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July 2014

OVERSIGHT AND SUPERVISION OF FINANCIAL MARKET INFRASTRUCTURES–TECHNICAL NOTE

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OVERSIGHT AND SUPERVISION OF FINANCIAL MARKET INFRASTRUCTURES

Prepared By
Monetary and Capital Markets Department

This Technical Note was prepared by IMF staff in the context of the Financial Sector Assessment Program (FSAP) in People's Republic of China––Hong Kong Special Administrative Region (HKSAR). It contains technical analysis and detailed information underpinning the FSAP's findings and recommendations.

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Glossary

ATRS	Approved Trade Registration Systems
BOCHK	Bank of China (Hong Kong) Ltd.
CCP	Central Counterparty
CCASS	Central Clearing and Settlement System (for equities)
CHATS	Clearing House Automated Transfer System
CLS	Continuous Linked Settlement
CMU	Central Moneymarkets Unit
CPSS	Committee on Payment and Settlement Systems
CSD	Central Securities Depository
CSSO	Clearing and Settlement Systems Ordinance
DCASS	Derivatives Clearing and Settlement System
DNS	Deferred Net Settlement System
DTC	Depository Trust Company
DvP	Delivery versus Payment
EFBNs	Exchange Fund Bills and Notes
ESMA	European Securities and Markets Authority
EU	European Union
EUR	Euro
FID	Financial Infrastructure Department
FMI	Financial Market Infrastructure
FSB	Financial Stability Board
FS	Financial Secretary
FSTB	Financial Services and the Treasury Bureau
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
HKSAR	Hong Kong Special Administrative Region
HKSCC	Hong Kong Securities Clearing Company Limited
IOSCO	International Organization of Securities Commissions
MoU	Memorandum of Understanding
OTC	Over-the-Counter
PBoC	People's Bank of China
PFMIs	Principles for Financial Market Infrastructures
PRC	Process Review Committee
PSO	Payment Systems Oversight
PvP	Payment versus payment
RMB	Renminbi

RTGS	Real Time Gross Settlement
SCBHK	Standard Chartered Bank (Hong Kong) Ltd.
SEC	Securities and Exchange Commission in the United States
SEHK	The Stock Exchange of Hong Kong Limited
SEOCH	The SEHK Options Clearing House Limited
SFC	Securities and Futures Commission
SFO	Securities and Futures Ordinance
SOM	Supervision of Markets
SSS	Securities Settlement System
TR	Trade Repository
USD	United States dollar

SUMMARY

Nine financial market infrastructures (FMIs) operate in HKSAR; the effectiveness of their supervision and oversight is critical in maintaining financial stability. To support their objective of consolidating Hong Kong's position as an international financial center, the Hong Kong authorities have fostered the development of sophisticated and multi-currency FMIs. The FMIs comprise four large-value interbank payment systems (real time gross settlement, RTGS) for payments in Hong Kong dollar, U.S. dollar, euro, and renminbi, respectively; two distinct securities settlement systems (SSSs), one for government-issued and private sector debt securities, and the other, which is also a central counterparty (CCP), for securities traded on the Stock Exchange of Hong Kong Ltd (SEHK); and two CCPs for listed derivatives. In addition, a new CCP was launched to clear over-the-counter (OTC) derivatives in November 2013. Though none is large in global terms, the financial weight of the main ones is comparable with the FMIs of other large financial sectors (the United Kingdom, the United States, and the Euro zone) in terms of GDP.

The risks associated with domestic and overseas linkages appear to be adequately managed. Extensive domestic and overseas system linkages have been implemented making HKSAR a regional settlement hub. In addition to the links between the four HKSAR RTGS systems for domestic foreign exchange transactions, HKSAR has also established various payment links with other central banks in Asia (currently with Malaysia, Indonesia, and soon with Thailand) and also with the Mainland, the latter both for cross-border foreign currency transactions and renminbi payments. The renminbi settlement business has steadily increased since 2010, with the full support of the People's Bank of China (PBoC). Domestic SSSs are not only linked with the national currency RTGS, as is usual, but also with the foreign currency ones to enable settlement of foreign currency denominated securities, as well as intraday and overnight repos. In addition, to settle transactions for U.S. dollar-denominated debt securities traded in Malaysia, the U.S. dollar RTGS is linked with the Real-Time Electronic Transfer of Funds and Securities System in Malaysia. There are currently no links between CCPs, which might generate larger risks.

The legal framework should be amended to explicitly prohibit a domestic clearing house from operating in HKSAR without being recognized as such. The respective legal framework and policy mandate determines the actions of the Hong Kong Monetary Authority (HKMA) and the Securities and Futures Commission (SFC) as the two regulatory, oversight and supervision authorities for FMIs in HKSAR**.** However, the law does not require a domestic clearing house to be recognized as such by the SFC. Although it is unlikely that a CCP or a SSS would operate in HKSAR without being recognized, it would be clearer and safer to make the law require such recognition. This could be done by taking the opportunity of including this with any other required changes to the Securities and Futures Ordinance (SFO) in the medium term.

The framework for oversight and supervision of the FMIs appears effective, and the SFC is strengthening its supervisory approach. The HKMA and the SFC exercise close and continuous oversight and supervision over FMIs. Their objectives, functions and duties are to ensure financial stability, and in doing so, to maintain HKSAR as a competitive and innovative financial center. Both

aspects are compatible since financial stability is essential to the attractiveness of HKSAR as a financial center. All systemically important FMIs are currently subject to regulation, supervision, and oversight by either the central bank or the market regulator. The law provides both authorities with specific and extensive powers with regard to FMIs consistent with their responsibilities, including the ability to obtain information and require change. In addition, the HKMA and the SFC have clearly defined and publicly disclosed their supervisory and oversight policies with respect to FMIs. The main oversight and supervision tools are approval of changes in the FMIs' rules, daily monitoring of their activity, and frequent contact with the FMIs and their participants. HKMA also conducts periodic assessments against the international standards and some on-site inspections. The SFC is planning to begin onsite reviews of the Hong Kong Exchanges and Clearing Limited (HKEx), including its clearing houses, in 2014. Finally, both authorities have the financial and human resources needed for discharging their responsibilities. However, the additional workload generated by the adoption of the new Principles for FMIs (PFMIs), as well as the development of OTC derivatives infrastructures, suggest the need to increase capacity at the SFC, and to support the ongoing work to strengthen its supervisory approach.

The authorities should set a fixed timetable by which Hong Kong FMIs are required to observe the PFMIs. Since all FMIs have been classified as systemically important, they should all comply with the PFMIs, without any reduction in the related requirement level. The HKMA and the SFC have publicly adopted the PFMIs. The FMIs under the purview of the SFC are in the process of finalizing their self-assessment against the principles and have discussed preliminary findings with the SFC to assess the changes needed. The HKMA has reviewed the self-assessments conducted by the FMIs under its purview and is in discussion with them on the actions required to ensure observance of the principles. In particular, the authorities are considering the different means to satisfy the additional requirements brought by the PFMIs for each FMI. The firm commitment made by the authorities to make all FMIs comply with the PFMIs will help ensure Hong Kong FMIs achieve the internationally agreed level of risk management.

In line with the 2003 FSAP recommendation, the HKMA should continue pursuing the reduction of intraday settlement risk in the Central Moneymarkets Unit (CMU). The HKMA has been very successful in generating key changes in the cash and debt securities settlement landscape over the past decade. In particular, most of the 2003 FSAP recommendations have been promptly taken care of. However, the recommendation regarding CMU end-of-day net settlement, and the related need to withstand the default risk of the largest participant, has not been completely addressed yet. Efforts have been made to increase the proportion of real time delivery versus payment (DvP) settlement to 20 percent by value in 2013. Further enhancements are planned to increase it in such a way as to provide intraday finality for most transactions. In addition, while a preliminary analysis suggests that the RTGS systems are robust to the new requirements implied by the PFMIs, the issue of the non-collateralized credit extension in U.S. dollar and euro clearing house automated transfer systems (CHATS) needs to be further addressed.

Additional steps are needed to enhance risk management and to comply with the new PFMIs at the clearing houses. Enhancing the financial risk management arrangements of the three long established clearing houses—Hong Kong Securities Clearing Company Limited (HKSCC), HKFE Clearing Corporation Limited (HKCC) and the SEHK Options Clearing House Limited (SEOCH)—has taken time. The main improvements were made in 2011 and 2012, but additional ones are needed to address all the previous FSAP recommendations. First, settlement finality should apply to all transactions settled by the HKSCC, including when not acting as a CCP. Then, the authorities should explore the possibility to grant a settlement account to HKSCC in the Hong Kong dollar RTGS to reduce the credit risk of the CCP (this would also apply to the derivatives CCPs, which were not assessed in 2003). Other key changes will also be needed for these three clearing houses to comply with the PFMIs.

For HKSCC, the separation of the functions of CCP and central securities depository (CSD) into two distinct FMIs could be explored, in line with international best practices. HKSCC provides two services—that of a CSD/SSS and a CCP—with two distinct risk profiles. However, resources provided by HKEx to HKSCC for its operations, including capital, are not clearly separated and earmarked between its CSD/SSS and CCP functionalities. In times of crisis, this could adversely impact the discharge of its roles as a CCP and a CSD/SSS. Therefore, it would be useful for the HKSCC to review its organization to facilitate potential execution of its recovery and resolution plan.

Further steps planned to formalize and enhance cooperation between authorities regarding the safety and efficiency of HKSAR's FMIs, both at the domestic and cross-border levels, are welcome. Existing cooperation arrangements appear strong and effective. The HKMA co-operates with the central banks of other jurisdictions in the oversight of foreign currency RTGS and cross-border links and intends to further enhance some of the cooperation arrangements. Although effective, it would be useful if the HKMA systematically formalized them. As for the SFC, it is encouraged to continue its discussions with relevant foreign authorities on CCP reforms to try and minimize the negative implications of conflicts of law, or even level playing field issues for some market participants. At the domestic level, the Memorandum of Understanding (MoU) between the HKMA and the SFC is planned to be complemented with respect to cooperation in the OTC derivatives field, but could also be expanded to include cooperation arrangements in times of crisis.

