
SUPERVISION OF FINANCIAL MARKET INFRASTRUCTURES IN SINGAPORE

Monetary Authority of Singapore

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	<i>Contents</i>	<i>Page</i>
1	Introduction	1
2	Supervisory Objectives	3
3	Regulatory Framework	4
4	Supervisory Approach	8
5	FMI Subject to Cooperative Oversight	11
	Annex A: Financial Market Infrastructures Supervised by MAS	12
	Annex B: Financial Market Infrastructures Subject to Cooperative Oversight	15

MONETARY AUTHORITY OF SINGAPORE

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1 Introduction

1.1 Financial market infrastructures (“FMI”) that facilitate the clearing, settling, or recording of payments, securities, derivatives or other financial transactions are key components of the financial system, and play a critical role in fostering financial stability. FMIs that are not properly managed can pose significant risks to the financial system and be a potential source of contagion. This monograph describes the approach of the Monetary Authority of Singapore (“MAS”) in its supervision¹ of FMIs in Singapore.

International Standards

1.2 MAS adopts the *Principles for Financial Market Infrastructures* (“PFMI”) when carrying out its supervision of FMIs. The PFMI was issued by the Committee on Payments and Market Infrastructures² (“CPMI”) and the International Organization of Securities Commissions (“IOSCO”) in April 2012, following a comprehensive review of three pre-existing sets of standards for FMIs – the *Core Principles for Systemically Important Payment Systems* (“CPSIPS”), the *Recommendations for Securities Settlement Systems* (“RSSS”), and the *Recommendations for Central Counterparties* (“RCCP”). The PFMI, which sets the benchmark for the supervision of FMIs, are expressed as broad principles, in recognition of the differences amongst FMIs, and provide guidance to FMIs and authorities on the identification, monitoring, mitigation and management of the full range of risks that arise in or are transmitted by FMIs.

1.3 The PFMI defines an FMI as a multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling, or recording payments, securities, derivatives or other financial transactions. There are five key types of FMIs:

- (a) *Payment systems*: A payment system is a set of instruments, procedures, and rules for the transfer of funds between or among participants; the system

¹ Regulation refers to the establishment of specific rules of behaviour to which FMIs are required to adhere while supervision refers to the monitoring of the behaviour of FMIs, including compliance with rules and regulations. When the term “supervision” is used in isolation, we intend it to mean the broad oversight of the FMIs, including both regulation and supervision.

² Formerly known as the Committee on Payment and Settlement Systems (“CPSS”). The renaming became effective as of 1 September 2014.

includes the participants and the entity operating the arrangement. Payment systems are commonly categorised into large-value payment systems (“LVPS”) and retail payment systems. An LVPS is a funds transfer system that settles large-value transactions between financial institutions. Retail payment systems are mostly large-volume low-value payments by and between individuals and corporations through instruments such as cheques, credit transfers, debit transfers, or payment cards.

- (b) *Central Securities Depositories (“CSD”)*: A central securities depository provides securities accounts, central safekeeping services, and asset services, which may include the administration of corporate actions and redemptions. A CSD can hold securities either in physical form (but immobilised) or in dematerialised form (that is, they exist only as electronic records).
- (c) *Securities Settlement Systems (“SSS”)*: A securities settlement system enables securities to be transferred and settled by book entry according to a set of predetermined multilateral rules.
- (d) *Central Counterparties (“CCP”)*: A central counterparty interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the performance of open contracts.
- (e) *Trade Repositories (“TR”)*: A trade repository is an entity that maintains a centralised electronic record/database of transaction data.

1.4 Prior to the issuance of the PFMI, MAS had applied CPSIPS, RSSS and RCCP in its supervision of relevant FMIs. In line with international developments, MAS now adopts the standards set out in the PFMI. All systemically important payment systems (“SIPS”), CSDs, SSSs, CCPs, and TRs in Singapore are expected to comply with the PFMI. In addition, MAS may impose higher or more specific requirements on FMIs, as appropriate, in the context of specific risks, or in the context of wider financial sector stability.

2 Supervisory Objectives

2.1 The *Monograph on Objectives and Principles of Financial Supervision* issued in 2004 sets out six distinct objectives of MAS' supervisory function:

- a stable financial system;
- safe and sound financial intermediaries;
- safe and efficient FMIs;
- fair, efficient and transparent organised markets;
- transparent and fair-dealing intermediaries and offerors; and
- well-informed and empowered consumers.

