS systems and has appointed five Hong Kong licensed banks which are RTGS members to act as its settlement banks. A Clearing Member either has to be a member of the RTGS systems or otherwise appoint a member of the RTGS systems to carry out its money settlements.
- 8.2 The RTGS systems, supporting four currencies: HKD, USD, EUR and CNY (offshore), are systems designated under the CSSO, which provides statutory backing to the finality of settlement for transactions made through systems designated under the Ordinance by protecting the settlement finality from insolvency law or any other laws. All interbank payments are settled through the RTGS systems continuously on a deal-by-deal basis. With the statutory backing of the CSSO and in accordance with the RTGS rules, payment transactions settled through the RTGS systems are regarded as final and irrevocable once the settlement accounts concerned have been so debited and credited, and a payment cannot be revoked from this point of time.

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 risks arising from the use of commercial bank money.

- 9.1 As described under Principle 8 – Settlement Finality, OTC Clear conducts its money settlements with its Clearing Members through the RTGS systems operated by HKICL. The RTGS systems support four currencies: HKD, USD, EUR and CNY (offshore) and the settlement finality and irrevocability of the payments settled through the RTGS systems are guaranteed by the CSSO. Among the four currencies, only HKD is settled in central bank money across the book of the HKMA. The other three currencies are settled through the books of three commercial banks appointed by the HKMA as the Settlement Institution for each of the three other currencies. The banks are The Hong Kong and Shanghai Banking Corporation Limited for USD, Standard Chartered Bank (Hong Kong) Limited for EUR and Bank of China (Hong Kong) Limited for CNY (offshore). As described under Principle 8, OTC Clear is not a member of the RTGS systems and has appointed five Hong Kong licensed banks as its settlement banks to handle payments of the Contract currencies with its Clearing Members through the RTGS systems.
- 9.2 To manage the credit and liquidity risk exposure to the funds held or processed by its settlement banks, OTC Clear has stringent criteria in selecting its settlement banks. A settlement bank of OTC Clear must be a HKMA-licensed bank with at least HK\$10 billion capital, a minimum credit rating of A3 or equivalent, and proven operational capability and reliability, such as its performance record in acting as a settlement bank for other clearing houses.
- 9.3 OTC Clear conducts a due diligence review of its settlement banks on an on-going basis, at least annually. The review includes an assessment of the bank's regulatory compliance, a review of its creditworthiness and capitalization levels, its access to liquidity and its operational reliability. OTC Clear uses the Herfindahl-Hirschmann Index to measure and assess the concentration level of the settlement amounts to each settlement bank relative to OTC Clear's overall settlement exposure. If the assessment results are unfavourable, OTC Clear may take appropriate remedial actions, e.g. appointing additional banks or replacing a settlement bank.

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.

As Contracts cleared by OTC Clear are not physically settled, Principle 10 – Physical Deliveries is not applicable.

Principle 11: Central Securities Depositories

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

As OTC Clear is not a CSD, Principle 11 – Central Securities Depositories is not applicable.

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.

- 12.1 OTC Clear eliminates settlement risk arising from the cash payments relevant to the notional exchange settlements, including both the initial and final notional exchanges of a cross currency swap transaction by adopting the payment-versus-payment mechanism (“PVP”). PVP is a mechanism in a foreign exchange settlement system linked with RTGS system to ensure both legs of a foreign exchange transaction are settled simultaneously to eliminate Herstatt risk.

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.

Clearing Member Default Rules and Procedures

- 13.1 The Clearing Rules and Clearing Procedures of OTC Clear define the actions that OTC Clear can take following the default of one or more Clearing Members. An Event of Default is defined as any event or circumstance which leads OTC Clear to determine that a Clearing Member is or appears to be unable or likely to become unable, to meet its obligations in respect of the Clearing Documentation and/or one or more Contracts to which it is a party. The events that constitute sufficient grounds for OTC Clear to determine that an Event of Default has occurred are set out in the Clearing Rules. These events include, but are not limited to:
- (a) failure by a Clearing Member to pay or deliver any amounts when due under the Clearing Documentation;
 - (b) failure by a Clearing Member to comply with Regulatory Capital Requirements;
 - (c) failure by a Clearing Member to take action required by OTC Clear to ensure compliance with the Clearing Documentation; and
 - (d) occurrence of Insolvency Proceedings with respect to a Clearing Member.
- 13.2 The OTC Clear Board or its delegate (the Chief Executive of OTC Clear) may determine whether an Event of Default has occurred relating to failure to pay, breach of rules of the relevant regulatory authority or revocation or suspension of the relevant regulatory authorization and insolvency of a Clearing Member. In all other types of default, the senior management of OTC Clear will endeavour to consult the Risk Management Committee prior to making a determination.
- 13.3 If OTC Clear determines that an Event of Default has occurred, it will send the Defaulting Clearing Member a Notice of Default and inform other Non-Defaulting Clearing Members and the SFC. Following the delivery of the Notice of Default, OTC Clear may take the following steps in respect of the Defaulting Clearing Member:
- (a) to discharge the Defaulting Clearing Member's rights and obligations under its Contracts;

- (b) to minimise losses or potential losses to OTC Clear as a result of its default; and
- (c) to calculate a net amount owing between OTC Clear and the Defaulting Clearing Member.

