

Hong Kong Monetary Authority Central Moneymarkets Unit

Principles for Financial Market Infrastructures Disclosure for Central Moneymarkets Unit

October 2018

Principles for Financial Market Infrastructures: Disclosure for Central Moneymarkets Unit

Responding Institution(s):	Prepared by Central Moneymarkets Unit Payment Systems Operation Division Financial Infrastructure Department Hong Kong Monetary Authority
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List of abbreviations used in this Disclosure

AI Authorized Institution BCP Business Continuity Plan

BIS Bank for International Settlements

BO Banking Ordinance CB Clearing Bank

CCDC China Central Depository & Clearing Co., Ltd.

CCP Central Counterparty

CHATS Clearing House Automated Transfer System

CIBM China Interbank Bond Market
CMT CMU Member Terminals
CMU Central Moneymarkets Unit

CMUP Central Moneymarkets Unit Processor

CPMI Committee on Payments and Market Infrastructures
CPSS Committee on Payment and Settlement Systems (name

changed to CPMI from 1 September 2014)

CSD Central Securities Depository

CSSO Clearing and Settlement Systems Ordinance (retitled as

PSSVFO from 13 November 2015)

DvP Delivery versus Payment

EFBN Exchange Fund Bills and Notes
EFO Exchange Fund Ordinance

FID Financial Infrastructure Department FMIs Financial Market Infrastructures

FMIO Financial Market Infrastructures Oversight

FTS File Transfer Service HKD Hong Kong Dollar

HKCC HKFE Clearing Corporation Limited HKICL Hong Kong Interbank Clearing Limited

HKMA Hong Kong Monetary Authority

HKSCC Hong Kong Securities Clearing Company Limited

HSBC The Hongkong and Shanghai Banking Corporation Limited

ICSD International Central Securities Depository

KSD Korea Securities Depository LC Licensed Corporation MPF Mandatory Provident Fund

OTC Clearing Hong Kong Limited

PBOC People's Bank of China

PFMI Principles for Financial Market Infrastructures

PSOD Payment Systems Operation Division

PSSVFO Payment Systems and Stored Value Facilities Ordinance

PvP Payment versus Payment RD Recognized Dealer

RMB Renminbi

RTGS Real Time Gross Settlement

SEOCH SEHK Options Clearing House Limited SFC Securities and Futures Commission

SHCH Shanghai Clearing House SI Settlement Institution

SSS Securities Settlement System

TA Transfer Agent

TDCC Taiwan Depository & Clearing Corporation USD US Dollar

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I. Executive Summary

The Central Moneymarkets Unit (CMU), established in 1990, is owned by the Hong Kong Monetary Authority (HKMA) and operated as a unit of the HKMA to provide clearing, settlement and custodian service for debt securities issued by both public and private sector entities denominated in Hong Kong dollar and other major currencies. Over the years, the CMU has also developed external links with regional and international debt securities settlement systems to assume a more global reach, allowing overseas investors to hold and settle debt securities lodged with the CMU, and local investors to hold and settle debt securities lodged with overseas systems.

The HKMA plays a key role in developing a safe and efficient financial infrastructure in Hong Kong, which is essential to maintaining the stability and integrity of the monetary and financial system. The CMU has been operating smoothly since its launch.

As a central securities depository (CSD) and a securities settlement system (SSS) in Hong Kong, the CMU is subject to the laws of Hong Kong. As a designated clearing and settlement system under the Payment Systems and Stored Value Facilities Ordinance (PSSVFO), the CMU is also under the statutory oversight of the HKMA (via the Financial Market Infrastructure Oversight team (FMIO team)); and all transactions effected through the CMU enjoy statutory backing for settlement finality.

The CMU provides services to participants who comprise financial institutions subject to the supervision of a financial regulator in Hong Kong or overseas/domestic financial institutions joining the CMU under the discretionary approval of the HKMA.

Like other CSD/SSS, CMU could be exposed to common major types of risk including operational risk, system risk, credit risk (arising from linkages with other regional/international CSDs) and legal risk. Unlike a central counterparty (CCP), the CMU does not guarantee settlement and hence is not exposed to any liquidity or credit risk of its participants.

The CMU has put in place a sound risk assessment and management framework, which enables CMU to identify, measure, monitor, manage and control the risks of operating the CMU comprehensively and prudently. The system features and risk management arrangements, as well as the turnover statistics are publicly disclosed. A robust operational risk management framework, supported by appropriate system designs and features, IT policies, procedures and controls, is in place. On-site resilience, a hot back up site, together with a comprehensive disaster recovery plan which is regularly reviewed and rehearsed, help ensure the critical operations of the CMU can be resumed in a timely manner under various contingency situations. This is further supplemented by internal and external audit exercises which are conducted periodically to ensure that effective risk control measures are in place.

II. Summary of major changes since the last update of the disclosure

Major changes since the last update of the disclosure made in October 2018 include:

• Updating all CMU related statistics, charts 1 and 2, to include figures up to September 2018;

III. General background on the CMU

General description of the CMU and the market it serves

The CMU is the debt securities clearing and settlement system in Hong Kong owned and operated by the HKMA. The CMU provides an efficient clearing, settlement and custodian service for debt securities denominated in Hong Kong dollars and other major currencies.

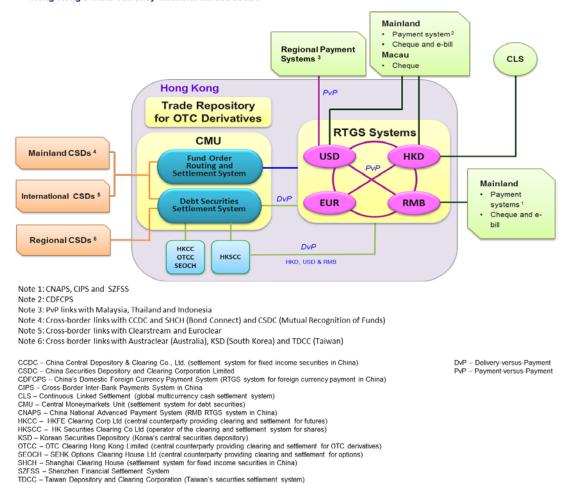
Over the years, the CMU has developed external links with regional and international debt securities settlement systems to assume a more global reach. These links allow overseas investors to hold and settle debt securities lodged with the CMU, and local investors to hold and settle debt securities lodged with overseas systems. The CMU has developed links with debt securities settlement systems in Australia, South Korea, Mainland China, Taiwan and international debt securities settlement systems such as Euroclear and Clearstream.