Finally, the mission supports the ongoing steps that are being taken to reflect the latest Financial Stability Board's (FSB) requirements on effective resolution regimes for FMIs. Although the statutory and regulatory framework in HKSAR was relatively well-developed before the global financial crisis, further strengthening is now needed to reflect the latest best practices for effective resolution regimes. The authorities are encouraged to ensure the necessary legislation is implemented as soon as feasible, and at the very least in line with current expectations of 2015. In the meantime, they should develop a recovery and resolution plan for each FMI, which should either allow the critical services of the FMI to be sustained or for the FMI's winding down to be conducted in an orderly manner.

Table 1. Hong Kong SAR: Main Recommendations and Suggestions on Oversight and Supervision of Financial Market Infrastructures

Recommendations and Entities Responsible for Implementation	Financial Stability Relevance	Timeframe
A timetable by which Hong Kong FMIs are required to observe the PFMIs should be disclosed (HKMA and SFC)	High	<1 year
As planned, the SFC is to continue strengthening its supervisory approach (SFC)	High	1–3 years
To reduce credit risk, the possibility to grant a settlement account to each CCP in the Hong Kong dollar RTGS should be explored (HKSCC, HKMA, SFC)	High	1–3 years
A recovery and resolution plan should be developed for each FMI (HKMA, SFC)	High	1–3 years
Settlement finality should apply to all transactions settled by HKSCC, including when not acting as a CCP (HKSCC, SFC)	High	3–5 years
To reduce liquidity risk, efforts to further develop intraday DvP in CMU should be pursued (HKMA)	Medium	1–3 years
The legal framework should be amended to explicitly prohibit a domestic clearing house from operating in HKSAR without being recognized as such (SFC)	Medium	3–5 years
Additional Suggestions and Entities Responsible for Implementation	Relevance	Timeframe
In addition to the planned enhancements with respect to cooperation in the OTC derivatives field, the MoU between the HKMA and the SFC could also be expanded to cover cooperation in times of crisis (HKMA, SFC)	Medium	1–3 years
As planned, the main cooperation arrangements at the cross-border level could be further formalized, in particular through MoUs or other formal arrangements with foreign central banks or other authorities (HKMA)	Medium	1–3 years
Discussions on CCP reforms with relevant foreign authorities should continue to seek to minimize the negative implications of conflicts of law, or even level playing field issues for some market participants (SFC)	Medium	1–3 years
Additional capacity, in particular human resources, for the supervision of FMIs may be needed at SFC (SFC)	Medium	1–3 years
Separating the functions of CCP and CSD/SSS of HKSCC into two distinct FMIs could be explored (HKSCC, SFC)	Medium	1–3 years

INTRODUCTION

1. **The way HKSAR authorities supervise and oversee post-trade FMIs is an essential issue in promoting and maintaining domestic financial stability.** Because well-functioning FMIs can vastly improve the efficiency, transparency, and safety of financial systems, but can also concentrate systemic risk, their appropriate supervision and oversight[1] is critical to public policy goals. In particular, reflecting the experiences of the recent financial crisis, CCPs are playing a greater role in the financial architecture. Given CCPs concentrate counterparty risk, they are most relevant for financial stability. In this note, FMIs cover payment systems, SSSs[2] and central counterparties.[3]

2. **This note reviews the oversight and supervisory framework for systemically important FMIs in HKSAR.[4]** Its objective is to determine whether and how well HKSAR's authorities fulfill their regulatory, supervisory and oversight responsibilities for FMIs, identify the main areas of concern that impact financial sector stability, and help identify potential opportunities for improvement. In April 2012, the Committee on Payment and Settlement Systems (CPSS) and the International Organization of Securities Commissions (IOSCO) published a new set of PFMIs, replacing the existing standards.[5] These new Principles were adopted by the Executive Board of the IMF as benchmarks for FSAPs, beginning January 2013. This analysis is therefore based on the relevant requirements of the PFMIs, in particular the five responsibilities of central banks, market regulators and other relevant authorities for FMIs (see Box 1), as well as other principles, in particular Principle 9 (Money settlement) and Principle 20 (FMI Links for FMIs other than payment systems). The FSAP for HKSAR is among the first to base the assessment of the oversight and supervision of FMIs on these new standards, which are more stringent and detailed than the previous ones, and which automatically

[1] As defined in the CPSS report on "Central Bank Oversight of Payment and Settlement Systems" Bank for International Settlements, Basel, 2005, "oversight of payment and settlement systems is a central bank function whereby the objectives of safety and efficiency are promoted by monitoring existing and planned systems, assessing them against these objectives and, where necessary, inducing change."

[2] In this note, SSS also include central securities depositories.

[3] The HKMA has launched a local trade repository (TR) for OTC derivatives. Although TRs are now considered part of FMIs, this note does not address this new HKSAR TR since it is not yet fully implemented.

[4] This note was prepared by Christine Sampic, Expert for the IMF's Monetary and Capital Markets Department. Her analysis was based on the authorities' answers to the Fund's questionnaire, the review of relevant laws, regulations, guidelines, other documents, and websites, as well as meetings with the relevant authorities (HKMA, SFC), all the FMI operators and representatives of the financial industry. This note was prepared based on the information available in November 2013. The expert wants to thank staff of the HKMA and the SFC for their full cooperation as well as to extend her appreciation to market participants with whom she met.

[5] The new single set of principles promotes greater consistency in the oversight and regulation of FMIs. It reflects lessons drawn from the recent financial crisis, as well as experience of the operation of such infrastructures since the previous standards were adopted. Compared with the previous standards, the new principles introduce more demanding requirements for participant default arrangements, the management of liquidity risk, operational risk and risks arising from links and interdependencies. In addition, the principles address some issues not fully covered by previous standards, such as segregation and portability, tiered participation and general business risk. The responsibilities of central banks, market regulators and other relevant authorities for FMIs are described in detail.

bring additional recommendations. Building on this analysis, the note addresses a number of issues that are relevant in the current Hong Kong and international context.

Box 1. Responsibilities of Central Banks, Market Regulators, and Other Relevant Authorities for Financial Market Infrastructures

Responsibility A: Regulation, supervision, and oversight of FMIs

FMIs should be subject to appropriate and effective regulation, supervision, and oversight by a central bank, market regulator, or other relevant authority.

Responsibility B: Regulatory, supervisory, and oversight powers and resources

Central banks, market regulators, and other relevant authorities should have the powers and resources to carry out effectively their responsibilities in regulating, supervising, and overseeing FMIs.

Responsibility C: Disclosure of policies with respect to FMIs

Central banks, market regulators, and other relevant authorities should clearly define and disclose their regulatory, supervisory, and oversight policies with respect to FMIs.

Responsibility D: Application of the principles for FMIs

Central banks, market regulators, and other relevant authorities should adopt the CPSS-IOSCO Principles for FMIs and apply them consistently.

Responsibility E: Cooperation with other authorities

Central banks, market regulators, and other relevant authorities should cooperate with each other, both domestically and internationally, as appropriate, in promoting the safety and efficiency of FMIs.

Source: CPSS-IOSCO Principles for FMIs (PFMIs), April 2012.

3. **The assessment's outcome is not a detailed assessment report, but rather a technical note** that includes (i) an overview of the payment, clearing, and settlement landscape; and (ii) a discussion on each of the Responsibilities of the authorities. The appendices provide the related detailed information: main characteristics of each FMI, comparative FMI turnover figures, FMI links description, and overview of FMI oversight and supervision.

OVERVIEW OF FINANCIAL MARKET INFRASTRUCTURES

4. To support their objective of consolidating Hong Kong's position as an international financial center, the authorities have fostered the development of sophisticated and multi-currency FMIs. There are currently nine FMIs located in HKSAR, as shown in Figure 1 and described below:[6]

- Four large-value interbank payment systems, namely Hong Kong dollar CHATS, U.S. dollar CHATS, euro CHATS, and renminbi CHATS, handle settlement on an RTGS basis for interbank payments denominated in Hong Kong dollar, U.S. dollar, euro, and renminbi respectively.

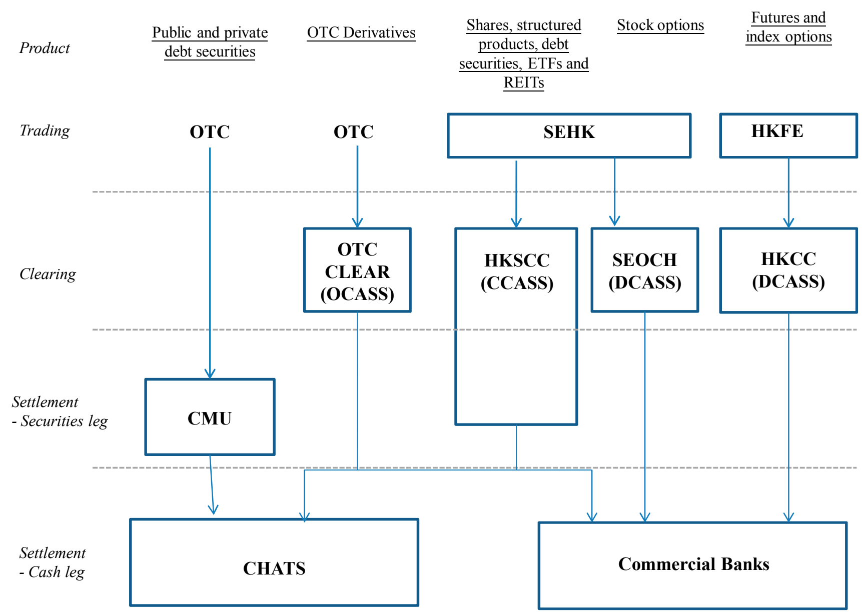
- In addition, securities traded in HKSAR are cleared and settled through two SSSs, namely the CMU operated by the HKMA for the clearing and settlement of OTC transactions in government-issued and private sector debt securities, and the Central Clearing and Settlement System (CCASS) operated by the HKSCC for the clearing and settlement of securities traded on the SEHK. Both the CMU and HKSCC act as central securities depositories and HKSCC is also a CCP for exchange traded transactions on the cash market.