Default Management Process

13.4 The Default Management Process is set out in detail in Part V of the Clearing Rules and Chapter 8 of the Clearing Procedures. The Default Management Process is designed for OTC Clear to take steps to discharge the Defaulting Clearing Member's rights, obligations and liabilities under or in respect of one or more Contracts, to minimise losses or potential losses to OTC Clear and to complete the Default Management Process in calculating the net sum payable by or to each Defaulting Clearing Member. OTC Clear enjoys various statutory protections from insolvency laws in Hong Kong, including section 45 of the SFO, which provides that the proceedings of OTC Clear as a RCH take precedence over insolvency laws in Hong Kong.

13.5 The Default Management Process includes:

- (a) mobilisation of the Default Management Group to advise OTC Clear on matters relating to termination or close-out of Contracts, e.g. Hedging and conducting an Auction of the Defaulting Clearing Member's Contracts. The Default Management Group consists of representatives of Clearing Members and the Head of FIC & OTC Clearing Risk Management Department as described under Principle 2 – Governance;
- (b) hedging of the Defaulting Clearing Member's Contracts to reduce OTC Clear's exposure to these Contracts until the completion of the Auction process (With the amended Clearing Rule 1803, OTC Clear may execute hedging instruments with entities that are not Clearing Members for a defaulting Clearing Member's cross currency swap trades, provided that those Hedging instruments would not form part of the Auction Portfolio (i.e. the relevant transaction will expire before or shortly after the Auction process)) ;
- (c) porting Client positions and related collateral of the Defaulting Clearing Member to a Replacement Clearing Member;
- (d) Auction of the Defaulting Clearing Member's Contracts to Non-Defaulting Clearing Members; and
- (e) allocation of any losses following Auctions by utilising the Total Available Resources detailed in paragraph 13.6 below.

Total Available Resources and the Default Waterfall

- 13.6 OTC Clear is entitled to apply its Total Available Resources to meet its payment obligations in a timely manner as they fall due and to cover losses following the Auction(s) of a Defaulting Clearing Member's portfolio. The components of, and the application sequence, of the Total Available Resources (i.e. the default waterfall) over the loss allocation process is described below:
- (a) the Defaulting Clearing Member's Margin Balance including Initial Margin, Variation Margin and Additional Margin;
 - (b) the Defaulting Clearing Member's Rates and FX Guarantee Fund contribution;
 - (c) OTC Clear First Contribution – HK\$150 million;
 - (d) the Rates and FX Guarantee Fund contribution balance of Non-Defaulting Clearing Members;
 - (e) OTC Clear Second Contribution – a tranche with an initial value of HK\$6 million, to be built up to a maximum value of HK\$650 million (from accrued investment income generated from the Rates and FX Guarantee Resources); and
 - (f) the aggregate value of contributions in respect of Rates and FX Assessments of each Non-Defaulting Clearing Member.
- 13.7 If some or all of the Rates and FX Guarantee Fund is utilised within 20 business days following a Clearing Member default (and extended by another 20 business days for each subsequent default), OTC Clear has the right to request additional contributions to the Rates and FX Guarantee Fund from each Non-Defaulting Clearing Member on a non-voluntary basis, provided that the non-voluntary contributions are capped at two times each Non-Defaulting Clearing Member's last calculated Rates and FX Guarantee Fund contribution requirement immediately prior to the default.
- 13.8 To the extent that the OTC Clear First Contribution and/or the OTC Clear Second Contribution have been utilised during the Default Management Process, OTC Clear will replenish the OTC Clear First Contribution and the OTC Clear Second Contribution to their original value prior to the default event(s) using its retained earnings whilst ensuring its compliance with the regulatory capital requirements. For the avoidance of doubt, OTC Clear will only replenish the OTC Clear Second Contribution if the OTC Clear First Contribution has been replenished in full.