2.2 The objectives of ensuring safe and efficient FMIs, and fair, efficient and transparent organised markets, directly pertain to the supervision of FMIs. In particular, FMIs provide the services and facilities underpinning financial market activities, and are important nodes in the financial system. They thus play a critical role in the safety and efficiency of the financial system. MAS monitors and assesses relevant FMIs to ensure that they have proper structures, processes and rules in place to achieve the following objectives:

- (a) *Safety*: FMIs play a key role in fostering financial stability. The failure of FMIs may contribute to and exacerbate systemic crises, and threaten the stability of domestic and international financial markets, and the broader economy. A safe FMI identifies, assesses, and manages risks that arise within the FMI or through interdependencies with other participants. These risks include, but are not limited to, legal, credit, liquidity, general business, custody, investment and operational risks. MAS seeks to ensure that FMIs are designed and operated in a safe manner, so that they do not compromise financial stability.
- (b) *Efficiency*: MAS also seeks to ensure that FMIs operate in an efficient manner. Inefficient FMIs may distort financial activity and the market structure, affecting not only its participants, but participants' customers as well. These distortions may in turn lead to increased risks within the broader financial system. An efficient FMI makes effective use of resources in performing its duties, thereby keeping costs reasonable while maximising economic benefits.

3 Regulatory Framework

3.1 MAS' powers for the supervision of FMIs are derived from the Payment Systems (Oversight) Act ("PS(O)A") and the Securities and Futures Act ("SFA"). The PS(O)A and SFA set out the regulatory framework for FMIs, in line with the PFMI. MAS has primary responsibility for the supervision of SIPS, CSDs³, SSSs, CCPs and TRs in Singapore. A list of FMIs which MAS supervises is in Annex A.

Payment Systems

3.2 The PS(O)A empowers MAS to collect information from all payment systems in Singapore. Specifically, MAS has powers to require the provision of payment system-related information by the operators, settlement institutions or participants of any payment system in Singapore. The purpose of this requirement is to allow MAS access to comprehensive and reliable information. This enables MAS to monitor the development of the payment system industry in Singapore and make informed policy decisions.

3.3 In addition, the PS(O)A provides MAS with powers to regulate designated payment systems ("DPS"). MAS can designate a payment system if it is considered a SIPS or a system-wide important payment system ("SWIPS"), or where it is otherwise in the public interest to do so.

- (a) SIPS are systems whose disruption could trigger, cause or transmit further disruption to participants or cause systemic disruption to the financial system of Singapore. The MAS Electronic Payment System ("MEPS+") is a SIPS in Singapore. All SIPS are subject to the PFMI.
- (b) SWIPS are systems whose disruption could affect public confidence in payment systems or the financial system of Singapore. Although a disruption or failure in these systems may have system-wide implications and may affect many users, there is negligible risk of systemic impact to financial stability. The Singapore Dollar Cheque Clearing System ("SGDCCS"), US Dollar

³ There is currently only one commercial CSD in Singapore, operated by The Central Depository (Pte) Limited ("CDP"), which is also a CCP and SSS, the functions of which are regulated under the Securities and Futures Act. MAS administers the regulation of CDP as a CSD in accordance with the Companies Act.

Cheque Clearing System (“USDCCS”), Interbank GIRO System (“IBG system”) and NETS Electronic Fund Transfers at Point of Sale (“EFTPOS”) are considered SWIPS and have been designated under the PS(O)A. MAS does not subject SWIPS to the PFMI.

3.4 The criteria used to determine the need for designating payment systems for supervision include number and value of transactions processed, number and type of participants, markets served, market share, interconnectedness with other payment systems and other financial institutions, and available alternatives to using the payment system at short notice.

3.5 DPSs in Singapore are brought under MAS’ regulatory and supervisory ambit due to their impact on public confidence and the broader financial system of Singapore. MAS’ regulatory powers over DPSs include the ability to regulate access rules for participation, impose restrictions and conditions, establish standards, make regulations, approve and remove chief executive officers and directors, approve substantial shareholders and other controllers, issue directions and inspect DPSs’ operations.

3.6 Unlike other DPSs, MEPS+ is owned and operated by MAS. As the PS(O)A is designed for commercial DPSs, MAS is exempted from the PS(O)A⁴ as an operator, settlement institution and participant of MEPS+. To supervise MEPS+ effectively, internal arrangements and controls have been established within MAS to ensure adherence to the PFMI. These are elaborated under Section 4 of this monograph.