In addition, with the launch of Northbound Trading of the Bond Connect scheme approved by the Mainland authority, overseas investors from Hong Kong and other countries and areas are able to invest in the China Interbank Bond Market (CIBM). The HKMA has opened accounts with China Central Depository & Clearing Co., Ltd (CCDC) and Shanghai Clearing House (SHCH). By virtue of its accounts with the two Mainland CSDs, CMU can settle Bond Connect transactions and hold CIBM debt securities on behalf of CMU Members, which in turn are providing services directly or indirectly to overseas investors using Bond Connect.

The diagram below is an overview of the financial infrastructure in Hong Kong. Major components include:

- Payment systems for the settlement of interbank payments : Hong Kong dollar, US dollar, euro and renminbi RTGS systems
- Debt securities settlement system for settlement and custody of debt securities: CMU
- Systems links, particularly external links to facilitate cross-border transactions

Hong Kong's multi-currency financial infrastructure



The CMU provides a safe and efficient clearing system and central depository service for CMU eligible instruments which are either immobilised or dematerialised. Transfer of title is effected electronically through computer book entry across the book of the HKMA. Available communication channels include CMU Member Terminals (CMT)¹, SWIFT (support ISO15022 and 20022), File Transfer Service (FTS) and FileAct via the SWIFT network.

The CMU accepts the following types of securities for clearing, settlement and custody:

- Exchange Fund Bills and Notes (EFBN) issued by the Exchange Fund of the HKSAR Government
- Government bonds issued by the HKSAR Government
- Debt Instruments issued by public and private sector entities
- Debt securities lodged with Austraclear in Australia, Korea Securities
 Depository in South Korea, China Central Depository and Clearing Co.,
 Ltd and Shanghai Clearing House in Mainland China.

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¹ CMT refers to a front-end browser software which enables CMU participants to connect to the CMU system either through SWIFTNet or through internet.

• International securities lodged with Euroclear and Clearstream

The CMU has a seamless interface with the Hong Kong dollar, US dollar, euro and renminbi RTGS systems (i.e. HKD CHATS, USD CHATS, Euro CHATS and RMB CHATS) in Hong Kong to facilitate delivery-vs-payment (DvP) settlement for debt securities lodged with the CMU as well as collateral management services. Securities are settled in real-time (BIS Model 1) mode.

In addition to providing clearing and settlement for debt securities, the CMU also offers the following services to its members:

- Market making arrangements for EFBN
- Automatic repo facility (intraday and/or overnight)
- Collateral management service including bank-to-bank repo facility, securities lending programme and triparty repo services partnered with other repo platform providers
- Tendering, allotment and issuance programme for EFBN, and Government Bonds
- CMU Bid (tendering and allotment) for private or public sector debt securities
- Interest and redemption payments
- Corporate action service
- Investment fund order routing and settlement service
- CMU MPF money settlement service (the transfer of payment instructions to relevant CHATS systems for money settlement arising from employee's choice arrangement, which involves money transfer between trustees)

At the end of September 2018, there were 204 CMU participants. Outstanding EFBN and Government Bonds amounted to HK\$1,155.9 billion and outstanding private sector debt securities amounted to HK\$804.1 billion equivalent (refer to Chart 1 below).

The CMU has been operating safely and smoothly since its launch in 1996. The trends of its turnover value and volume from 2005 are shown in Chart 2 below.

Chart 1 Outstanding amount of the CMU issues

Chart 1 shows (a) the outstanding amount of debt securities lodged with the CMU since 2005, broken down by major types; and (b) CMU's percentage market share in HKD debt securities lodged with the CMU.

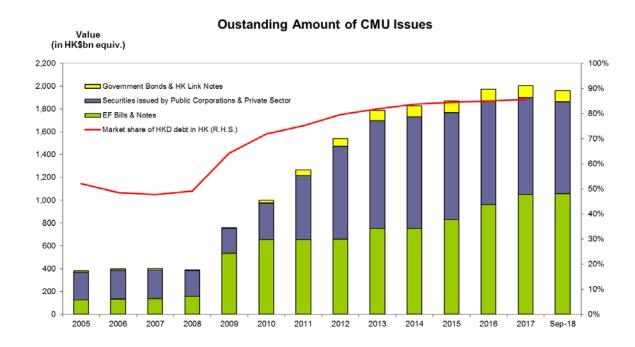
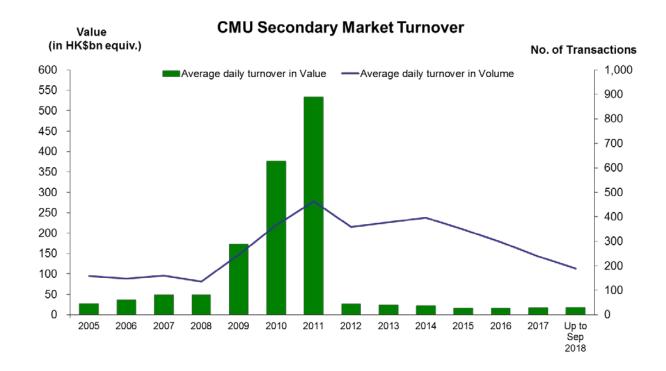


Chart 2 CMU secondary market turnover

Chart 2 shows the average daily turnover (in value and volume) in the secondary market of debt securities lodged with the CMU.