Principle 13: Participant-default Rules and Procedures

- 13.9 If losses arising from a default exceed the Total Available Resources, where necessary, OTC Clear may invoke the following processes (in order) beyond the Default Management Process:
- (a) **Loss Distribution Process** – on each OTC Clear Clearing Day during the Loss Distribution Period, OTC Clear will apply a haircut on Variation Margin payable to Clearing Members to enable OTC Clear to fulfil its payment obligations, therefore affording the best chance for OTC Clear’s orderly recovery;
 - (b) **Voluntary recapitalisation** – request Non-Defaulting Clearing Members to make voluntary contributions to the Rates and FX Guarantee Fund. Whilst a Non-Defaulting Clearing Member has no obligation to provide such contribution, the voluntary recapitalization process aims to keep OTC Clear solvent and avoids triggering the limited recourse wind down of the clearing services; or
 - (c) **Limited recourse wind down** – wind down OTC Clear’s clearing services and close-out all Contracts. All obligations of OTC Clear and the remaining Clearing Members in respect of any contract between them shall cease to exist and be replaced with the obligation to pay a termination amount(s). The close-out value for each Contract shall be determined in accordance with section 10.1 of the Clearing Procedures. Clearing Members have no recourse to the capital or any other assets of OTC Clear and have no right to institute steps to wind down OTC Clear.
- 13.10 OTC Clear consulted prospective Clearing Members on the Clearing Rules and the Clearing Procedures with a particular focus on the default procedures. OTC Clear has prepared the Default Management Manual, which provides further details on the roles and responsibilities of various stakeholders and how decisions and communication should be made in different scenarios. OTC Clear will conduct a default management drill with all of its Clearing Members at least once annually and following material changes to the default procedures. The results of the drill will be reported to the Risk Management Committee and the OTC Clear Board, and will be published on the HKEX website.
- 13.11 The Default Management Process will be reviewed by the Risk Management Committee and an independent consultant following any significant changes to the arrangements. Any changes recommended by either of them must be approved by the OTC Clear Board and any changes to the Clearing Documentation require approval by the SFC.

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.

- 14.1 OTC Clear currently offers inter-dealer clearing services and Client Clearing Services for OTC derivatives transactions. OTC Clear Client Clearing Services are established under Client Account segregation and porting rules which protect a Clearing Member's Client positions and related Collateral from the default of that Clearing Member. OTC Clear employs an account structure that enables it readily to identify positions of a Clearing Member's Clients. OTC Clear maintains Client positions in individual segregated client accounts (Client Clearing Category 1 Account Basis and Client Clearing Category 1 Collateral Account respectively) or in net omnibus client accounts (Client Clearing Category 2 Account Basis and Client Clearing Category 2 Collateral Account respectively).
- 14.2 A Client's Contracts and Collaterals in an individual segregated client account (Client Clearing Category 1 Account) are segregated from other Clients and from the relevant Clearing Member's House Account. In the event of the Clearing Member default, porting of the Contracts and Collaterals in such individual segregated client account is subject to Porting Instructions being in place before the occurrence of the default event and subsequent consent of the relevant Replacement Clearing Member.
- 14.3 A Client's Contracts and Collaterals in a net omnibus client account (Client Clearing Category 2 Account) are co-mingled with that of other Clients sharing the same net omnibus client accounts but segregated from other Clients and from the relevant Clearing Member's House Account. In the event of default of the relevant Clearing Member, Contracts and Collateral will only be ported if all Clients in the same net omnibus client accounts have valid Porting Instructions in place before the occurrence of the default event, appointing the same Replacement Clearing Member and subsequently, that Replacement Clearing Member consents to the porting of all Contracts and Collaterals in that net omnibus client account.
- 14.4 In respect of such net omnibus client account, payment obligations due in respect of all Contracts registered in such net omnibus client account will be netted together before porting. Any net sums owed to OTC Clear will be discharged by applying cash Collateral or the sale proceeds of Non-cash Collateral of the relevant net omnibus client account. Any net sums owed by OTC Clear will be apportioned in the manner set out in the Clearing Rules and paid directly to the Clients as Client Entitlement. Clients sharing a net omnibus client account should be aware that their gains, if any, and their Collateral will be utilised to offset any losses of other Clients sharing the same

net omnibus client account. The Client could pursue recovery of any shortfall through its claim against the Defaulting Clearing Member upon termination of the ISDA Master Agreement with the Defaulting Clearing Member on the porting date.

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.

Identification of Business Risks

- 15.1 The OTC Clear Board, with the support of the OTC Clear management, uses the HKEX Group's Enterprise Risk Management Framework to conduct business risk assessments on an on-going basis. The assessment includes the identification of internal and external factors that could impair OTC Clear's financial position, an evaluation of their impacts and the likelihood of occurrence. OTC Clear establishes and implements key financial and internal controls and plans to mitigate, eliminate, monitor, and manage the risks.
- 15.2 OTC Clear has identified external and internal factors that pose business risks to OTC Clear including:
- (a) the pace and direction of legislative reform in Hong Kong and in overseas jurisdictions and the impact this may have on user-participation in the OTC Clear clearing services;
 - (b) market conditions and the pace of development of CNY (offshore) denominated products, a developing market segment in which OTC Clear expects to have a competitive advantage;
 - (c) the effectiveness of OTC Clear's business strategy;
 - (d) operational issues that may impact OTC Clear's expenditure and investments;
 - (e) the intra-day liquidity required for supporting the day-to-day settlement of the notional exchanges of cross currency swaps and
 - (f) the investment risk in its own assets. Guidelines to monitor this risk are described under Principle 16 – Custody and Investment Risks.