Capital Markets FMIs

3.7 As the statutory capital markets regulator, MAS is responsible for the supervision of capital markets FMIs (“CMFMI”) which comprise CSDs, SSSs, CCPs and TRs in Singapore. CMFMIs in Singapore have the potential to trigger or transmit systemic disruptions due to their critical functions in the Singapore capital markets and are therefore deemed to be systemically important.

⁴ The amendments to the PS(O)A to exempt MAS were passed in Parliament on 14 January 2013.

3.8 MAS' supervision of CMFMIs is guided by the SFA and its accompanying regulations. Any SSS, CCP or TR that seeks to offer its services in Singapore must be authorised⁵ by MAS before it can commence operations.

3.9 Pursuant to Part III of the SFA, clearing facilities are defined to include SSSs and CCPs. Corporations operating clearing facilities are regulated as approved clearing houses ("ACH") or recognised clearing houses ("RCH"). TRs are regulated as either licensed trade repositories ("LTR") or licensed foreign trade repositories ("LFTR") under Part IIA of the SFA.⁶

3.10 Generally, ACHs and LTRs are locally-incorporated FMIs subject to a higher degree of supervision in Singapore on account of their greater systemic importance. They are required to comply with a set of ongoing obligations in line with the PFMI, including obligations to operate safe and efficient facilities, manage business and operational risks prudently, and maintain sufficient financial, human and system resources. In addition, specific risk management frameworks are subject to MAS' direct supervision and review, for example, changes to business rules or, for ACHs, changes to financial resources that are available to support a member's default. In general, MAS' regulatory powers over ACH and LTRs include powers to impose restrictions (including access restrictions) conditions and directions, approve and remove chief executive officers and directors, approve substantial shareholders and other controllers, and conduct inspections of the operations.

3.11 RCHs include locally-incorporated clearing facilities which are not FMIs, i.e. do not carry out CSD, SSS or CCP functions, as well as overseas-incorporated clearing facilities which offer FMI functions in Singapore. LFTRs are overseas-incorporated FMIs which offer trade repository functions in Singapore. An overseas-incorporated FMI is regulated as RCH or LFTR, in recognition that MAS has been satisfied of the following:

⁵ "Authorised" means an admission process, which may be referred to as "approved", "recognised", "licensed" or words of such effect, in the legislation.

⁶ MAS issued a legislative consultation on 23 May 2012, to expand the scope of the Securities and Futures Act by introducing (i) a new licensing regime for trade repositories to be regulated as licensed trade repositories or licensed foreign trade repositories; and (ii) a new authorisation regime for all persons operating clearing facilities to be regulated as approved clearing houses or recognised clearing houses. The Securities and Futures (Amendment) Bill 2012, containing these legislative amendments, was passed in Parliament on 15 November 2012.

- (a) The regulatory regime in the home jurisdiction of the FMI is comparable, in the degree to which MAS' objectives of regulation are achieved, to the requirements and supervision to which a locally-incorporated FMI in Singapore is subject under the SFA. The home jurisdiction should be one which applies the PFMI in its supervision of the overseas-incorporated FMI; and
- (b) Adequate arrangements have been made for cooperation with the home regulator of the FMI, generally through a memorandum of understanding, or similar formal documentation, on information exchange and mutual assistance between MAS and the home regulator of the FMI.

3.12 RCHs and LFTRs are subject to a baseline level of general obligations in line with the PFMI. These include obligations to operate safe and efficient facilities, manage business and operational risks prudently, and maintain sufficient financial, human and system resources. However, in view that they are subject to supervision by their home regulators, MAS exercises a less intrusive approach towards supervision of such entities.

3.13 Similar to the PS(O)A, the SFA empowers MAS to collect information from ACHs, RCHs as well as LTRs and LFTRs. This allows MAS to monitor the activities of the FMIs, in order to assess the impact of their activities to the capital markets in Singapore.

3.14 Both the PS(O)A and the SFA are regularly reviewed and updated to ensure their continued effectiveness in supporting MAS' supervisory objectives with respect to FMIs.

4 Supervisory Approach

SIPS

4.1 MEPS+ is the only SIPS in Singapore and is owned and operated by MAS. Notwithstanding that MAS is exempted from the PS(O)A, MAS holds itself to similar standards as those expected of an operator and settlement institution of a DPS under the PS(O)A. To maintain effective oversight of MEPS+, MAS has established a formalised internal arrangement where the supervisory and operational functions are separate, with distinct reporting lines to different management fora. The supervision of MEPS+ is aimed at ensuring its safety and efficiency through adherence to the PFMI.