- The HKCC and the SEOCH act as CCPs and use a common clearing and settlement system, the Derivatives Clearing and Settlement System (DCASS), for clearing the derivatives contracts traded on the HKFE and stock options contracts traded on SEHK.

- In addition, a ninth FMI has recently been created as, the HKEx, which is the holding company for HKSCC, HKCC, and SEOCH, has launched a new CCP for OTC derivatives (OTC Clearing Hong Kong Limited—OTC Clear): it was recognized as a clearing house by the SFC in October 2013 and began operations on November 25, 2013. OTC Clear provides an interface with three Approved Trade Registration Systems (ATRS), namely MarkitWire, DSMatch and the new Hong Kong TR developed by the HKMA: clearing members are able to submit their trades for matching and confirmation through any of the three ATRS; once matched, trade data will be transmitted directly to OTC Clear.

[6] Appendix 1 provides each FMI's main characteristics.

Figure 1. Hong Kong SAR: Overview of Current Financial Market Infrastructures



Sources: SFC and Mission Expert.

5. **FMIs are critical elements of the HKSAR financial sector and are highly relevant in terms of domestic financial stability.** Though none is large in global terms, the financial weight of the main ones is comparable with the FMIs of other large financial sectors (the United Kingdom, the United States, and the Euro zone) in terms of GDP (Appendix II).[7]

- In terms of value of transactions, in 2012, payments settled in Hong Kong dollar CHATS were equivalent to 60 times GDP and those settled in renminbi CHATS represented 30 times GDP. Over the last three years, under the HKMA and PBoC impulse, renminbi settlement activity has grown quite rapidly, to support the growing volume of renminbi business in HKSAR. In particular, the revised Settlement Agreement on the Clearing of renminbi businesses between PBoC Hong Kong has allowed any corporation, including financial institutions, in HKSAR to open renminbi bank accounts.[8] The functionalities of the renminbi CHATS have been gradually brought in line with those of the Hong Kong dollar CHATS to ensure that the system is capable

[6] Appendix II provides the annual value processed in 2012 by the main HKSAR FMIs and other country FMIs as reference (both in billions of U.S. dollar and relative to GDP).

[8] In August 2012, banks in HKSAR started to open renminbi accounts for non-Hong Kong residents.

of supporting a full range of financial activities. In May 2013, the value of the transactions settled in renminbi CHATS exceeded that of Hong Kong dollar CHATS for the first time.

- On the securities side, the transactions settled in HKSCC amounted to 21.5 times GDP in 2012. As a CCP, HKSCC cleared an amount equivalent to 11.9 times the GDP. The stock market is among the largest in the world. As of June 2013, the total market capitalization of the stock exchange was US$2.7 trillion (HK$20.6 trillion), the sixth largest market capitalization among stock markets worldwide.
- The notional value of HKCC cleared contracts was equivalent to 22 times GDP.
- The CMU and SEOCH are of smaller sizes since their related markets are not so well developed (debt market and stock option market, respectively).

6. **Over the years, extensive domestic and overseas system linkages have been established making HKSAR a regional settlement hub.**[9] In addition to the links between the four HKSAR RTGS systems for domestic foreign exchange transactions, HKSAR has also established various payment links with other central banks in Asia (currently with Malaysia, Indonesia, and soon with Thailand) for cross-border foreign exchange transactions. There are also links with the Mainland's RTGS systems, both for cross-border foreign currency transactions and renminbi payments. Domestic SSSs are not only linked with the national currency RTGS (as is usual) but also with the foreign currency ones to enable settlement of foreign currency denominated securities, as well as intraday and overnight repos. For instance, from January to October 2013, the CMU system settled around 83 percent in Hong Kong dollar, 13 percent in renminbi, 4 percent in U.S. dollar, and 0.1 percent in euro on average in value. In addition, the U.S. dollar CHATS is linked with RENTAS, the Real-Time Electronic Transfer of Funds and Securities System in Malaysia, to settle DvP transactions for U.S. dollar-denominated debt securities traded in Malaysia. There is currently no links between domestic CCPs, nor with cross border ones. In terms of financial stability, it appears that the risk stemming is adequately managed, through an extensive use of payment versus payment (PvP) and DvP settlement arrangements and no provisional transfers of securities.

7. **The Financial Services and the Treasury Bureau (FSTB), the HKMA, and the SFC have been working together in developing a regulatory regime, as well as reporting and clearing infrastructures, for OTC derivatives.** Although the HKSAR OTC derivatives market is relatively small, due to the global nature of this market, the authorities have decided that it should comply with international standards in this respect. In June 2012, an interim measure was taken to support voluntary clearing of OTC derivatives transactions through a local CCP and the SFC was authorized to regulate and supervise a domestic CCP for OTC derivatives. Primary legislation is expected to be passed in the next few months to enable the SFC and the HKMA to impose a reporting and a clearing obligation. In the meantime, the HKMA has developed a TR for the purposes of reporting OTC derivative transactions and HKEx has set up a new CCP (OTC Clear) to clear OTC derivatives

[9] Appendix 3 provides an overview of HKSAR FMI links.

transactions. The TR is overseen by the HKMA and OTC Clear is supervised by the SFC.[10] Initial clearing and reporting will cover interest rate swaps and non-deliverable forwards, which are the major OTC derivatives products traded in HKSAR.

ASSESSMENT OF FINANCIAL MARKET INFRASTRUCTURES OVERSIGHT/SUPERVISION[11]

A. Financial Market Infrastructures Supervision and Oversight Framework

8. **All systemically important FMIs are currently subject to regulation, supervision, and oversight by either the central bank or the market regulator.** The respective legal framework and policy mandate determines the actions of the HKMA and the SFC as the two regulatory, oversight and supervision authorities for FMIs in HKSAR: the Clearing and Settlement Systems Ordinance (CSSO) empowers the HKMA to designate and oversee clearing and settlement systems that are material to the monetary or financial stability of HKSAR, or to the functioning of HKSAR as an international financial center (which includes payment systems, CSD and SSS for debt securities). The FMIs under the purview of the SFC are clearing houses (which are CSDs/SSSs and CCPs for exchange-traded transactions and, now, OTC Clear) recognized under the SFO. To avoid regulatory overlap between the HKMA and the SFC, the CSSO stipulates that the HKMA's power to designate and oversee FMIs does not cover clearing and settlement systems that are recognized as clearing houses under the SFO.

9. **The authorities should take advantage of any future revision of the SFO to explicitly prohibit a domestic entity from operating in HKSAR as a clearing house without being recognized as such.** The law does not require a domestic entity providing securities or futures clearing, settlement, or CCP services to be recognized by the SFC as a clearing house. Instead, a person providing electronic facilities to clear securities or futures contracts in HKSAR needs to be authorized just as an automated trading service, which does not impose the same statutory requirements. While, in practice, it is unlikely that a CCP, or a SSS, would operate in HKSAR without being recognized as clearing houses by the SFC, given the protections offered,[12] it would be clearer and safer to amend the law to explicitly prohibit this.

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[10] As indicated earlier, this note does not address the TR.

[11] The information supporting this assessment can be found in Appendix IV.

[12] Recognized clearing houses enjoy protection against insolvency law under the SFO. In addition, clearing houses may also want to seek recognition under the SFO for business reasons as it may be a prerequisite to obtain the recognition or approval from other overseas regulators.

10. The authorities need to continue maintaining a balance between stability considerations and the objectives of developing the clearing and settlement infrastructure. The CSSO and the SFO give each authority the objectives, functions and duties to ensure financial stability, and in doing so, request them to have regard to maintaining HKSAR as a competitive and innovative financial center. Since financial stability is essential to the attractiveness of HKSAR as a financial center, both objectives should be compatible and the firm commitment of the authorities to have all FMIs comply with the PFMIs mitigates a potential risk of conflict. This commitment should ensure Hong Kong FMIs achieve the internationally agreed level of risk management.

B. Regulatory, Supervisory, and Oversight Powers and Resources

11. The HKMA and the SFC have the powers and resources to carry out effectively their responsibilities in regulating, supervising, and overseeing FMIs. The law provides both authorities with specific and extensive powers with regard to FMIs consistent with their responsibilities, including the ability to obtain information and require change. They also get the financial and human resources needed for discharging their responsibilities. However, the additional workload generated by the adoption of the PFMIs, as well as the development of OTC derivatives infrastructures make the case for increasing capacity at the SFC (see Appendix IV for the description of both authorities' legal powers and resources).

C. Disclosure of Policies with Respect to Financial Market Infrastructures

12. The HKMA and the SFC have clearly defined and disclosed their supervisory and oversight policies with respect to FMIs. The HKMA's policies with respect to the oversight of FMIs, including the HKMA's objectives, roles, regulations and tools are set out in a Policy Statement. In addition, the HKMA has detailed its oversight framework and tools in Oversight Guidelines. Both documents are available in the banking stability section on the HKMA website, as well as assessment reports against international standards for three FMIs. The oversight activities conducted by the HKMA during the year can be found in the HKMA Annual Report. The SFC published its Guidelines on the application of the PFMIs in August 2013: while the SFO does not set out detailed regulatory requirements in respect of the duties of recognized clearing houses, the SFC makes reference to international best practices and standards for the purposes of carrying out its supervisory functions in relation to recognized clearing houses.