Financial Resources for Business Operations

- 15.3 As part of its on-going compliance requirements as an RCH, including compliance with the PFMIs, and to ensure it can continue operations and services as a going concern, OTC Clear maintains at all times net current assets funded by equity in an amount sufficient to cover its projected total operating expenditure for at least the following six months, and net current assets funded by equity or loans from HKEX (not being short-term loans or loans that are repayable on demand) sufficient to cover its projected total operating expenditure for at least the following 12 months. To facilitate the SFC's effective supervision of OTC Clear's compliance with these financial requirements, OTC Clear provides the SFC on a monthly basis with its capital and operating expenditures and cash flow forecasts for the following 12 months.
- 15.4 OTC Clear has determined that these financial resources are sufficient to cover the time required to achieve a recovery or orderly wind-down of OTC Clear's critical operations and services under stressed market conditions if this is necessary. Their adequacy is re-assessed periodically along with the estimates of the time span for wind-down activities whenever there is a significant change in liquidity, size and maturity of the cleared portfolio, the types of products cleared, and the operations and risk management frameworks.
- 15.5 OTC Clear has developed and maintains the MCP for the wind-down of its critical operations and services, including the liquidation of its clearing portfolio in accordance with the Clearing Rules and Clearing Procedures. OTC Clear's critical operations and services include trade registration processes, risk modelling, margining, collateral management, settlement processes, Default Management Processes, the core systems of OTC Clear and its various external interfaces.
- 15.6 In the event that additional financial resources are required, at the OTC Clear Board's discretion, OTC Clear may implement plans to raise additional capital by issuing new shares to existing and/or new shareholders.
- 15.7 OTC Clear will further consider compliance of its recovery and resolution plan upon:
- (a) the issuance of the Hong Kong regulatory authorities recovery and resolution arrangements for financial institutions, including FMIs; and
 - (b) CPMI-IOSCO's additional guidelines in respect of recovery and resolution of FMIs.

Principle 16: Custody and Investment Risk

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.

Custody of Assets

- 16.1 As mentioned, in 2017 OTC Clear commenced operations for the acceptance of Non-cash Collateral from its Clearing Members in addition to cash Collateral. OTC Clear appoints multiple creditworthy commercial banks licensed in Hong Kong as its custodians subject to selection criteria and various ongoing monitoring and concentration limits.
- 16.2 The custodian selection criteria are largely the same as those for OTC Clear's settlement banks which as described under Principle 9 – Money Settlements. Custodians appointed by OTC Clear must have robust accounting practices, safekeeping procedures and internal controls that ensure optimal protection of the assets placed by OTC Clear. Custodians must have a minimum credit rating of A3 (or equivalent) from any recognized rating agency and must be licensed banks regulated by the HKMA.
- 16.3 Under the custodian bank agreements entered into by OTC Clear, custodian banks cannot exercise any rights of set-off or consolidation or combination of accounts or any similar rights or any liens or other security interest in respect of any OTC Clear accounts, including those for holding OTC Clear's corporate funds, Margin funds or Rates and FX Guarantee Resources. All custodians are currently situated in Hong Kong, providing OTC Clear with prompt access to its assets without time-zone related operational risks.
- 16.4 OTC Clear conducts on-going risk assessments of its exposures to each custodian. The assessments are on an aggregated basis in case the custodians have multiple roles and relationships with OTC Clear. OTC Clear may appoint additional custodians to diversify concentration risk and reduce exposure to individual custodians as described under Principle 7 – Liquidity Risk.

Investment Strategy

- 16.5 OTC Clear invests its own assets under a prudent investment policy. OTC Clear's investment strategy follows the investment principles set out by the HKEX Investment Advisory Committee and approved by the OTC Clear Board. The investment principles for OTC Clear are as follows:

- (a) **Risk management** – investments are diversified and in high-quality assets to minimize the credit and concentration risks. The concentration limit takes into account the overall credit risk exposures of OTC Clear to individual obligors that have multiple relationships with OTC Clear, e.g. an obligor is a Clearing Member as well as a settlement bank or custodian of OTC Clear. OTC Clear will not invest its own and Clearing Members' assets in Clearing Members' own securities or those of their Affiliates. The only exception is placement of cash deposits with appointed custodians which may be Clearing Members of OTC Clear;
- (b) **Preservation of capital** – safety of principal is one of the priority principles of OTC Clear's investment strategy. Investments are undertaken in a manner that seeks to ensure the preservation of capital and allows for quick liquidation with little, if any, adverse price effect;
- (c) **Liquidity** – investment portfolios have to be sufficiently liquid at all times and liquidity management is tightly controlled on a daily basis; and
- (d) **Return** – return on investments is optimized without compromising the other important investment principles and strategies.

16.6 Currently, OTC Clear invests only in cash deposits for corporate funds, Margin and Rates and FX Guarantee Resources.

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.

Operational Risk Management Framework

17.1 OTC Clear's operational risk management framework consists of the following elements:

- (a) **Enterprise Risk Management Framework** – OTC Clear adopts HKEX Group's Enterprise Risk Management Framework to systematically identify, assess, monitor and control/mitigate material risks inherent in the business and operational processes including operational risk from both internal and external sources, on an on-going basis. OTC Clear conducts a quarterly exercise to review and update its risk register of material risks. New risk assessments are conducted following the introduction of new products and expansion into new markets. OTC Clear establishes and implements key controls and treatment plans to mitigate, eliminate, monitor, or manage the risks; and
- (b) **MCP** – the OTC Clear MCP sets out the contingency and recovery procedures following a disruption to OTC Clear's critical functions, under specific contingency scenarios. The MCP has the following objectives:
 - to resume critical functions within two hours following disruptive events;
 - to complete end-of-day procedures and payments, even under contingency situations; and
 - to identify the status of all transactions at the time of the disruption with certainty and in a timely manner.