4.2 The Information Technology Department (“ITD”) in MAS is responsible for the operations of MEPS+. An independent risk management unit resides in the Risk Management Department (“RiMD”) to oversee the risk management of MEPS+. The Specialist Risk Department (“SRD”) in MAS is responsible for the supervision of MEPS+. SRD uses a combination of supervisory tools to oversee MEPS+. These tools include:

- (a) *Information gathering and analysis:* SRD collects a variety of reports and data to facilitate on-going monitoring and analysis of MEPS+ operations, developments and risks. On a quarterly basis, ITD submits a report on key MEPS+ payment statistics and events, such as industry testing and decisions made by management committees. The quarterly report allows SRD to maintain a good understanding of MEPS+, and to assess potential areas where risks may materialise. In addition, SRD collects and analyses transaction information on MEPS+ periodically to understand payment trends and to identify payment flow anomaly and any risk that may arise in the system. On an ad-hoc basis, ITD reports material incidents and notifies SRD prior to material changes to its operations. These ad-hoc submissions provide SRD with more timely information on significant developments and risks to MEPS+.
- (b) *On-site inspection:* In addition to desk top reviews and analyses, SRD carries out periodic inspections of MEPS+ operations and participants. Such inspections facilitate a more in-depth review of whether risks are appropriately managed, and whether relevant MAS notices and guidelines are adhered to.

- (c) *Assessment against PFMI:* ITD and RiMD conduct self-assessments of MEPS+ adherence to the PFMI, and are committed to publish information required under the PFMI Disclosure Framework (“DF”) biennially. SRD reviews the DF. SRD also performs ongoing risk assessment of MEPS+, using information gathered from both off-site and on-site reviews, to determine if supervisory action is needed to improve the safety or efficiency of MEPS+.
- (d) *Stakeholder engagement:* SRD will regularly engage ITD and RiMD to highlight for their timely action, any issues of supervisory concern. Where significant, issues will be escalated to the relevant management fora to ensure appropriate oversight and timely remediation. Internal audit is also kept apprised of such issues to facilitate their audit and risk assessment. Escalation to the MAS Board or relevant Board Committees may also take place where appropriate.

SWIPS

4.3 MAS’ supervisory framework for SWIPS similarly includes activities such as regular monitoring, meetings with senior management, inspection and assessment. Regular monitoring entails gathering information relating to the design and operation of DPS from the operator and settlement institution. Apart from the ongoing communications at staff level, MAS conducts regular meetings with senior management of the operator and settlement institution to discuss and understand the strategic plans of the DPS. Inspections and targeted examinations are carried out on a periodic basis. These supervisory activities focus on topics identified through monitoring as well as from previous inspections that either present higher risk or where control processes warrant validation. To facilitate the supervision of SWIPS, a risk assessment framework has been developed to assess the level of risks, and adequacy of controls of these payment systems.⁷ In addition, MAS collects information and data from these payment systems to analyse payment trends and to improve its understanding of the way these systems operate.

⁷ Please refer to the monograph on *MAS’ Framework for Impact and Risk Assessment of Financial Institutions*, issued in April 2007, available on the MAS website. This monograph covers how MAS’ supervisory objectives and principles shape our supervisory framework, and the supervisory processes that underpin the framework including how MAS assesses the impact of financial institutions and the use of the Common Risk Assessment Framework and Techniques (CRAFT) to assess their risks.

4.4 In addition, MAS engages the industry to monitor current issues and developments. Such surveillance and engagement with industry could form the basis for our payment systems policy formulation and regulations which MAS reviews from time to time.

CMFMIs

4.5 MAS supervises CMFMIs on an ongoing basis to ensure that they comply with their statutory obligations under the SFA. Similar to our supervision of DPS, MAS' supervisory framework for CMFMIs includes activities such as regular monitoring, meetings with senior management, self-assessments and inspection.

4.6 Regular monitoring entails the review of CMFMIs in various key areas such as financial and regulatory capital compliance, incidences of systems disruptions, and changes to business rules of CMFMIs, which govern the relationships between the CMFMIs and their respective participants. MAS also engages the CMFMIs in regular dialogue both at staff and senior management level. Self-assessments involve CMFMIs conducting and submitting a self-assessment report to describe how they have discharged their statutory responsibilities. As with DPS, a risk assessment framework has been developed to assess the level of risks, and adequacy of controls of these CMFMIs. Based on the risk assessment framework, on-site inspections are carried out on a periodic basis, focusing on areas identified through monitoring as well as from previous inspections.