More historical data on the above statistics are available in the monthly statistical bulletin available on the HKMA website:

http://www.hkma.gov.hk/eng/market-data-and-statistics/monthly-statistical-bulletin/table.shtml#section4

General organization of the CMU

The CMU has governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, as well as other relevant public interest considerations and the objectives of relevant stakeholders. The operator of the CMU is the HKMA through the PSOD, which is part of the Financial Infrastructure Department (FID). The HKMA has appointed Hong Kong Interbank Clearing Limited (HKICL) to develop and oversee the day-to-day operation of the computer system of the CMU. The HKMA and the HKICL have established policies and procedures for the safe and efficient operation of the CMU, which is subject to the oversight of the HKMA (via the FMIO team). There are effective "Chinese wall" arrangements within the HKMA to avoid any potential conflicts of interest.

Since the PSOD is a division of the HKMA, the management and operation of this division fall under the governance structure of the HKMA, and are therefore subject to the normal governance, decision-making, audit and control processes of the HKMA. The PSOD is tasked with the day-to-day operations of the CMU, liaison with participants as appropriate and initiating on-going development and enhancements. The CMU participants are consulted and briefed with sufficient advance notice on important initiatives and events affecting the CMU, which may be driven by the HKMA, the local banking industry, or latest developments in international practice and regulation. Further details of the governance structure of the HKMA are available at the HKMA website.

Legal and regulatory framework

The CMU was established in 1990 to provide clearing, settlement and custodian services for debt securities in Hong Kong, and the HKMA serves as the system operator of the CMU. Business activities of the CMU are conducted in Hong Kong and thus subject to the laws of Hong Kong.

The CMU was deemed designated under the then CSSO on 4 November 2004 and granted a certificate of finality on the same day. The CSSO, retitled as the Payment Systems and Stored Value Facilities Ordinance² (PSSVFO) starting 13 November 2015, empowers the HKMA to designate and oversee clearing and settlement systems that are material to the monetary or financial stability of Hong Kong or to the functioning of Hong Kong as an international financial centre. The PSSVFO also provides statutory backing for the settlement finality of transactions effected through such designated systems by protecting the settlement finality from insolvency laws or

² The CSSO is retitled as the PSSVFO to introduce a new regulatory regime for stored value facilities and retail payment systems

any other laws. This ensures that transactions settled through the designated systems are final and irrevocable and will not be reversed in any circumstances, including the insolvency of the system participant, whereas any rights resulting from the underlying transaction of any such transaction will be preserved.

Financial institutions are required to enter into the CMU Membership Agreement in order to join the CMU and utilise CMU services. For certain specific CMU services, CMU participants are further required to sign relevant terms and conditions with the HKMA.

System design and operations

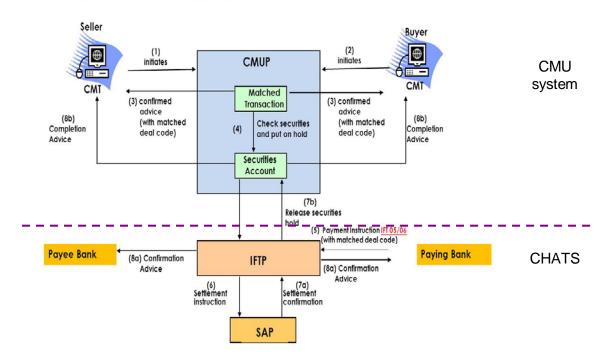
The CMU opens from 8:30 a.m. to 5:15 a.m. (Hong Kong time) of the next calendar day every Monday to Friday, including general holidays in Hong Kong except 1st January of each year. During Hong Kong general holidays on which the CMU is open, USD/Euro/RMB intraday and overnight repo services are provided. Securities transfers and fund transfers are processed in the CMU and the respective domestic RTGS systems.

The CMU does not maintain cash accounts for CMU participants. As the CMU system has a seamless interface with the HKD, USD, Euro and RMB CHATS, fund transfers relating to securities transactions can be effected through the banks' settlement accounts of the respective currency maintained with Settlement Institutions (SIs) or Clearing Bank (CB).

The CMU provides real-time settlement in both single leg securities transfer and DvP transactions. The real-time DvP arrangement for CMU transactions is an example of the Model 1 approach identified by the BIS i.e. the transfer of both securities and fund is conducted on a trade by trade (gross) basis. The final (unconditional) transfer of CMU securities from the seller to the buyer (delivery) follows immediately the transfer of funds from the buyer to the seller (payment). A number of CMU optimiser runs are scheduled during a business day to improve liquidity and settlement efficiency for real-time CMU transactions.

The following diagram shows the settlement mechanism of a typical DvP settlement:

CMU DvP Settlement



For securities transactions to be settled in CMU, participants of CMU must input transaction details into the CMU system on or before the settlement day. Transfer instructions sent to the CMU will be matched on real-time basis.

After CMU participants confirm the trade details and input the transactions into the CMU system, the transactions will be matched within the CMU before settlement. Matching is required for all transactions except house transfers which involve securities transfers among members' main account and custody accounts (sub-accounts). If no match is found, the record will be added to the list of unmatched instructions. The above process will be performed sequentially for each new unmatched instruction. All unmatched instructions will be cancelled by the system after the value day cut-off on the settlement day.

Securities transfers are processed in the CMU as follows:

Through the seamless interface between the CMU and the HKD, USD, Euro and RMB CHATS, securities transactions can be settled on a real-time basis. For real-time DvP transactions, both the seller and the buyer input instructions through their CMT or SWIFT. Once the instruction is matched, it is stored in the system. The system will then look for the specific securities in the seller's account and put the securities on hold, after which an interbank payment message will be generated. After the payment initiated by the buyer is settled across the books of the SIs/CB, a confirmation message will be returned to the CMUP and the securities held will be released to the buyer. If the seller does not have sufficient securities, the system will

retry at 15-minute intervals until the cut-off time. Likewise, if the buyer does not have sufficient funds in its cash accounts, the transactions are held pending settlement until sufficient funds are available. When there are sufficient funds and securities in the accounts of the buyer and seller, settlement takes place immediately and simultaneously. Besides, a number of CMU optimiser runs are scheduled during a business day to improve liquidity and settlement efficiency for all real-time CMU transactions. The schedule is subject to change by the MA in accordance with existing procedures and the daily situation.