17.2 When designing the MCP, OTC Clear took into account interdependencies and external links with Clearing Members (and their Clients where applicable), ATRS, the RTGS systems, settlement banks, Non-cash Collateral custodian(s), SWIFT, market data providers, the OTC Clear communications network and utility suppliers. The MCP addresses an extensive range of disruptive event scenarios, such as loss of

access to workplace premises, power outages, system failures (both internal and external), natural disasters and extreme market movements. It sets out escalation and reporting procedures with various stakeholders, including the OTC Clear Board, regulators, Clearing Members (and their Clients where applicable) and service providers.

- 17.3 OTC Clear's clearing platform operates within a primary and a secondary site. The two sites run on a duplicate set of hardware, software and applications. The sites are located in different districts of Hong Kong and are a considerable distance apart to minimise the chances of both sites being affected by the same incident. The primary site has a built in redundancy design with no single point of failure, i.e. the service on a failed server can be restarted on its corresponding backup server automatically. The secondary site runs in standby mode and the start-up of backup systems for core mission critical clearing functions can be completed within two hours, once the disaster recovery process for the primary site commences.

Review, Audit and Testing

- 17.4 The OTC Clear Board is responsible for establishing and overseeing the risk-management function, and putting in place appropriate internal control systems to manage and monitor risks associated with OTC Clear's business and operations. Additionally the Board ensures the integrity of OTC Clear's accounting, financial and operational controls and endorses an annual review of the risk management framework.
- 17.5 The MCP is tested regularly or after significant modifications or changes to the systems or related functions. Testing results are reported to the OTC Clear Board and the Risk Management Committee. The OTC Clear Board reviews the OTC Clear MCP annually. Any improvements or non-conformity to the MCP identified from the testing will be addressed by an action plan if necessary.
- 17.6 OTC Clear is subject to periodic internal audits by the HKEX Internal Audit Department. OTC Clear's senior management will put in place an action plan to address any internal control deficiencies that are identified. HKEX Internal Audit Department tracks the implementation status and provides independent status reporting to the HKEX Audit Committee and the OTC Clear Board.

Operational Reliability Objectives and Capacity Scalability

- 17.7 The operational reliability objectives of OTC Clear are defined in the service agreements with its external service providers, the MCP, and its internal policies and procedures. Quantitative objectives include system availability and performance targets. The primary resilience objective is to ensure that system recovery can be

achieved within two hours. Specific service requirements are established with external service providers.

- 17.8 OTC Clear's clearing platform has scalability and load balancing features that allow it to support higher volumes by upgrading and expanding hardware without significant architectural changes. The system capacity is scaled based on the projected clearing volumes and a capacity buffer has been put in place to handle potential stress volumes.
- 17.9 The clearing volumes of OTC Clear, the system capacity and performance are monitored monthly to ensure adequate headroom is available and that any necessary system upgrades or capacity extensions can be completed on a timely basis before maximum capacity levels are reached.

Physical and Information Security Policies

- 17.10 OTC Clear follows HKEX Group's physical and information security policies that identify, assess, and manage potential physical and system vulnerabilities and threats. The physical security measures have been established to guard against unauthorised access, attacks, intrusions, and to minimise the impact of potential natural disasters to physical sites (e.g. business offices and data centres). The HKEX Information Security and Business Continuity Department, which is independent of Information Technology Division, oversees the information security strategy and policy for all application systems within the HKEX Group. The information security policy sets out implementation safeguards in relation to system configurations and management and is designed with reference to international standards.

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.

Membership Requirements and On-going Monitoring

18.1 The Membership requirements of OTC Clear are risk-based, transparent and comparable to international standards. They are clearly disclosed in Part II of the Clearing Rules and Chapter 2 of the Clearing Procedures of OTC Clear and on the HKEX website. Access control is necessary to ensure that only institutions that have the ability to manage risks and meet their obligations to OTC Clear can become Clearing Members. However, OTC Clear understands that unreasonable and overly-strict access requirements may lead to limited participation in the CCP and as a result create excessive concentration of risk among a small number of Clearing Members and high liquidity risk in distressed situations. To ensure fair and open access, OTC Clear does not impose any minimum book size requirements in its admission criteria.

18.2 The Membership requirements and the on-going compliance requirements are summarised below:

- (a) **Regulatory status** – a Clearing Member must have established a place of business in Hong Kong and be an Authorised Institution (i.e. a licensed bank, restricted licence bank (**RLB**) or deposit-taking company (**DTC**)) regulated by the HKMA or a Licensed Corporation regulated by the SFC;
- (b) **Minimum Capital Requirement** – a Clearing Member must have minimum Capital of:
 - HK\$10 billion, in the case of a licensed bank;
 - HK\$390 million, in the case of a Hong Kong-incorporated RLB or DTC; or
 - HK\$390 million, in the case of a Licensed Corporation.