D. Application of the Principles for Financial Market Infrastructures

13. The HKMA and the SFC adopted the PFMIs through a joint statement in March 2013 and in their respective Guidelines that were published a few months later. Both the HKMA and the SFC have also announced they will use the "Disclosure Framework and Assessment Methodology for PFMIs" issued by CPSS/IOSCO in December 2012 to ensure consistent implementation and application of the PFMIs. More specifically, the authorities are now working with the FMIs to comply with the PFMIs and have requested each FMI to do a self-assessment against the PFMIs. The SFC has discussed the FMIs' preliminary self-assessments with the FMIs and will review each of the final self-assessments with a view to conducting its own assessment on the FMIs. OTC Clear also submitted to the SFC its self–assessment report, which is one of the key documents in support of its application to become a recognized clearing house. Going forward, the SFC intends to conduct regular assessments against the PFMIs. The HKMA has reviewed the self-assessments conducted by the FMIs under its purview and is in discussion with them on actions required to ensure observance of the principles. The HKMA intends to perform regular assessments of FMIs against the PFMIs in the future and make the results of the assessments available to the public.

14. **The authorities should clarify in which way some of the requirements apply to each of the FMIs and set a fixed timetable by which they are required to observe the PFMIs.**[13] Since all FMIs have been classified as systemically important, the authorities intend to make all of them comply with the PFMIs, without any reduction in the related requirement level. The PFMI requirement is expected to be adapted to the FMI specific situation only where the PFMIs themselves have left room for interpretation. The authorities are currently considering how best to implement the PFMIs for different systems. In doing so, they will have to clarify in which way some of the requirements apply to each of the FMIs under their purview and set a timetable for their observance. For example, the HKMA will have to decide how the current uncollateralized intraday credit granted by the settlement institution in U.S. dollar CHATS, and, to a smaller extent, by the settlement institution in euro CHATS, should be improved to comply with PFMI 4 on credit risk.[14] Given that the PFMIs do not prescribe a specific tool or arrangement to achieve the requirements for most principles and often allow for different means to satisfy a particular principle, in its August 2013 Guidelines, the SFC explained that "it appreciated that the way the PFMIs are implemented by recognized clearing houses may vary depending on the nature of their operations, functions and services provided".

15. **The HKMA has been very successful in inducing essential changes in the cash and debt securities settlement landscape over the past decade.** In particular, most of the 2003 FSAP recommendations have been promptly addressed. Through the CSSO enactment in 2004, the statutory basis for FMIs oversight has been implemented; and legal finality of payment and settlement has been ensured for all HKMA designated FMIs. In addition, foreign currency RTGS have been classified as systemically important FMIs. The operational/development and oversight functions have been clearly segregated and they report to distinct deputy chief executives.

16. **In line with the 2003 FSAP recommendation, the HKMA should pursue reducing the intraday settlement risk in the CMU.** The recommendation regarding CMU end-of-day net settlement, and the related need to withstand the default risk of the largest participant, has not been completely addressed yet. Despite the efforts that have been made to increase the proportion of real time DvP settlement, most securities transactions continue to be settled at the end of the day in a multilateral netting of both securities and payments (around 80 percent of the transactions in

[13] In January 2014, the HKMA set a deadline of end 2015 for all FMIs under its purview to achieve observance of the PFMIs.

[14] In particular, PFMI 4 on credit risk states that a payment system should cover its exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (equity can be used after deduction of the amount dedicated to cover general business risk).

terms of value),[15] making the CMU mostly a deferred net settlement system (DNS). Real time DvP is mostly used for the settlement of repos with the HKMA, which allows banks to get the liquidity they need to settle their operations in the RTGS systems. There is no specific mechanism to cope with a possible default of a participant during the day to ensure its obligations: its transactions would be revoked in case it cannot honor them. While end-of-day multilateral netting settlement brings about a significant reduction in cash and securities needs compared to other methods of offsetting obligations (bilateral netting and settlement on a gross basis), it creates interdependence among all of the participants in the system.[16] To avoid revocation of transactions and the corresponding liquidity risks, the system should be able to withstand the risk of default of the largest participant and its affiliates, as stated in PFMI 7 on liquidity risk.[17] Since the size of the debt securities market makes the benefits of a CCP relatively limited, the HKMA has planned further enhancements to provide intraday finality for most transactions, beginning with opening an additional real time gross DvP settlement window after 4:00 p.m. by the end of 2013.

17. The PFMIs are bringing additional requirements to the RTGS systems, which are in the process of being identified by the HKMA. A preliminary analysis shows that no essential feature of the systems may be impacted, except non-collateralized credit extension in U.S. dollar and euro CHATS, as discussed above. PFMI 2 on governance and PFMI 15 on general business risk should mainly impact the Hong Kong Interbank Clearing Limited (HKICL), which has to strengthen its financial situation and enhance its governance arrangements. Principle 23 on transparency should bring the four RTGS to publicly disclose all their updated relevant rules and key procedures. As for PFMI 7 on liquidity risk, it may bring the RTGS systems to conduct liquidity stress tests.

18. Inducing changes to enhance the financial risk management arrangements of the three long established clearing houses (HKSCC, HKCC, and SEOCH) has taken time. Following the recommendations of the 2003 FSAP, steps towards central bank cash settlement have been achieved: HKSCC cash settlement now occurs between the RTGS accounts of the participants' settlement bank and the RTGS account of CCASS's settlement banks (those are commercial banks, even for Hong Kong dollar CHATS). In 2011, HKEx implemented the T+2 finality arrangements for securities market cash settlement in CCASS to reduce the overnight credit risks faced by HKSCC and its participants. Finally, as a consequence of the 2008 financial crisis and the impact of Lehman Brothers Securities Asia Limited's default on HKSCC,[18] HKEx implemented risk management measures for its clearing houses in November 2012. The measures included: (i) introducing a margin

[15] 79.5 percent in 2012 and 79.6 percent from January to October 2013.

[16] Since the settlement failure of a single participant with a net debtor position prevents the settlement of the balances of all of the participants and consequently of all the transactions pending settlement

[17] PFMI 7 states that "A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday or multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions."

[18] Following the restriction notice issued by the SFC, HKSCC encountered a closing-out loss of HK$158 million mainly attributable to the lack of routine margin requirements for clearing participants.

system and a dynamic guarantee fund at HKSCC;[19] and (ii) revising certain assumptions in stress testing and collateral assumptions of the HKEx clearing houses in line with international best practices.

19. With respect to HKSCC, additional improvements are needed to address all previous FSAP recommendations. First, settlement finality should be achieved for all transactions settled by HKSCC, including when not acting as a CCP—as is the case for settlement instructions (used in particular for stock borrowing and lending, pledging securities with banks or finance companies to secure loans, and settling OTC obligations) and isolated trades (trades directly settled between two participants on a trade-by-trade basis). Then, the authorities should explore the possibility to grant a settlement account to HKSCC in the HKMA's books to reduce the credit risk of the CCP. This is backed by PFMI 9 on money settlement, which states that an FMI should conduct its money settlements in central bank money where practical and available.[20] As explained in this principle, with the use of central bank money, a payment obligation is typically discharged by providing the FMI or its participants with a direct claim on the central bank, that is, the settlement asset is central bank money. Central banks have the lowest credit risk and are the source of liquidity with regard to their currency of issue. Indeed, one of the fundamental purposes of central banks is to provide a safe and liquid settlement asset.

20. Additional important changes will be needed for the three long-established clearing houses to comply with the PFMIs.[21] Without being exhaustive, the following elements are likely to arise based on the preliminary self-assessments of these three clearing houses against the PFMIs. In particular, according to PFMI 5 on collateral, non collateralized bank guarantees should no longer be accepted as collateral by the CCPs.[22] Also, to comply with PFMI 9 on money settlement, both HKCC and SEOCH should settle Hong Kong dollar transactions through central bank accounts (currently they fully settle through commercial banks). With respect to financial resources, uncommitted repo arrangements, which are currently part of HKSCC's resources, do not qualify as eligible liquidity resources according to PFMI 7 on liquidity risk, so it remains to be analyzed whether the other available liquid resources are sufficient to cover the default of the participant with the largest exposure and its affiliates. More generally the whole liquidity arrangements of each CCP need to be assessed. PFMI 13 on participant default rules and procedures requires an FMI to test and review its default procedures with its participants and other relevant stakeholders, at least annually, which is

[19] Before that, HKSCC only relied on a fixed-amount guarantee fund and some margins for a few participants with the highest credit risks.

[20] Currently, only licensed banks (required to be members) and restricted licensed banks (on an optional basis) can open RTGS accounts at the HKMA. The rationale to limit RTGS membership to banks is to ensure that high prudential standards apply to members. However, prudential standards could be maintained at the same time when opening the system to additional members that are also submitted to those standards and close authorities' supervision. The Financial Secretary may allow other institutions to open RTGS accounts at the HKMA on a discretionary basis.

[21] As OTC Clear commenced operations just at the time of the FSAP, its compliance with the PFMIs was not discussed.

[22] Currently, the three CCPs accept both cash (including Hong Kong dollar, U.S. dollar, renminbi) and bank guarantees (Hong Kong dollar) as collateral.

currently not the case and should be in the future. As for segregation and portability arrangements, in particular in HKSCC, they may need to be improved to comply with PFMI 14.

21. For HKSCC, separating the functions of CCP and SSS/CSD into two distinct FMIs could be explored, in line with international best practices. HKSCC provides two services with distinct risk profiles as a SSS/CSD and a CCP. Resources provided by HKEx to HKSCC for its operations, including capital, are not clearly separated and earmarked between its SSS/CSD and CCP functionalities. In times of crisis this could adversely impact the discharge of its roles as a CCP and a SSS/CSD. In particular, the CSD/SSS operations could be isolated from the CCP's ones, allowing securities settlement to continue even if the CCP's activity had stopped. It is suggested that HKSCC reviews its organizational structure to facilitate the potential execution of its recovery and resolution plan.