During each CMU optimiser run, securities and cash of the selected transactions are settled simultaneously on a multilateral offsetting basis, therefore raising the proportion of securities transfer with real-time settlement. The system calculates the net settlement amount of both securities and cash for each CMU participant, and then checks whether sufficient funds and securities are available for each participant. If so, final transfers of both securities and cash for all members are effected simultaneously. Otherwise, all or some of the transfer instructions of members with insufficient funds or securities are eliminated from the run. In any case, no partial settlement of a securities transaction can be made.

All same-day value unmatched instructions and unsettled transactions will be carried forward to the next value date by the system for further settlement. Unsettled transactions can be re-processed by the system for a maximum of 10 calendar days.

Securities transfers are made by debits and credits to members' securities accounts in CMU in real-time.

Real-time transactions : 8:30 a.m. - 6:30 p.m.

For bank participants, fund transfers in conjunction with CMU are made as debits and credits to members' settlement accounts maintained with SIs/CB. Non-bank participants have to engage banks as their correspondent banks for money settlement across the books of SIs/CB.

Securities transfers and cash transfers are both irrevocable and final when settlement takes place across the books of the HKMA. Securities transfers are final when the transactions are posted to members' securities accounts. This can be done in real-time. Fund transfers become final when the settlement is done across the books of SI/CB. Due to the DvP device in CMU, securities and fund transfers become final when posting of securities and cash are effected in real-time.

The CMU's corporate action service provides a communication platform which facilities the processing of the following operations in an automatic manner:

(a) A paying agent of CMU Instruments announces information about corporate actions to CMU participants which hold the relevant CMU Instruments;

- (b) A CMU participant which holds the eligible CMU Instruments under a corporate action sends authenticated custody instructions to the respective agents; and
- (c) The CMU distributes the proceeds of custody operations accepted in the CMU system to CMU participants on behalf of the respective paying agents. The custody distributions accepted in the CMU system include securities and cash distributions which can be settled through the RTGS systems in Hong Kong.

Besides providing clearing settlement and custody services for debt securities, the CMU provides investment fund order routing and settlement service to facilitate its members to process investment fund transactions. Riding on international investment fund service platforms including those provided by Euroclear and Clearstream, the service is essentially a standardised platform for the processing of investment funds orders routing between local and overseas investment houses, distributors, custodians, and Transfer Agents (TAs) and the settlement of Investment Fund Shares.

Following the launch of Mainland-Hong Kong Mutual Recognition of Funds (MRF) in H2-2015, which allows Mainland and Hong Kong recognised funds to be distributed in each other's market, the CMU has linked up with TAs and fund houses in the Mainland including the China Securities Depository and Clearing Corporation Ltd (ChinaClear) to facilitate cross-border investment fund order routing services.

IV. Principle-by-principle summary narrative 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.
Summary Disclosure	The CMU has a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in its relevant jurisdiction which is Hong Kong:
	1.1 access by users to CMU service is supported by proper legal documentation and transparent rules and procedures. All CMU participants are required to observe the rules promulgated in the CMU Membership Agreement and the CMU reference manual. The CMU Membership Agreement is governed by the laws of Hong Kong
	1.2 PSSVFO ensures settlement finality of debt securities transactions made on the CMU system
	1.3 the laws of Hong Kong recognise dematerialisation and book entry transfer as well as netting arrangements, all of which are key features of the CMU system
	1.4 the appointment of the HKICL as the computer operator to perform the day-to-day computer operation is supported by proper legal documentation, including a Services Agreement and various addendums to the Services Agreement, between the HKMA and HKICL and governed by laws in Hong Kong
	1.5 the CMU conducts its business activities in Hong Kong and is therefore subject to the laws of Hong Kong. For CMU services provided in collaboration with other service providers in overseas jurisdictions which require the CMU to enter into agreements with overseas entities, legal advice is sought in the process of preparing the necessary documents to determine the appropriate choice of law and to prevent potential conflict-of-laws issues. In general, business activities taking place domestically will be subject to the laws of Hong Kong, while activities happening overseas will be subject to the laws of other jurisdictions

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.	
Summary Disclosure	The CMU has 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: 2.1 the CMU operates as a unit of the HKMA, with clear and direct lines of responsibility and accountability	
	2.2 the CMU is subject to the oversight of another department (i.e. the FMIO team under the Banking Conduct Department) in the HKMA (pursuant to the provisions of the PSSVFO) as well as to the internal audit and risk management processes of the HKMA (see the Annex for the organisation chart of the HKMA showing PSOD and FMIO team)	
	2.3 the HKMA has a clear, publicly-communicated governance structure. The relevant information on the organization and governance structure of the HKMA are available in the HKMA's Annual Report or website	
	2.4 the HKMA has clear, publicly-communicated policy objectives of promoting the stability and integrity of the financial system, and maintaining and developing Hong Kong as an international financial centre	

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
Summary Disclosure	The CMU has a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational and other risks:
	3.1 operating as a unit of the HKMA, the CMU is subject to the risk management framework of the HKMA. The framework requires regular assessments of all facets of risk relating to the department, and implementation of effective measures to pre-empt and address the applicable risks
	3.2 risk consideration and analysis are also performed when devising new initiatives and/or FMI linkages. The effectiveness of the risk control measures are also assessed regularly and when needed. CMU's operations are subject to regular internal/external audits
	3.3 a comprehensive set of contingency measures/facilities is in place to deal with different contingency scenarios. Contingency drills are conducted annually or when necessary to mitigate business continuity risk. The BCP is reviewed and updated on a regular basis
	3.4 HKICL as the computer operator of the CMU system may be subject to risks such as operational risk and information technology related risk. The HKICL Board and the Board Sub-Committee oversee the implementation of a sound and comprehensive risk management framework in HKICL with focus on information technology, operational resilience and business continuity. There are also stringent requirements on information technology and operational risk management, including regular performance of external audits, contingency drills and rehearsals of disaster recovery arrangements to ensure business continuity in disaster scenarios
	3.5 HKICL has also obtained certification under two ISO systems and established associated risk management framework: ISO27001 for Information Security Management and ISO9001 for Quality Management System. Under these frameworks, HKICL adopted organised methodologies to identify, measure, monitor and manage effectively all facets of risks that arise in or are borne by HKICL