In addition, OTC Clear has risk-based Capital requirements such that Clearing Members should maintain Capital in an amount not less than:

- its Expected Uncollateralized Loss (stress test value of its positions less its Margin Balance); and

- its contribution requirement to the Rates and FX Guarantee Resources;
- (c) **Operational requirements** – a Clearing Member must be capable of handling the clearing operations processes, including having appointed at least one ATRS to submit its trades for clearing, established connection to the Web Portal for communication with OTC Clear, having the ability to conduct money settlements via the RTGS systems directly or by appointing a member of the RTGS systems and appointed a custodian for Non-cash Collateral settlements if such Clearing Member elects to deliver Non-cash Collateral to OTC Clear to satisfy Margin requirements;
- (d) **Risk management requirements** – Clearing Members need to have adequate internal risk management systems and procedures and must provide details of their internal risk modelling and risk management frameworks. Clearing Members must deliver Collateral with an aggregate value of at least HK\$50 million to the Rates and FX Guarantee Fund and nominate representatives with the required skills and expertise to participate in the Default Management Group; and
- (e) **Legal requirements** – OTC Clear will obtain relevant legal opinions in specific jurisdictions to assess the legal risks and any conflicts of law issues before admitting entities incorporated in those jurisdictions as its Clearing Members.

18.3 Currently, OTC Clear accepts direct Clearing Members and offers indirect clearing arrangements, i.e. Client Clearing Services, for those who do not qualify for direct membership or do not wish to be direct Clearing Members, as described under Principle 19 – Tiered Participation Arrangements. In short, a Clearing Member providing Client Clearing Services to its Clients shall be liable to OTC Clear and be responsible for all its obligations as principal in respect of the Client Clearing Category 1 Accounts and Client Clearing Category 2 Accounts registered in its name. The Head of FIC & OTC Clearing Risk Management Department reviews the access criteria and requirements with the Risk Management Committee at least annually. Any changes or updates to Membership requirements require the OTC Clear Board's approval.

18.4 To monitor Clearing Members' on-going compliance with the Membership requirements, Clearing Members are required to notify OTC Clear in specific circumstances prescribed in the Clearing Rules, namely, in the event of:

- (a) any non-compliance with Capital requirements;
- (b) any significant matters relating to their clearing activities;
- (c) any non-compliance with the Clearing Documentation;

- (d) any corrections or updates to information previously provided to OTC Clear;
- (e) any changes to organisational structure; and
- (f) updates to financial information.

Suspension and Termination of Membership

- 18.5 Pursuant to Chapter 6 of the Clearing Rules, OTC Clear may suspend the Membership of a Clearing Member if:
- (a) the Clearing Member defaults;
 - (b) disciplinary proceedings have been brought against the Clearing Member;
 - (c) a Force Majeure Event or Illegality affecting the Clearing Member occurs; or
 - (d) it is necessary to do so in order to protect the interests of OTC Clear and/or other Clearing Members.
- 18.6 When the Membership of a Clearing Member is suspended:
- (a) all monies payable to OTC Clear still have to be paid on time;
 - (b) no new Contracts can be entered into by the Clearing Member; and
 - (c) OTC Clear may liquidate the affected Clearing Member's Contracts and port Client positions and related Client Collateral of the suspended Clearing Member in consultation with the Risk Management Committee.
- 18.7 Pursuant to the Clearing Rules, OTC Clear may terminate the Membership of a Clearing Member if:
- (a) the Clearing Member exceeds any Position Limit set by OTC Clear and fails to remedy the situation;
 - (b) of the Clearing Member's Membership is suspended;
 - (c) the Clearing Member defaults; or
 - (d) the OTC Clear Disciplinary Committee or Disciplinary Appeals Committee decides that termination is warranted.
- 18.8 Prior to the Membership termination, the Clearing Member has to continue to meet its obligations to OTC Clear. Following the Membership termination, Collateral and contributions to the Rates and FX Guarantee Fund will be returned to the Clearing Member in accordance with the Clearing Rules.

Principle 19: Tiered Participation Arrangements

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

- 19.1 In 2017, OTC Clear introduced Client Clearing Services under a principal clearing model. Under this model, a Clearing Member faces OTC Clear as principal to a Contract and the Clearing Member, in turn, faces its Client as principal in a back-to-back transaction. OTC Clear has no direct contractual relationship with the underlying Client and Clearing Members are liable to OTC Clear and responsible for all obligations of their Clients. Through client on-boarding procedures and ongoing participation requirements, OTC Clear will collect and maintain appropriate and sufficient underlying Client information from Clearing Members to allow it to carry out its risk management responsibilities.