E. Cooperation with Other Authorities

22. There is effective cooperation between the HKMA and the SFC as regards the safety and efficiency of HKSAR's FMIs. There are channels for general cooperation and information sharing between the SFC and the HKMA to discuss issues of mutual interest or that may have systemic or cross-sector implications. Both authorities signed and disclosed a MoU in 2004 to set out the scope and arrangements of consultation between both authorities regarding the supervision of recognized clearing houses. Then, in 2013, the HKMA and the SFC issued a joint statement on their adoption of the PFMIs for the FMIs under their respective purview. Apart from the regular meetings involving other regulators, the HKMA and the SFC also meet on a bilateral basis, where necessary, to discuss issues that are relevant to the two authorities. One recent example is that they have held extensive discussions on matters related to the TR and OTC Clear, the CCP for OTC derivatives. The authorities are planning to update the 2004 MoU to include OTC derivatives issues; they should take this opportunity to also include cooperation arrangements in times of crisis, which are not covered in the current version.

23. The HKMA co-operates with other central banks in the oversight of foreign currency RTGS and cross-border links, and intends to further enhance the main cooperation arrangements. There are channels for cooperation and information sharing with the New York Federal Reserve and the European Central Bank regarding U.S. dollar CHATS and euro CHATS respectively. Both authorities have received the assessment reports against the CPSS Core Principles before their publication and they get the daily turnover of each RTGS on a weekly basis. Cooperative oversight arrangements have been established between the HKMA and the Malaysian and Indonesian central banks to share oversight information during normal and crisis situations. With respect to renminbi business, in line with the MoU signed between the HKMA and the PBoC in 2003, the two authorities maintain a dialogue to review the latest developments and discuss any issues of interest, through meetings and various forms of communication at the senior and working levels. Moreover, under such cooperative arrangement, Bank of China (Hong Kong) Ltd. (BOCHK) provides regular reports on the cross-border payment flows to both the HKMA and PBoC. The HKMA is reviewing some of the arrangements with the relevant overseas regulatory authorities, taking into account the requirements under the PFMIs: it would be useful if the HKMA systematically formalized them, subject to agreement with relevant counterparties.

24. **The SFC is encouraged to continue to engage with relevant foreign authorities to minimize the negative implications of conflicts of law in the field of CCPs.** The global regulatory reforms for OTC derivatives clearing and trade reporting potentially expose the CCPs and some of their participants to legal risk due to conflicts of laws. OTC derivatives reforms in the United States (U.S.) and the European Union (EU) may have extra-territorial implications for Hong Kong CCPs, as well as market participants. Under the Dodd-Frank Act, U.S. incorporated entities are prohibited from participating in OTC Clear unless OTC Clear is registered as a derivatives clearing organization with the US Commodity Futures Trading Commission or exempted from such registration. In the same spirit, a CCP established in a third country can provide clearing services to EU entities only where it is recognized by the European Securities and Markets Authority (ESMA), even when the CCP is clearing products other than OTC derivatives. HKSCC therefore applied in September 2013 to be recognized as a third-country CCP by ESMA.[23] [24] The SFC is encouraged to continue its discussions with relevant foreign authorities to minimize the negative implications of conflicts of law, such as inconsistencies and legal uncertainty, or even level playing field issues for some market participants.

25. **It is essential that further steps be taken to reflect the latest FSB requirements on effective resolution regimes for FMIs.** As part of its policy measures to reduce the risk posed by systemically important financial institutions, the FSB issued the Key Attributes of Effective Resolution Regimes for Financial Institutions in November 2011. All member jurisdictions of the FSB and G20 are expected to meet these new international standards to ensure that both public authorities and financial institutions are better placed to respond effectively to shocks that threaten to undermine the financial soundness of individual financial institutions (including FMIs). In 2012, the FSB coordinated a self-assessment by jurisdictions of how far their existing arrangements for contingency planning and dealing with distressed firms met the new standards. This work confirmed that although the statutory and regulatory framework in HKSAR was relatively well-developed before the global financial crisis, further strengthening was now needed to reflect the latest best practices for effective resolution regimes. The authorities are currently working on implementing a comprehensive resolution regime, which will cover FMIS.[25] The authorities are encouraged to ensure the necessary legislation is implemented as soon as feasible, and at the very least in line with current expectations of 2015. In the meantime, the authorities should develop a recovery and resolution plan for each FMI. It would either allow the critical services of the FMI to be sustained or for the FMI's winding down to be conducted in an orderly manner.

[23] There are currently a few branches of major European banks participating in HKSCC.

[24] In January 2014, OTC Clear also submitted an application for recognition as a third-country CCP by ESMA.

[25] The authorities launched the first stage of public consultation on the initial thinking and proposals for establishing an effective resolution regime for financial institutions in Hong Kong on January 7, with a view to providing the authorities with powers to resolve non-viable financial institutions (including FMIs) without severe systemic disruption whilst protecting taxpayers. It is expected that, following a second stage of public consultation during 2014, draft legislation would be introduced to the Legislative Council for consideration in 2015.

Appendix I. Overview of Financial Market Infrastructures

26. There are currently nine FMIs located in HKSAR. Four large-value interbank payment systems, namely Hong Kong dollar CHATS, U.S. dollar CHATS, euro CHATS and renminbi CHATS, handle settlement on an RTGS basis for interbank payments denominated in Hong Kong dollar, U.S. dollar, euro, and renminbi respectively. In addition, securities traded in HKSAR are cleared and settled through two distinct SSSs, namely the CMU operated by the HKMA for the clearing and settlement of OTC transactions on government-issued and private sector debt securities, and the CCASS operated by the HKSCC for the clearing and settlement of securities traded on SEHK. Both the CMU and the CCASS act as CSDs, and CCASS is also a CCP for the exchange traded transactions on the cash market. HKCC and SEOCH act as CCPs and use a common clearing and settlement system, the DCASS, for clearing the derivatives contracts traded on HKFE and stock options contracts traded on SEHK. Finally, HKEx launched a new CCP for OTC derivatives (OTC Clearing Hong Kong Limited—OTC Clear) in November 2013. The following tables provide the main characteristics of each FMI.

Table 2. Hong Kong SAR: Overview of Payment Systems

FMI Name	System Name	Scope	Overseer	System Operator	Settlement Institution
HKD CHATS	HKD CHATS	RTGS for interbank payments denominated in Hong Kong dollar	HKMA	HKICL[26]	HKMA
USD CHATS	USD CHATS	RTGS for interbank payments denominated in USD	HKMA	HKICL	HSBC
EUR CHATS	EUR CHATS	RTGS for interbank payments denominated in EUR	HKMA	HKICL	Standard Chartered Bank (Hong Kong) Ltd. (SCBHK)
RMB CHATS	RMB CHATS	RTGS for interbank payments denominated in RMB	HKMA	HKICL	BOCHK

[26] HKICL is a private company jointly owned by the HKMA and Hong Kong Association of Banks.

Table 3. Hong Kong SAR: Overview of Central Securities Depositories, Securities Settlement Systems, and Central Counterparties for Financial Instruments

FMI Name	System Name	Scope	Supervisor /Overseer	Owner	Operator	Cash Settlement
Central Money Markets Unit (CMU)	CMU	SSS and CSD for public and private debt securities, including investment funds, denominated in Hong Kong dollar and other major currencies	HKMA	HKMA	HKMA (HKICL operates the computer system on behalf of HKMA)	CHATS (HKD, USD, EUR, RMB)
HKSCC	CCASS	SSS, CSD, and CCP for securities traded on the SEHK, denominated in Hong Kong dollar and other major currencies	SFC	HKEx	HKSCC	CHATS (HKD, USD, RMB) and commercial banks[27]
SEOCH	DCASS	CCP for exchange-traded derivatives (stock options)	SFC	HKEx	SEOCH	Commercial banks
HKCC	DCASS	CCP for exchange-traded derivatives (equity index futures and options, stock futures, RMB currency futures, gold futures, and interest rates and fixed income futures)	SFC	HKEx	HKCC	Commercial banks
OTC Clear	OCASS	CCP for OTC derivatives	SFC	HKEx	OTC Clear	CHATS (HKD, USD, EUR, RMB) and commercial banks[28]

[27] HKSCC, which does not have a banking license, is not currently eligible for membership in the RTGS systems and uses commercial banks as its settlement banks to make and receive payments on its behalf

[28] OTC Clear appoints various settlement banks for different currencies for daily settlement; five sub-accounts are opened for each currency for different settlement purposes.

Appendix II. Comparative Financial Market Infrastructure Turnover Figures

Table 4. Hong Kong SAR: Comparative Real Time Gross Settlement Turnover Figures

RTGS	Country	2012 Annual Value (USD billion)	2012 Annual Value (in GDP times)
TARGET2	Euro Area	912 904	74.1
Fedwire	USA	599 201	36.9
BOJ-NET	Japan	341 479	57.3
HVPS	China	280 712	33.6
CHAPS Sterling	UK	113 607	45.8
BOK-Wire+	Korea	49 967	44.3
K-RIX	Sweden	18 364	35.0
HKD CHATS	HKSAR	15 806	60.1
MEPS+	Singapore	14 151	51.1
RMB CHATS	HKSAR	7 866	29.9
USD CHATS	HKSAR	4 048	15.4
EUR CHATS	HKSAR	185	0.7

Table 5. Hong Kong SAR: Comparative Securities Settlement System/Central Securities Depository

SSS/CSD	Country	2012 Annual Value (USD billion)	2012 Annual Value (in GDP times)
NBES	USA	284 402	17.5
BOJ JGB	Japan	258 516	43.4
CREST	UK	183 955	74.1
SD&C	China	33 240	4.0
HKSCC	HKSAR	5 647	21.5
KSD	Korea	5 530	4.9
CMU	HKSAR	834	3.2

Table 6. Hong Kong SAR: Comparative Central Counterparty Turnover Figures

CCP	Country	2012 Annual Value (USD billion)	2012 Annual Value (in GDP times)
LCH Clearnet Ltd	UK	919 100	370.3
Eurex	Germany	247 156	72.8
NSCC	USA	185 700	11.4
JGBCC	Japan	30 277	5.1
SD&C	China	9 944	1.2
HKSCC	HKSAR	3 123	11.9
Korea Exchange	Korea	400	0.4
HKCC[29]	HKSAR	5 714	22
SEOCH[30]	HKSAR	140	0.5

Sources: Bank for International Settlement— Statistics on payment, clearing and settlement systems in the CPSS countries (Redbook): Figures for 2012, and HKEx for HKCC and SEOCH data

[29] Contract Volume (Notional value.)