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.
Summary Disclosure	The CMU has an effective credit risk management process to identify, monitor and control potential credit risk exposures:
	 4.1 CMU only provides debt securities clearing, settlement and custodian services to its participants. CMU is not a counterparty to any securities transactions nor does the CMU offer credit to its participants or guarantee any settlement, hence the CMU will not incur credit exposure to its participants 4.2 CMU has designed various tools to control identified sources of credit risk that a participant may expose, such as DvP settlement mechanism, provision of intraday and/or overnight repo facilities to facilitate participants' liquidity management, no offering of overdraft facility to participants, and direct debit limit to limit the exposure of a non-bank participant to its correspondent bank 4.3 CMU may be subject to credit risk of overseas CSDs/ICSDs as a result of the accounts CMU opens with them for the purpose of holding funds/securities on behalf of CMU participants. Measures to manage such risks are described under our response to Principle
	20 (FMI links)

Principle 5: 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 Collateral should also set and enforce appropriately conservative haircuts and concentration limits. 5.1 CMU only provides debt securities clearing, settlement and custodian **Summary** Disclosure services to its participants. CMU is not a counterparty to any securities transactions nor does the CMU offer credit to its participants or guarantee any settlement, hence the CMU will not incur credit exposure to its CMU therefore does not require any collateral from participants. participants 5.2 the CMU provides the platform for conducting repo transactions (intraday or overnight) to provide short term liquidity to participants of Hong Kong's RTGS systems 5.3 the SIs/CB of the RTGS systems in Hong Kong are responsible for determining the eligibility of individual securities as collaterals and the applicable haircut level. The applicable acceptance criteria are input into the CMU system by the SIs/CB, and the system automatically performs its tasks using specified pricing sources and methodology accordingly 5.4 key collateral management features of the CMU system: • Automatic and manual collateral selection; • Daily mark-to-market of collaterals to ensure bank to bank repo transactions are sufficiently collateralized; • Market prices are updated at least once a day; • Haircut percentages can be defined for different maturity bands of collaterals; • Cross-currency haircut will be applied if the nominal currency of any collateral is different from the settlement currency of the repo transaction; • Mark-to-market threshold range is the tolerance level acceptable to both the buyer and seller. As long as the values of the collaterals in respect of a bank-to-bank repo transaction falls within this threshold range, no top-up or return of securities is required; • Substitution, top-up and return of collaterals 5.5 through CMU's real-time interface with ICSDs, cross-border collaterals can be brought into the CMU system in good time for collateral management purposes as required. Real-time information enables participants to use the collaterals efficiently. Measures are also in place to mitigate potential risks (legal, market, operational, etc.) associated with

the acceptance of cross-border 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.
Summary Disclosure	Not applicable to the CMU as this principle is not applied to CSD and SSS according to the PFMIs.

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.

Summary Disclosure

CMU only provides securities clearing, settlement and depository services as a SSS but not as a CCP. It does not guarantee settlement of securities transactions, hence CMU does not face any liquidity risk:

- 7.1 in the context of CMU, liquidity risk is more related to the risk that a CMU participant may not be able to settle securities transactions due to temporary shortage of funds or insufficient securities to deliver
- 7.2 as a SSS, the CMU system is designed to help address the liquidity risk that a CMU participant may encounter during the settlement process
- 7.3 the CMU has a seamless interface with the RTGS systems in Hong Kong to facilitate fund transfers relating to securities transactions by its participants. All CMU participants are required have a cash settlement account with the SIs/CB directly or indirectly. CMU provides a highly automated collateral management system to support intraday and overnight repo transactions entered between banks and the SIs/CB, through which banks can obtain intraday liquidity using eligible securities
- 7.4 liquidity risk of participants is addressed by various CMU tools such as the intraday/overnight repo mechanism through which CMU participants experiencing temporary shortage of funds can raise short-term liquidity
- 7.5 measures to manage risks arising in the event of a CMU participant default are described under our response to Principle 13 (Default Management)

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.
Summary Disclosure	The CMU provides clear and certain final settlement in both intraday and real-time modes: 8.1 the CMU offers clear and certain final settlement in real-time settlement on a gross basis (PIS Model 1)
	settlement on a gross basis (BIS Model 1) 8.2 the PSSVFO provides statutory settlement finality protection for securities transfer instructions settled in the CMU system
	8.3 the RTGS systems in Hong Kong, with which the CMU system has seamless interface, are also subject to the PSSVFO which safeguards settlement finality of the money leg of the relevant securities transactions
	8.4 the CMU rules and procedures state that once a securities transfer instruction is settled in the CMU system and posted to participant's securities account, it is considered final and irrevocable