Principle 20: FMI Links

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

- 20.1 Currently, OTC Clear has established three links with other FMIs, namely:
- a) a trade reporting link with Over-the-counter Derivatives Trade Repository of the HKMA;
 - b) a trade reporting link with DTCC Data Repository (U.S.) LLC.; and
 - c) it has appointed the CMU of the HKMA as its custodian for custody of Non-cash Collateral posted to it by its Clearing Members.
- 20.2 OTC Clear has put in place appropriate measures to identify, monitor and manage link-related risks in these three established trade repositories where appropriate.
- 20.3 Although OTC Clear settles payments through the Hong Kong RTGS systems, it is not a direct participant and has not established links with any of the Hong Kong RTGS systems. As described under Principles 8 – Settlement Finality and 9 – Money Settlements, OTC Clear settles RTGS payments through its settlement banks.

Principle 21: Efficiency and Effectiveness

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

Design of the Clearing Model

- 21.1 OTC Clear has developed its legal, operational and risk management structures to be consistent with international regulatory requirements and standards and has benchmarked itself against the designs of major international CCPs. OTC Clear has engaged professional firms to validate its design, including independent law firms and consulting firms to advise on the legal structure and the risk management frameworks.
- 21.2 In establishing OTC Clear, views and feedback from the Hong Kong OTC derivatives community were obtained on the design of OTC Clear's operations and risk management framework, the scope of clearable products and the system infrastructure. In addition, the Clearing Rules and Clearing Procedures went through multiple rounds of consultation with potential Clearing Members prior to the launch of the clearing services and their comments and suggestions were taken into account as appropriate.
- 21.3 To ensure that OTC Clear is responsive to market needs on an on-going basis, as described under Principle 2 – Governance, there are Clearing Member and Client representatives on the OTC Clear Board and its committees to provide advice and input from the users' perspective. OTC Clear continues to make use of a range of channels, including seminars, workshops, one-on-one meetings, and surveys to solicit and gather market feedback.

Goals and Objectives

- 21.4 As an RCH, OTC Clear is given several specific statutory duties and responsibilities in the SFO. In summary, the objectives of OTC Clear are to ensure, so far as is reasonably practicable, that there are orderly, fair and expeditious clearing and settlement arrangements for any Contract cleared or settled through its facilities, that risks associated with its business and operations are managed prudently, that it operates its facilities in accordance with its Clearing Rules and Clearing Procedures as approved by the SFC and that it can at all times provide and maintain facilities to meet contingencies for the conduct of its business. In addition, OTC Clear has set goals and objectives in the areas of:
- (a) **Minimum service level targets** – including adequate system capacity, scalability and the operation of an effective business continuity plan;

- (b) **Risk-management expectations** – the ability to maintain sufficient liquid resources for daily operations and during recovery or orderly wind-down of critical operations and services etc.; and
- (c) **Business priorities** – the expansion of product coverage and acceptable Collateral types and the seeking of CCP recognition in overseas jurisdictions.

21.5 The SFC supervises OTC Clear's on-going compliance with the statutory duties and objectives and other obligations of an RCH. The OTC Clear Board, with the support of the OTC Clear management and in consultation with the Risk Management Committee and the User Committee, reviews and evaluates the overall achievements of its goals and objectives on an on-going basis.

Client Clearing Services

21.6 After taking into account paragraphs 21.1 to 21.3, OTC Clear operates in a principal model in provision of Client Clearing Services and offer two types of Client accounts: Client Clearing Category 1 Account and Client Clearing Category 2 Account. Please refer to Principle 19 – Tiered Participation Arrangements.

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.

- 22.1 OTC Clear uses internationally accepted communications procedures and protocols for exchanging messages across systems.
- 22.2 OTC Clear communicates with its Clearing Members, settlement banks, Non-cash Collateral custodian and ATRS using TCP/IP protocol. Clearing Members access OTC Clear's clearing platform, OCASS, through a Web Portal (known as OASIS), which is a browser-based terminal developed on standard web-based technology.
- 22.3 OTC Clear uses internationally accepted SWIFT messages for sending/receiving payment instructions to/from its Clearing Members, Non-cash Collateral custodian and settlement banks. Trades submitted from ATRS to OTC Clear are in Financial products Markup Language (**FpML**) format, which is internationally recognized and promoted within the ISDA community as the standard of choice for electronic communication, information sharing and transactions dealing in OTC financial derivatives and structured products.

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.

Rules and Procedures

- 23.1 OTC Clear has clear and comprehensive Clearing Rules and Clearing Procedures that are disclosed to Clearing Members and the public. When establishing its Clearing Rules and Clearing Procedures, OTC Clear benchmarked the proposed contents, arrangements and practices against those of international CCPs and took into account the feedback received from prospective Clearing Members and market participants. The Clearing Rules and Clearing Procedures document the operation, risk management measures and fee structure of OTC Clear in general as well as the handling of various non-routine events, including;
- (a) Force Majeure events;
 - (b) Illegalities;
 - (c) the occurrence of an Event of Default of a Clearing Member or of OTC Clear;
 - (d) the Loss Distribution Process following a DMP event;
 - (e) the winding down of OTC Clear;
 - (f) bad-weather events; and
 - (g) business continuity procedures.
- 23.2 Any amendments to the Clearing Rules or Clearing Procedures require approval from the OTC Clear Board and the SFC, and for risk management-related provisions, prior consultation with the Risk Management Committee. The User Committee and Clearing Members will be consulted if the changes to the Clearing Rules or Clearing Procedures are substantive or involve a change of policy or business direction of OTC Clear.