[30] Contract Volume (Notional value)

Appendix III. Overview of Financial Market Infrastructure Links

Links Between Payments Systems

27. The HKMA has developed PvP links between the four RTGS systems to facilitate foreign exchange transactions. The four CHATS are linked up with each other for the settlement of USD/HKD, EUR/USD, USD/RMB, EUR/HKD, EUR/RMB, RMB/HKD foreign exchange transactions. The PvP device ensures that both legs of the foreign exchange transaction are settled simultaneously to eliminate principal risk: bank A is paying bank B in one RTGS system (in one currency) at the same time bank B (or its correspondent bank) is paying bank A (or its correspondent bank) in the other RTGS system (in the other currency). With PvP settlement and the consequent elimination of Herstatt risk,[31] traded currencies can be put to immediate use in the respective clearing systems, thus improving interbank liquidity.

28. The HKMA has also established cross-border payment links with other central banks in Asia. The key system links include the cross-border PvP link between Hong Kong's U.S. dollar CHATS and Malaysia's ringgit RTGS system, and the PvP link between Hong Kong's U.S. dollar CHATS and Indonesia's rupiah RTGS system for U.S. dollar/Malaysia's ringgit and U.S. dollar/Indonesia's rupiah PvP, respectively. The HKMA and Bank of Thailand have been working closely for the launch of a new PvP link between Hong Kong's U.S. dollar CHATS and Thailand's baht RTGS system in the second half of 2014. These PvP links improve settlement efficiency and eliminate settlement risk arising from time lags in settlements and from time-zone differences.

29. In addition, the HKMA has also been working closely with Mainland authorities in providing cross-border settlement arrangements for payments settlement to facilitate cross-border business. Such arrangements include payment links, cross-border check clearing and direct debit arrangements, involving Hong Kong dollar, U.S. dollar, renminbi, and euro and covering Macau, Shenzhen, Guangdong as well as other cities in the Mainland. In particular, the renminbi CHATS is linked to the China National Advanced Payment System (RTGS in Mainland China) for cross-border remittance service to and from the Mainland.

[31] On June 26, 1974, German regulators forced the troubled Bank Herstatt into liquidation. That day, a number of banks had released payments of Deutsche Marks to Herstatt in Frankfurt in exchange for U.S. dollars that were to be delivered in New York City. Because of time-zone differences, Herstatt ceased operations between the times of the respective payments. The counterparty banks did not receive their U.S. dollar payments.

Links Between Real Time Gross Settlement and Securities Settlement Systems

30. Domestic SSSs are not only linked with the national currency RTGS, as is usual, but also with the foreign currency ones. With the interface between the four CHATS and the CMU, the CHATS supports the real-time and end-of-day DvP facilities for debt securities denominated in Hong Kong dollar, U.S. dollar, euro and renminbi that are lodged with the CMU. Furthermore, these interfaces enable automatic intraday repos, as a means of providing intraday liquidity to the participants of these RTGS systems. A new liquidity saving device, the RTGS Liquidity Optimizer and a new DvP function for supporting listing of renminbi-denominated securities on SEHK were recently added to the renminbi CHATS. A similar interface has also been established between Hong Kong dollar, U.S. dollar, and renminbi CHATS and CCASS. Market participants can make use of this linkage for a real-time and an end-of-day DvP for Hong Kong dollar, U.S. dollar, and renminbi denominated shares listed on SEHK.

31. In addition, the U.S. dollar CHATS is linked with RENTAS, the Real-Time Electronic Transfer of Funds and Securities System in Malaysia, to settle DvP transactions for U.S. dollar denominated debt securities traded in Malaysia. Mechanisms of settling cross border DvP transactions are similar to that of PvP transactions, except that the system linkage for the former is between a payment system and a SSS whereas the latter is between two payment systems.

Links Between Domestic Securities Settlement Systems (HKSCC and CMU)

32. HKSCC participants can receive or deliver Exchange Fund Bills and Notes (EFBN)/Government Bonds/CMU instruments from or to CMU Members via HKSCC. HKSCC supports both free of payment and delivery against payment transactions. No credit extensions and provisional transfers of securities between HKSCC and the CMU across the CSD link are allowed.

Links Between Domestic CCPs and Securities Settlement Systems

33. CMU acts as a custodian for HKCC and SEOCH to safeguard their own and their participants' EFBN.

34. SEOCH resorts to HKSCC for clearing and settling exercised options trades. As the underlying stocks/exchange-traded funds (ETFs) of stock options contracts traded at SEHK are eligible securities of HKSCC, HKSCC admits SEOCH as a clearing agency participant to facilitate the clearing and settlement of exercised options trades.

Cross-border Securities Settlement Links

35. The CMU has developed two-ways links with International CSDs to 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. Those links are mainly used by overseas investors to purchase bonds in HKSAR. From January to October 2013, on average, a daily value of over HK$2 billion was settled through the links with Euroclear and Clearstream. Securities transactions with Euroclear Bank can be settled on DvP basis to reduce settlement risk and liquidity risk. A purchase DvP transaction will only be executed upon receipt of funds from the buyer. No credit will be granted in any circumstances. Sales proceeds for a sale instruction will only be re-transferred when the sale is completed in the linked CSD.

36. Since June 2012, the CMU has been part of global triparty repo arrangements with Euroclear Bank and J.P. Morgan to provide a cross-border collateral management service. This enables international financial institutions to use securities held with the relevant global triparty repo systems as collateral in triparty repo transactions with CMU participants to access liquidity from HKSAR. The service aims to promote the repo market in HKSAR, which in turn helps enhance financial stability through the greater use of collateral to cover exposures in secured lending and borrowing. It has opened a channel for financial institutions to widen their liquidity sources and obtain offshore renminbi liquidity from Hong Kong.

37. There is also a cross-border free-of-payment transfer link between HKSCC and the Depository Trust Company (DTC) in the United States to allow HKSCC Participants to transfer or receive their Nasdaq securities via HKSCC's account at the DTC to HKSCC.[32] As HKSCC only offers its participants free of payment transfers of U.S. Securities between HKSCC and the DTC, the credit and liquidity risks arising from the DTC link are minimal. HKSCC is not required by the DTC to make any deposit to its participants fund as HKSCC does not use any DvP services of the DTC. No provisional transfers of securities between HKSCC and the DTC across the CSD link are allowed.

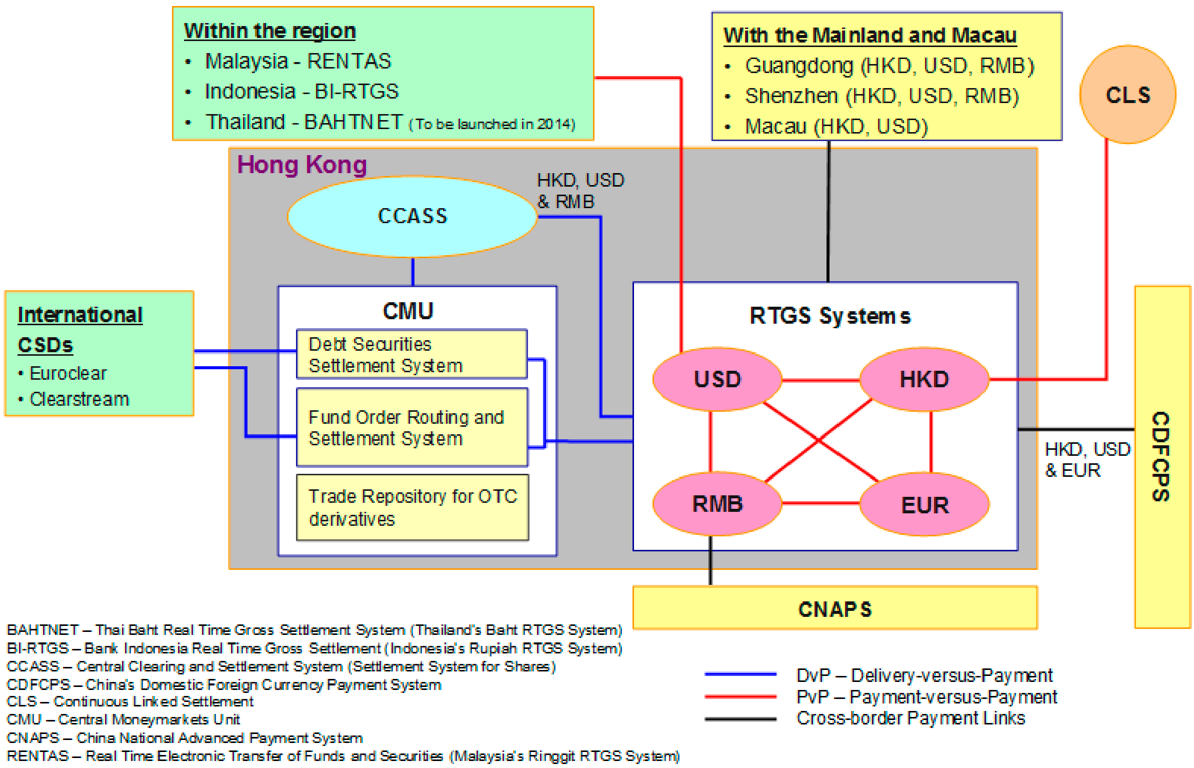
38. HKCC appoints Clearstream Banking S.A. as a custodian for holding U.S. Treasuries under a contract that clearly defines the obligations and liabilities in operating the HKCC custody account.