Principle 9: Money settlements	An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.
Summary Disclosure	Central bank money is involved for HKD payments, and commercial bank money is involved for USD, RMB and Euro payments.
	9.1 for securities transactions settled over the CMU, the securities legs are settled across the participants' securities settlement accounts with the HKMA. The money settlement legs are effected through settlement accounts of the CMU participants or their correspondent banks maintained with the SIs/CB of the RTGS systems. This can be made available by the seamless interface between the CMU system and the various RTGS systems in Hong Kong
	9.2 for Hong Kong dollar-denominated securities settlement, the transactions will be settled through the settlement accounts maintained with the HKMA in the form of central bank money
	9.3 for US dollar, euro and renminbi-denominated securities settlements, the transactions will be settled through the settlement accounts maintained with the SI of the USD CHATS (HSBC), Euro CHATS (Standard Chartered Bank (Hong Kong) Ltd) and the CB of the RMB CHATS (Bank of China (Hong Kong) Ltd) respectively in the form of commercial bank money
	9.4 SIs for USD and Euro CHATS are commercial banks appointed by the HKMA while the CB for RMB CHATS is appointed by the PBOC. Though commercial bank money is used for money settlement involving USD, euro, renminbi and other foreign currencies, potential credit and liquidity risks are minimal as they are licensed banks in Hong Kong and subject to the stringent supervision of the HKMA. Supervision of licensed banks is performed by the Banking Supervision Department of the HKMA rather than by the CMU. The RTGS systems are also under the oversight of the FMIO team of the HKMA based on the requriements under the PSSVFO and PFMI.
	9.5 Through the seamless interface with the CMU's collateral management system. The SIs/CB of the RTGS systems are able to provide intraday or overnight repo facility to participants to facilitate their liquidity management

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.
Summary	The CMU does not accept physical delivery of debt securities by CMU
Disclosure	participants. Debt securities lodged with the CMU are either dematerialised or immobilised:
	10.1 the depository function to safe-keep global notes is outsourced to CMU's sub-custodian. The CMU follows an established set of procedures to regularly identify potential risks and assess the effectiveness of control measures related to the outsourcing of its depository function
	10.2 securities records of the sub-custodian are reconciled periodically with the records of the CMU to ensure the records are kept properly

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.
Summary Disclosure	CMU has clear rules and procedures to safeguard the rights of securities issuers and holders. Debt securities lodged with the CMU are either dematerialised or immobilised:
	11.1 the rights and responsibilities of securities issuers and holders are carefully considered and stipulated in CMU documents (including the CMU Membership Agreement and the CMU reference manual), which are prepared, reviewed and approved by relevant units of the HKMA
	11.2 besides adopting robust accounting practices, stringent procedures are in place governing creation/cancellation of securities records in the system's database. There are also control measures (including internal/external audits) to ensure securities holdings of CMU participants are properly accounted for, and reconciliation reports are provided daily to CMU participants to facilitate their reconciliation with their own records
	11.3 all debt securities cleared through the CMU are either immobilised or dematerialised with transfer of title being effected in computerised book-entry form. Dematerialisation and book-entry transfer are recognised by the laws of Hong Kong
	11.4 the CMU requires its participants to segregate their proprietary holdings from their customers. This is catered for by the account structure within the CMU system which allows each participant to have one general custody account as well as one or more specific custody account(s)
	11.5 to ensure that securities records are complete and accurate, periodic reconciliation of the total number of global notes lodged with the CMU system against the record of CMU's sub-custodian is performed. This is to ensure that both the physical certificates and book-entry record tally with each other

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.
Summary Disclosure	CMU has implemented arrangements to eliminate principal risk for the settlement of securities transactions:
	 12.1 through the seamless interface between the CMU and the RTGS systems in Hong Kong, debt securities transactions can be settled on a DvP basis in real-time gross settlement basis (BIS Model 1) to eliminate principal risk. This means that settlement of the securities leg of the transaction occurs, and only occurs, simultaneously with the settlement of the money leg of the transaction 12.2 the PSSVFO further provides the legal basis for settlement finality of linked obligations in the CMU

Principle 13: Default Management	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.
Summary Disclosure	The CMU has effective and clearly defined rules and procedures to manage participant default:
	13.1 the CMU does not guarantee settlement of debt securities transactions, and thus will not incur any loss or liquidity risk due to any CMU participant default
	13.2 CMU rules and procedures for managing a participant default have been set out in the CMU Membership Agreement and other relevant CMU documentations
	13.3 In general, in the event of a participant default, the CMU will continue to provide services to its participants as usual and the daily settlement process will not be affected. However, the defaulting participant will be prevented from accessing the CMU system and its accounts will be frozen until the HKMA authorizes otherwise. All settled trades involving the defaulting participant are final and irrevocable, and all unsettled transactions involving the defaulting participant will be cancelled
	13.4 Since the assets of a participant's customer are segregated from those of the participant, and do not form part of the assets of the participant, in case of an insolvency of a CMU participant the customer may instruct that his/her assets be moved to a solvent participant. Proprietary assets of the defaulted participant will be suspended until further notice
	13.5 Certain CMU services may have separate rules and procedures to deal with participant default, and such default rules are set out in the relevant terms and conditions of the CMU service concerned

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.
Summary Disclosure	Not applicable to the CMU as this principle is not applied to CSD and SSS according to the PFMIs.

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 providing 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.
Summary Disclosure	Not applicable to the HKMA as the operator and owner of the CMU, since the HKMA is Hong Kong's central banking institution.

Principle 16: Custody and investment risks	An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.
Summary Disclosure	The HKMA/CMU has prudent investment and risk management policies and procedures to safeguard its own and its participants' assets:
	16.1 the department in the HKMA responsible for operating the CMU (i.e. FID) does not own any assets
	16.2 the assets of the HKMA (Exchange Fund) are invested in accordance with the investment and risk management policy of the Exchange Fund, a description of which can be found in the website and annual report of the HKMA
	16.3 except in the case of holding securities for participants in accounts that the CMU maintains with ICSDs/CSDs, the CMU does not receive or hold participants' assets. Documentation, rules and procedures for participating in ICSDs/CSDs are carefully prepared by in-house legal counsels of the HKMA to ensure that the rights and obligations of the CMU are fully protected
	16.4 the CMU provides a depository service to safekeep the physical global certificates lodged by debt securities issuers or lodging agents, and outsources such depository service to a selected sub-custodian which is subject to prudent assessment and selected on merit. Reviews are conducted periodically to ensure that relevant control and security features are in place and up to standard, and to reconcile the sub-custodian's records with those of the CMU. The appointed sub-custodian is located in Hong Kong and thus under the supervision of the appropriate local supervisory authority. Prompt access to assets under custody is also safeguarded by provisions in the service agreement with the appointed sub-custodian which is subject to the laws of Hong Kong

Principle 17: Operational risks

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.