Disclosure

- 23.3 Clearing Members are informed through circulars of any changes or updates to the Clearing Rules and Clearing Procedures. A revised and updated version is posted on the HKEX website for access by its Clearing Members and the public.
- 23.4 In addition to the Clearing Rules and Clearing Procedures, OTC Clear documents and publishes information on the system's design and operations. This includes technical details about the connectivity to and operation of the Web Portal, information on the what-if Margin simulation tool, sample data and report files and templates, and information on the rights and obligations of Clearing Members in various packs, user manuals and guides. The information is available on the HKEX website and allows prospective Clearing Members to understand the OTC Clear services and the risks they would face by participating in OTC Clear. OTC Clear may provide training to Clearing Members as necessary and offers a telephone hotline for enquiries about OTC Clear's services during office hours.
- 23.5 This first disclosure document was completed in July 2014 and is published on the HKEX website. The document will be updated following material changes to OTC Clear and its services, systems or environment, and at least every two years.
- 23.6 Please refer to section VI. List of Publicly Available Resources for a list of information, materials, and statistics on cleared transaction volumes and values published on the HKEX website.

Principle 24: Disclosure of Market Data by Trade Repositories

A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.

As OTC Clear is not a TR, Principle 24 – Disclosure of Market Data by Trade Repositories is not applicable.

VI. List of Publicly Available Resources on the HKEX Website

Operations and Risk Management Frameworks

1. Introduction to OTC derivatives clearing and settlement services
(<http://www.hkex.com.hk/eng/prod/clr/otclrsett/otcdcnss.htm>)
2. List of clearable products
(<http://www.hkex.com.hk/eng/prod/clr/otclrsett/otcedpoc/otcedpoc.htm>)
3. Risk management framework
(http://www.hkex.com.hk/eng/market/rm/rm_otc/otcrm.htm)
4. Collateral management
(<http://www.hkex.com.hk/eng/prod/clr/otclrsett/chaicut.htm>)
5. Fees schedule
(<http://www.hkex.com.hk/eng/market/clr/otclr/clearingfee.htm>)
6. Operation calendars and operating hours
(<http://www.hkex.com.hk/eng/market/clr/otclr/opscal.htm>)
7. Clearing statistics
(<http://www.hkex.com.hk/eng/stat/clearstat/otcstat/stats.htm>)
8. Further details about CSSO on the HKMA website
(<http://www.hkma.gov.hk/eng/key-functions/banking-stability/oversight.shtml>)

Legal and Regulatory Information

9. Clearing Rules and Clearing Procedures of OTC Clear
(<http://www.hkex.com.hk/eng/rulesreg/clearrules/otc/rulesotc.htm>)
10. Clearing Member notices
(<http://www.hkex.com.hk/eng/market/partcir/otcclear/2014otccirculars.htm>)
11. PFMI disclosure document
(<http://www.hkex.com.hk/eng/prod/clr/otclrsett/PFMI.htm>)

Governance Arrangements

12. Organisational structure of the HKEX Group
(http://www.hkexgroup.com/-/media/HKEX-Group-Site/Hr/org_chart.pdf)
13. List of Non-Voting Ordinary Shareholders of OTC Clear
(<http://www.hkex.com.hk/eng/prod/clr/otcclearsett/fsholders.htm>)
14. List of directors of OTC Clear
(<http://www.hkex.com.hk/eng/exchange/org/principalsubsid.htm>)
15. List of members of OTC Clear committees
(<http://www.hkex.com.hk/eng/exchange/org/comsubsid.htm>)
16. Terms of reference of OTC Clear Board and committees
(http://www.hkex.com.hk/eng/exchange/org/terms_ref/terms%20of%20reference.htm)
17. List of directors of HKEX
(<http://www.hkex.com.hk/eng/exchange/org/boardirect/boardirect.htm>)
18. List of members of HKEX committees
(<http://www.hkex.com.hk/eng/exchange/org/commember.htm>)
19. Terms of reference of HKEX committees
(http://www.hkex.com.hk/eng/exchange/org/terms_ref/terms%20of%20reference.htm)

Membership

20. List of Clearing Members
(<http://www.hkex.com.hk/eng/market/clr/otcclear/memberlist.htm>)
21. Membership criteria
(http://www.hkex.com.hk/eng/market/hkex_part/criteria/admission_criteriaotcc/otcmember.htm)
22. Membership application information
(http://www.hkex.com.hk/eng/market/hkex_part/criteria/OTCapplication/otcmemapp.htm)

Clearing Platform – OCASS

23. System information and user guides
(<http://www.hkex.com.hk/eng/market/clr/otcclear/clearingsys/clearingsys.htm>)