Cross-border Central Counterparty Links

39. Currently, none of the Hong Kong CCP is engaged in cross border activities. CCP links are the riskier ones, in terms of credit exposures; however, there is currently no links with cross border CCPs. In addition, HKSCC, HKCC, and SEOCH do not accept remote participants from overseas jurisdictions (they do accept foreign financial institutions as participants provided they are located in HKSAR).

[32] There are currently seven Nasdaq securities traded on SEHK, e.g. Microsoft and SPDR Gold Trust, etc.

Figure 2. Hong Kong SAR: Overview of Main Financial Market Infrastructure Links



Source: Hong Kong Monetary Authority.

Appendix IV. Overview of Financial Market Infrastructure Oversight and Supervision

Regulation, Supervision, and Oversight

40. The HKMA and the SFC are the two regulatory, oversight and supervision authorities for FMIs in HKSAR. Payment systems, CSD and SSS for debt securities and TR are overseen by the HKMA. The SFC supervises CCPs, CSD and SSSs for securities (which include shares, stock options and derivatives) and futures contracts. All systemically important systems are regulated by either the HKMA or the SFC. The FMIs are supervised based on the respective legal framework and policy mandate of the two regulators: the CSSO, which came into force in November 2004, empowers the HKMA to designate and oversee clearing and settlement systems that are material to the monetary or financial stability of HKSAR, or to the functioning of HKSAR as an international financial center. The FMIs under the purview of the SFC are clearing houses recognized under the SFO. To avoid regulatory overlap between the HKMA and the SFC, the CSSO stipulates that HKMA's power to designate and oversee FMIs does not cover clearing and settlement systems that are recognized as a clearing house under the SFO.

Hong Kong Monetary Authority

41. The HKMA is the government authority in HKSAR responsible for maintaining monetary and banking stability. Its main functions are: (i) maintaining currency stability within the framework of the Linked Exchange Rate system; (ii) promoting the stability and integrity of the financial system, including the banking system; (iii) helping to maintain Hong Kong's status as an international financial center, including the maintenance and development of Hong Kong's financial infrastructure; and (iv) managing the Exchange Fund. The Monetary Authority is appointed by the Financial Secretary (FS). It is funded through the Exchange Fund, which comprises the monetary reserves in HKSAR.

42. The HKMA performs its role under the CSSO as an overseer of the important clearing and settlement systems with the aim of promoting their safety and efficiency. More specifically, the scope of responsibilities of the HKMA under the CSSO includes (i) the designation and oversight of clearing and settlement systems and their links; (ii) monitoring the compliance of designated systems with the safety and efficiency requirements stipulated in the CSSO; (iii) instigating changes to designated systems to bring them into compliance with the requirements where appropriate; (iv) issuing a certificate of finality to a designated system if it meets the criteria specified in the CSSO; and (v) issuing guidelines to explain the HKMA's role, policies and requirements in relation to the designation and oversight of clearing and settlement systems under the CSSO. FMIs are required to seek the approval of the HKMA under the CSSO for any new cross-border links that require changes to operating rules and procedures.[33]

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[33] As an example, the HKMA will have to assess the risks of the planned RTGS link with BAHTNET, the Thailand RTGS. In particular, since one of the 2007/2008 Thailand FSAP's finding was that there was no explicit legal protection for

(continued)

43. Currently, six systems are designated under the CSSO, namely, the CMU, the clearing and settlement system for debt securities, Hong Kong dollar CHATS, U.S. dollar CHATS, euro CHATS, renminbi CHATS (the RTGS systems), and the Continuous Linked Settlement (CLS) System. The first five are local designated systems and CLS is based in the United States (it is primarily regulated by its home supervisor, the U.S. Federal Reserve). The HKMA has long considered that retail payment systems were in general not systemically significant enough to be designated under the CSSO. However, the HKMA has encouraged the retail payment industry to adopt a self-regulatory approach by issuing codes of practice to promote the system's safety and efficiency and monitors the industry's compliance with those codes of practice. With the rapid development of innovative retail payment products and services over the past few years, the FSTB and the HKMA jointly issued a public consultation paper in May 2013 to propose amending the CSSO to, among others, include a designation regime to empower the HKMA to designate and oversee retail payment systems that are important to the general public and financial stability, and to exercise the related supervisory and oversight functions.

Securities and Futures Commission

44. The SFC is an independent statutory body set up to regulate the securities and futures markets in HKSAR. The SFC works to ensure orderly securities and futures market operations, to protect investors, and to help promote HKSAR as an international financial centre and a key financial market in China. Its mandate stems from the SFO which requires the SFC, in the pursuit of its functions, to have regard to the desirability of maintaining the status of HKSAR as a competitive international financial center and in facilitating innovation as well as the regulation of the securities and futures markets, and the prevention of systemic risk in such markets. The SFC is funded from levies on market participants, but its budget must be approved by the FS.

45. The SFO empowers the SFC to recognize clearing houses (the term "clearing house" covers SSSs/CSDs and CCPs) and exchange controllers (persons who control clearing houses) and imposes some specific duties on recognized clearing houses and exchange controllers. Under the SFO, the SFC may recognize a company as a clearing house if it is satisfied that doing so is (i) in the interest of the investing public or in the public interest; or (ii) for the proper regulation of markets in securities and futures contracts.

46. In addition to the three long established recognized clearing houses, namely HKSCC for the cash market, HKCC for the derivatives market, and SEOCH for the stock options market, OTC Clear was recently set up to clear OTC derivatives transactions. The SFO requires they ensure that (i) there are orderly, fair and expeditious clearing and settlement arrangements for securities or futures contracts cleared or settled through them; and (ii) risks associated with their business and operations are managed prudently.

settlement finality in Thailand, the HKMA will have to carefully assess the related potential legal risk for U.S. dollar CHATS.

Regulatory, Supervisory, and Oversight Powers and Resources

Hong Kong Monetary Authority

47. The MA has extensive powers under the CSSO in relation to designated FMIs; they include:

- power to approve changes to the operating rules of a designated system;
- power to request information or documents relating to a designated system;
- power to direct a designated system to take such action as the HKMA considers necessary to bring it compliance with the applicable requirements;
- power to direct a designated system to make such amendments to its operating rules as the HKMA considers necessary to bring the rules into compliance with the applicable requirements;
- power to suspend or revoke a certificate of finality issued to a designated system;
- power to revoke the designation of a designated system;
- power to issue guidelines.

48. The HKMA has set out in its oversight guidelines the scope of information that FMIs are required to provide for oversight purposes. In general, FMIs are requested to provide monthly information on transaction volumes, system performance statistics, incidents of default and non-compliance with requirements, changes in participants, and significant events for the reporting month and the coming three months (release of new services, drills, updated operating rules), which may have risk implications for FMIs. The HKMA also requires FMIs to provide supplementary information for off-site reviews. The information includes, but is not limited to, submissions of periodic auditor's reports on various risk areas, business continuity plans, data on financial position, development plans, and any other ad-hoc information. In addition, FMIs are required to report to the HKMA as soon as possible any delays or abnormal events in their operations.

49. The HKMA conducts annual off-site assessments of each designated FMI. The annual assessment identifies any areas for improvement for each system. The HKMA holds annual meetings with senior management of the system operator and the settlement institution of each designated FMI to discuss the findings of the off-site reviews (and on-site examinations if conducted), particularly any significant deficiencies in safety and efficiency identified, or any other matters of concern or mutual interest. The meetings also enable the HKMA to better understand how they view and control risks and how they assess their business situation and future development. In addition, HKMA meets with HKICL on a quarterly basis to discuss progress on undergoing projects, financial performance, manpower issues.

50. The oversight is performed by the Payment Systems Oversight (PSO) Team of the Payment Systems Oversight and Licensing Division under the Banking Conduct Department of the HKMA. The PSO Team is separate and independent from the Financial Infrastructure Department (FID) of the HKMA which acts as the Hong Kong dollar settlement institution and the CMU owner and operator. The PSO Team and the FID have separate reporting lines to different Deputy Chief Executives of the HKMA. The PSO Team consists of one Division Head leading two separate units, each staffed with one senior manager and one manager. The PSO Team comprises members with different backgrounds and experiences in payment operation, research, public relations, etc. One assistant manager position with information technology/audit skills was added in 2013 to assist the team with the implementation of the PFMIs.

Securities and Futures Commission

51. The SFC supervises, monitors and regulates the activities of the recognized clearing houses and exchange controllers mainly through: (i) approving their rules and rule amendments; (ii) approving the appointment of Chief Executive or Chief Operating Officer of a recognized exchange controller; (iii) reviewing or auditing their operations, clearing systems and risk management functions, including through on-site inspection;[34] (iv) requiring them to produce their books and records kept in respect of any clearing and settlement arrangements, and such other information relating to their business or any clearing and settlement arrangements; and (v) receiving a copy of their report upon completion of any default proceedings.

52. HKEx has been providing the SFC with a wide range of information relating to its clearing and settlement operations, regulation and risk management functions and financial condition. The SFC also holds regular meetings with HKEx's senior management and working level staff to review and discuss major strategic plans of HKEx, regulatory policy initiatives that affect HKEx and operational issues. Currently, the information provided by HKEx to the SFC includes: real time electronic access to CCASS terminal and DCASS terminal; details of intraday margin calls including the number of clearing participants and amounts involved and participants who failed to meet the margin call; monthly reports on CCASS Trade, Settlement & Depository Statistics, summary on measures of handling late delivery and margin deposits received from participants of HKSCC, HKCC and SEOCH; weekly reports on statistics information on trade and settlement activities in CCASS; daily summary reports of exemption and buy-in of HKSCC; updated cross market contingency plan; monthly financial statements of HKSCC Guarantee Fund, HKCC Reserve Fund and SEOCH Reserve Fund; periodic sensitivity analysis reports of the HKSCC Guarantee Fund, HKCC Reserve Fund and SEOCH Reserve Fund under different market scenarios and default rate assumption; and weekly reports on stress testing results of the adequacy of HKSCC Guarantee Fund, HKCC Reserve Fund and SEOCH Reserve Fund.