Summary Disclosure

Plausible sources of operational risk have been identified by the CMU and appropriate systems, policies, procedures and controls have been designed and implemented to address such risks:

- 17.1 operating as a unit of the HKMA, the CMU is subject to the risk assessment and management framework of the HKMA. The framework requires regular assessments of all facets of risk relating to the department, and implementation of effective measures to pre-empt and address the applicable risks
- 17.2 timely recovery of the CMU functions at the HKMA has been fully recognised in the corporate BCP of the HKMA. The CMU functions are considered critical functions and are assigned priority for immediate recovery in case of wide-scale or major disruption
- 17.3 timely recovery of the computer operation of the CMU is ensured by the risk management and business continuity management processes of HKICL

In respect of the operation of the computer system of the CMU:

- 17.4 the HKMA has appointed HKICL to oversee the day-to-day operation of the computer system of the CMU
- 17.5 the HKICL Board assigns operational reliability performance targets and imposes stringent operational risk management requirements. It pays particular attention to ensuring operational resilience and business continuity arrangements. Also, HKICL has established plans to ensure cyber resilience.
- 17.6 the operational policies, procedures and controls of HKICL are designed to meet the objectives of maintaining a high level of system availability (over 99.5%) of the CMU system. They are regularly reviewed and tested thoroughly before and after significant changes are launched. The systems are designed to be scalable to accommodate stress volumes under prevailing performance levels and

- are tested before going live. The computer systems and controls, and operational policies and procedures are subject to regular computer audits, operational audits and certification audits (ISO standards) carried out by external auditors/certification authorities
- 17.7 the HKICL has established plan to observe the Guidance on Cyber Resilience for Financial Market Infrastructures issued by CPMI-IOSCO and the Cybersecurity Fortification Initiative issued by HKMA in addressing cyber threats
- 17.8 the HKICL employs comprehensive business contingency plan (BCP) arrangements to cater for events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption
- 17.9 the BCP includes arrangements for HKICL to respond to unplanned service disruption to the CMU and aims at facilitating timely resumption of the service of the CMU in the event of a disruption
- 17.10 the BCP is reviewed regularly and updated when necessary. Procedures are in place to ensure that it reflects the latest system changes.

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.
Summary Disclosure	The CMU has objective, risk-based and publicly disclosed criteria for participation, which permit fair and open access:
	18.1 usage of CMU services is voluntary and participation is not compulsory. CMU participants can be either Recognized Dealers (RD) of EFBN and Government Bonds or CMU Members, or both. RDs are entitled to hold EFBN and Government Bonds while CMU Members are entitled to hold CMU Instruments
	18.2 Authorized Institutions in Hong Kong under the Banking Ordinance (BO) may apply to become RD of EFBN. Application from other financial institutions (overseas or otherwise) may also be considered at the discretion of the HKMA
	18.3 A financial institution regulated by any one of the following authorities may apply to become a CMU Member: (i) HKMA; (ii) Securities and Futures Commission; (iii) Office of the Commissioner of Insurance; or (iv) Mandatory Provident Fund Schemes Authority. CMU membership may be granted to such a financial institution, or to any institution (overseas or otherwise) not regulated by an authority referred to above, subject to the discretion of the HKMA
	18.4 the entry criteria are objective and risk-based (the majority are AIs and LCs subject to the supervision of the HKMA and the SFC respectively). Such criteria have been publicly communicated on the HKMA website/CMU Bond Price Bulletin website
	18.5 suspension and exit arrangements are covered in the CMU Membership Agreement and Reference Manuals, which constitute a contract between the CMU and its participants. CMU participants may exit the CMU system voluntarily or involuntarily. In the latter case, CMU may suspend a CMU participant from participating in the system based on legitimate reasons (e.g. revocation of banking licence) in accordance with the CMU rules and procedures
	as set out in the CMU Membership Agreement, the CMU Member's membership may be terminated with immediate effect upon the making of a bankruptcy or winding up order, or the passing of a

resolution for voluntary winding up, in relation to the CMU Member

Principle 19: Tiered participation arrangements	An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.
Summary Disclosure	Not applicable to the CMU. The CMU adopts a single-tier membership structure and has no tiered participation arrangements.

Principle 20: FMI links	An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.
Summary Disclosure	The CMU has identified, monitored and managed the risks arising out of its link with other FMIs:
	20.1 the CMU has set up cross-border one-way links with CSDs in Australia (AustraClear), Mainland China (Shanghai Clearing House) and Taiwan (TDCC), as well as two-way links with South Korea (KSD), Mainland China (CCDC) and ICSDs such as Clearstream and Euroclear
	20.2 the CMU has also established a two-way link with HKSCC and three one-way links with HKCC, SEOCH and OTC Clear in Hong Kong. In addition, the CMU has seamless interface with the HKD, USD, Euro and RMB CHATS in Hong Kong in order to provide DvP service
	20.3 processes are in place to identify and manage potential sources of link-related risk (e.g. legal, credit, system, operational risks). Before establishing FMI links, the HKMA evaluates the risk and adequacy of the legal framework governing the links. Legal documentation is reviewed by in-house legal counsel. Risk assessments are also conducted to ensure that the linkage service providers are of high credit quality, and the CMU regularly reviews the credit ratings of the linked FMIs

Principle 21: Efficiency and effectiveness	An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.
Summary Disclosure	The CMU is effective and efficient in meeting the requirements of its participants and the markets it serves:
	21.1 apart from operating the CMU, the FID is also responsible for formulating long-term strategy to promote the development, operational excellence, safety and efficiency of the financial infrastructure in Hong Kong
	21.2 the effectiveness, efficiency and safety of the CMU is further ensured by the oversight of the FMIO team of the HKMA
	21.3 the CMU system has established quantifiable objectives on up time and system availability performance, which are measured against and monitored constantly. Since inception, the CMU has met the objectives of providing a reliable and efficient debt securities clearing and settlement system and maintaining Hong Kong as an international financial centre
	21.4 the CMU also collaborates with relevant stakeholders (including CMU participants, HKICL) in the design and implementation stages when devising measures to enhance the system's operating efficiency, effectiveness and safety