[34] The SFC is planning to conduct an onsite review of HKEx and its clearing houses in 2014. The purpose of the onsite review is to assess how well HKEx and its clearing houses are discharging their respective statutory duties specified in the SFO.

53. **The SFC benefits from extensive enforcement powers.** The SFC may, after consultation with the FS, withdraw the recognition of the clearing house or direct it to cease providing or operating clearing or settlement facilities if it fails to comply with any requirement of the SFO or with a condition imposed by the SFC for recognition. The SFC may request a recognized clearing house to make certain specified rules or amend its rules after consultation with the FS and the clearing house. If the clearing house fails to comply with such a request, the SFC may make or amend the rules as requested on behalf of the clearing house. The SFC may also, after consultation with the FS, suspend: (i) the functions of the board of directors or governing body of the clearing house or exchange controller; (ii) functions of a director or a member of the governing body; (iii) functions of a committee or sub-committee established by the board or the governing body; and (iv) the functions of the chief executive officer.

54. **The Supervision of Markets (SOM) division oversees the operations of the HKEx and its subsidiaries.** The SOM division is responsible for, among others, the following areas: (i) supervising and monitoring activities of the recognized exchange controller, recognized exchanges and recognized clearing houses; (ii) monitoring market activities and assessing potential systemic risks; and (iii) conducting research on developments in Hong Kong markets and other major financial markets to assist in the formulation of policies. The SFC staff has knowledge about, and working experience in, different aspects of the financial market, ranging from financial products, quantitative analysis, and risk management to market operations. Out of 34 staff in the SOM division, the SFC estimates that around a dozen are dealing more specifically with clearing houses' supervision (but not only with it since they are covering several market related issues).

Disclosure of Policies with Respect to Financial Market Structures

Hong Kong Monetary Authority

55. **The HKMA clearly defines and discloses its policies with respect to FMIs, which include the authorities' objectives, roles, and regulations.** The HKMA's policies with respect to the oversight of FMIs, including the HKMA's objectives, roles, regulations and tools are set out in a Policy Statement. In addition the HKMA has detailed its oversight framework and tools in Oversight Guidelines. Both documents are available in the "Oversight of Financial Market Infrastructures" in the banking stability section on the HKMA website, as well as assessment reports against international standards for three FMIs. The oversight activities conducted by the HKMA during the year can be found in the HKMA Annual Report.

Securities and Futures Commission

56. **Pursuant to the HKMA/SFC joint statement released on March 28, 2013 announcing their commitment to adopt the PFMIs, the SFC issued the Guidelines on the application of the PFMIs in August 2013, which are available on SFC's website.** While the SFO does not set out detailed regulatory requirements in respect of the duties of recognized clearing houses, the SFC is making reference to international best practices and standards for the purposes of carrying out its

supervisory functions in relation to recognized clearing houses. The SFC had not disclosed assessment against the previous CPSS-IOSCO standards, but intends to do so with the PFMIs.

Application of the Principles for Financial Market Infrastructures

57. **The HKMA and the SFC issued a joint statement on March 28, 2013 on their adoption of the PFMIs to the FMIs under their purview: all systemically important FMIs designated as such by one or the other authorities are therefore to apply the PFMIs.** Both the HKMA and the SFC have announced they will use the "Disclosure Framework and Assessment Methodology for PFMIs" issued by CPSS/IOSCO in December 2012 to ensure consistent implementation and applications of the PFMIs, within and across jurisdictions. More specifically, the authorities are now working with the FMIs to comply with the PFMIs and have requested each FMI to do a self-assessment against the PFMIs. The SFC has discussed the FMIs' preliminary self-assessments with the FMIs and will review the final self-assessments performed by the FMIs with a view to conducting its own assessment on the FMIs. OTC Clear also submitted its self–assessment report to the SFC, which is one of the key documents in support of its application to become a recognized clearing house. The SFC intends to conduct regular assessments against the PFMIs in the future. The HKMA has reviewed the self-assessments of the FMIs under its purview and is in discussion with them on actions required to ensure observance of the principles. The HKMA intends to perform regular assessments of FMIs against the PFMIs in the future and make the results of the assessments available to the public.

58. **The Process Review Committee (PRC), composed of independent members, was set up by the Chief Executive of the HKSAR Government in 2004 to review the processes and procedures adopted by the HKMA in overseeing the FMIs operated by the HKMA to ensure that the same set of oversight standards is applied to all the designated systems under the CSSO.** The PRC submits annual reports and, if appropriate, special reports to the FS. The annual reports of the PRC are published in full on the HKMA website to promote transparency. In addition, an independent Clearing and Settlement Systems Appeals Tribunal was established in 2004 to hear appeals against decisions of the Monetary Authority on designation and related matters under the CSSO. There has been no appeal since the establishment of the tribunal.

Cooperation with Other Authorities

Domestic cooperation

59. **Although there is no overlap of oversight of FMIs in HKSAR, there are channels for general cooperation and information sharing between the SFC and the HKMA.** Those channels are used to discuss issues of mutual interest or that may have systemic or cross-sector implications, since a failure of an FMI may affect the monetary or financial system in general and may have implications on other FMIs. Both authorities signed and disclosed a MoU in 2004 to set out the scope and arrangements of consultation between both authorities regarding the supervision of

recognized clearing houses. On March 28, 2013 the HKMA and the SFC issued a joint statement[35] on their adoption of the PFMIs to the FMIs under their respective purview. Apart from the regular meetings involving other regulators, the HKMA and the SFC also meet on a bilateral basis, where necessary, to discuss issues that are relevant to the two authorities. One recent example is that the HKMA and the SFC have held extensive discussions on matters related to the OTC Derivatives Trade Repository of HKMA and OTC Clear.

60. There is no legal impediment for sharing information between the HKMA and the SFC. SFO permits the disclosure of information by the SFC to the HKMA if the SFC is of the opinion that it is desirable or expedient to do so in the interest of the investing public or in the public interest or the disclosure will enable or assist the HKMA to perform its functions and such disclosure is not contrary to the interest of the investing public or to the public interest. There are similar confidentiality requirements under the CSSO, which permits the disclosure of information by the HKMA to the SFC, provided such disclosure is not contrary to the public interest, and if the HKMA is of the opinion such disclosure will assist the SFC in the exercise of its functions.

Cross-border cooperation

Hong Kong Monetary Authority

61. The HKMA co-operates with other central banks in the oversight of foreign currency RTGS and cross-border links. There are channels for cooperation and information sharing with New York Fed and European Central Bank regarding U.S. dollar CHATS and euro CHATS respectively. Both authorities have received the assessment report against the Core CPSS Principles before their publication and they get the daily turnover of each RTGS on a weekly basis. For the links with U.S. dollar CHATS, co-operative oversight arrangements have been established between the HKMA and the Bank Negara Malaysia and the Bank Indonesia to share oversight information during normal and crisis situations. The co-operative oversight arrangements were documented and agreed between the parties concerned. With respect to renminbi business, further to a MoU signed between the HKMA and the PBoC in 2003, the two authorities maintain dialogue to review the latest developments and discuss any issues of interest, through meetings and various forms of communications at the senior and working levels. Moreover, under such a cooperative arrangement, the BOCHK provides regular reports on the cross-border payment flows to both the HKMA and PBoC, and the two authorities also share information as and when needed. The HKMA is reviewing some of the existing arrangements with the relevant overseas regulatory authorities, taking into account the requirements under the PFMIs.

62. For the CMU, based on the actual turnover and the risk profile of each link, the HKMA is in the process of discussing with the relevant overseas regulatory authorities to establish the appropriate co-operative oversight arrangements.

[35] The joint statement is available on the website of the HKMA and the SFC:
http://www.hkma.gov.hk/eng/key-information/press-releases/2013/20130328-6.shtml
http://www.sfc.hk/edistributionWeb/gateway/EN/news-and-announcements/news/doc?refNo=13PR28

63. The HKMA participates in the international cooperative oversight of the CLS System. CLS is a designated system in HKSAR but primarily regulated by its home supervisor, the U.S. Federal Reserve. The HKMA participates in the international cooperative oversight with the U.S. Federal Reserve and other central banks, through the CLS Oversight Committee.

Securities and Futures Commission

64. HKSCC, HKCC, and SEOCH do not accept remote participants from overseas jurisdictions. Apart from the cross-border free-of-payment transfer link between HKSCC and DTC, the three long-established clearing houses do not currently engage in cross border activities. They have foreign participants, which have to be located in HKSAR. Under the current business models of the clearing houses, the SFC is their sole regulator. DTC is supervised by the Securities and Exchange Commission in the United States (SEC). An MoU in relation to co-operative arrangements on investigatory assistance and exchange of information was signed between the SFC and the SEC. Both the SFC and the SEC are signatories to the IOSCO Multilateral MoU, concerning consultation, co-operation and exchange of information. These MoUs help the respective regulators to consult and cooperate in the enforcement of securities' laws.

65. The SFC has entered into discussions with relevant foreign authorities to minimize the negative implications of conflicts of law in the field of CCPs. Indeed, the global regulatory reforms for OTC derivatives clearing and trade reporting potentially expose the CCPs and their foreign participants to legal risk due to conflicts of laws. In particular, OTC derivatives reforms in the United States and the EU may have extra-territorial implications for Hong Kong CCPs as well as market participants. Under the Dodd-Frank Act, U.S. incorporated entities are prohibited from participating in OTC Clear, unless OTC Clear is registered as a derivatives clearing organization with the U.S. Commodity Futures Trading Commission or exempted from such registration. In the same spirit, a CCP established in a third country can provide clearing services to EU entities only if it is recognized by the ESMA, even when the CCP is clearing products other than OTC derivatives.[36] HKSCC therefore applied in September 2013 to be recognized as a third-country CCP by ESMA.[37]

[36] There are currently a few branches of major European banks participating in HKSCC.

[37] In January 2014, OTC Clear also submitted an application for recognition as a third-country CCP by ESMA.