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.
Summary Disclosure	The CMU has adopted internationally-accepted communication procedures and standards to facilitate efficient clearing, settlement and recording of debt securities transfers: 22.1 the CMU system adopts SWIFT (SWIFTNet) messaging services, including FIN, InterAct, Browse and FileAct, to process debt securities transfer instructions. Message type standards ISO15022 and 20022 are both supported by CMU. The use of SWIFT standards facilitates overseas users to access CMU via SWIFTNet in the same manner as local users without the need of any proprietary technology or special arrangements. Hence, the operating procedures, processes, and systems used by the overseas users and local users are the same 22.2 the CMU has also installed proprietary front-end systems provided by other ICSDs/CSDs to facilitate communication with the ICSDs/CSDs which are linked with the CMU

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.
Summary Disclosure	The CMU has clear and comprehensive rules and procedures, and has provided 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. Key features and procedures of the CMU, as well as system turnover statistics, have been publicly disclosed: 23.1 the role and objectives of the HKMA as the operator of the CMU have been publicly disclosed in various publications and the website of the HKMA 23.2 the key features of the CMU system, including settlement modes and settlement finality have been publicly disclosed in various publications and the website of the HKMA. Fee schedules, as well as the CMU reference manual, which cover relevant rules and key
	procedures of CMU, have been publicly disclosed on the website of HKMA 23.3 the detailed operating rules and procedures, the rights and obligations of the HKMA as the operator of the CMU and the CMU participants, as well as the fee schedule of the CMU are covered in various documents (e.g. CMU Membership Agreement, terms and conditions for specific CMU services, the CMU reference manual, etc.) and other communications issued by the CMU to CMU participants 23.4 transaction data including turnover statistics and outstanding amounts of debt securities are published on the website of the HKMA

Principle 24:	A TR should provide timely and accurate data to relevant authorities and the
Disclosure of	public in line with their respective needs.
market data by	
trade	
repositories	
Summary	Not applicable to the CMU as this principle is not applied to CSD and SSS
Disclosure	according to the PFMIs.

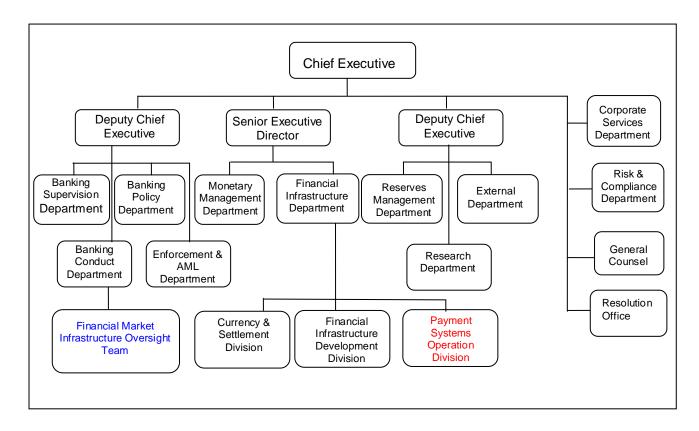
V. List of publicly available resources

List of public resources relevant to CMU		Website
1.	EFO	http://www.elegislation.gov.hk/hk/cap66!en@1997-07-01T00: 00:00
2.	PSSVFO	https://www.elegislation.gov.hk/hk/cap584!en@2017-02-13T0 0:00:00
3.	Policy Statement - Oversight of Financial Market Infrastructures by the Hong Kong Monetary Authority	http://www.hkma.gov.hk/media/eng/doc/key-functions/banking -stability/oversight/FMI_oversight.pdf
4.	Oversight Framework for Designated Clearing and Settlement Systems - A Guideline issued by the Monetary Authority under the PSSVFO	http://www.gld.gov.hk/egazette/pdf/20162020/egn201620202777.pdf
5.	Application of Principles for Financial Market Infrastructures to Designated Clearing and Settlement Systems – A Guideline issued by the Monetary Authority under the PSSVFO	http://www.gld.gov.hk/egazette/pdf/20162020/egn201620202778.pdf
6.	Explanatory Note on Designation and Issuance of Certificate of Finality of Clearing and Settlement Systems under the PSSVFO	http://www.hkma.gov.hk/media/eng/doc/key-functions/banking -stability/oversight/explanatory_note.pdf
7.	HKMA Annual Report	http://www.hkma.gov.hk/eng/publications-and-research/annual-report/2016.shtml
8.	HKICL	www.hkicl.com.hk
9.	CMU – Main scope of services and other key features	http://www.hkma.gov.hk/eng/key-functions/international-finan cial-centre/infrastructure/cmu.shtml
10.	HKMA Quarterly Bulletin	http://www.hkma.gov.hk/eng/publications-and-research/quarter ly-bulletin/
11.	HKMA Statistical Bulletin	http://www.hkma.gov.hk/eng/market-data-and-statistics/monthl

		y-statistical-bulletin/
12.	List of Recognized Dealers	http://www.hkma.gov.hk/media/eng/doc/key-functions/finanical-infrastructure/infrastructure/cmup8027.pdf
13.	List of CMU Members	http://www.hkma.gov.hk/media/eng/doc/key-functions/finanical-infrastructure/infrastructure/cmup8030.pdf
14.	CMU Tariff	http://www.hkma.gov.hk/media/eng/doc/key-functions/finanical-infrastructure/infrastructure/CMU_Tariff.pdf
15.	CMU reference manual	http://www.hkma.gov.hk/media/eng/doc/key-functions/finanical-infrastructure/infrastructure/CMU_Ref_Man.zip

Annex. Organisation Chart of the HKMA

(http://www.hkma.gov.hk/media/eng/doc/about-the-hkma/the-hkma/organisation-chart/org_chart.pdf)



Notes:

The relevant division operating the CMU is marked in red. The relevant team overseeing the CMU is marked in blue.