5 FMI Subject to Cooperative Oversight

5.1 Where relevant and practical, MAS seeks to participate in the cooperative oversight of cross-border or multi-currency FMIs which may affect the stability of the financial system of Singapore. Cooperation may take a variety of forms, including formal arrangements that are organised under memoranda of understanding, protocols, informal ad hoc arrangements and regular communications. MAS recognises that cooperative oversight between authorities helps to foster consistent and transparent communications between authorities and the cross-border or multi-currency FMI, enhance transparency among the participating authorities and avoid subjecting the FMI to conflicting regulation. This approach is reflected in the design and administration of the PS(O)A and SFA. Please refer to Annex B for details of FMIs that are subject to cooperative oversight by MAS.

Financial Market Infrastructures Supervised by MAS⁸

1 Systemically Important Payment System

1.1 MEPS+⁹ is a real time gross settlement system for large-value SGD interbank funds transfers. It is the payment system used for financial market transactions, such as foreign exchange and securities transactions. It is also used to effect interbank payments arising from other financial market infrastructures (e.g. cheque and GIRO clearing, and Central Securities Depository). MEPS+ also processes the settlement and holding of scripless Singapore Government Securities¹⁰ (“SGS”) and MAS Bills¹¹. MEPS+ is designated under the Payment and Settlement Systems (Finality and Netting) Act (“FNA”) which provides the legal certainty that all transactions settled by MEPS+ are final and irrevocable.

2 System-Wide Important Payment Systems

Systems operated by the Singapore Automated Clearing House (“SACH Systems”)

2.1 The SGDCCS, USDCCS and IBG system, collectively called the SACH systems, are provided by the Singapore Automated Clearing House. These systems are operated by the Banking Computer Services Pte Ltd (“BCS”).

2.2 The SACH systems process mainly interbank retail payments. These retail transactions are lower in value compared to MEPS+ payments, but form a large volume of important business and retail transactions such as salary and bill payments. Obligations from financial transactions such as those arising from stock

⁸ As at January 2015.

⁹ As explained in paragraph 3.6 of this monograph, MAS is exempted from the PS(O)A as an operator, settlement institution and participant of MEPS+.

¹⁰ SGS are issued by MAS, in its capacity as the Singapore Government’s fiscal agent. SGS issuance is governed by the Government Securities Act and Local Treasury Bills Act.

¹¹ MAS Bills are issued by MAS pursuant to the MAS Act.

trading may also be settled through SACH systems. SACH clears transactions on a multilateral deferred net settlement basis. Actual funds settlement for IBG and SGD cheques take place in MEPS+ while for USD cheques, settlement occurs in the Cheque Settlement System operated by Citibank N.A., the appointed settlement bank for USDCCS. These systems are designated under the FNA to provide for the enforceability of netting arrangements under certain scenarios and to give certainty to the default arrangements of these systems in the event of the insolvency of a participant.

NETS Electronic Fund Transfers at Point of Sale (“EFTPOS”)

2.3 Debit cards are an important means of payment at points-of-sale (“POS”) for Singapore residents. NETS EFTPOS, a debit card system, is operated by Network for Electronic Transfers (Singapore) Pte Ltd. It has key linkages to customer deposits and the merchant base. Interbank settlement occurs on a deferred net basis.

3 Capital Markets FMIs

The Central Depository (Pte) Limited (“CDP”)

3.1 CDP is a CSD, SSS and CCP in respect of trades executed on the market operated by the Singapore Exchange Securities Trading Limited. This includes trades on shares, warrants and other securities¹². CDP is also a CSD and SSS in respect of the settlement of transactions in over-the-counter (“OTC”) bonds.

Singapore Exchange Derivatives Clearing Limited (“SGX-DC”)

3.2 SGX-DC is a CCP which provides clearing and settlement for futures and options contracts on interest rates, stock indices, dividend indices and commodities traded on the Singapore Exchange Derivatives Trading Ltd. SGX-DC also offers clearing of OTC commodity and financial derivatives, such as oil, coal swaps, freight forward agreements, interest rate swaps and non-deliverable foreign exchange forward contracts.

¹² These include real estate investment trusts (REITs), exchange-traded funds (ETFs), exchange-traded notes (ETNs), business trusts, American depository receipts (ADRs), global depository receipts (GDRs) as well as bonds.

ICE Clear Singapore Pte Ltd (“ICSG”)

3.3 ICSG provides clearing and settlement for futures listed on ICE Futures Singapore Pte Ltd (“IFSG”). Intercontinental Exchange, Inc. acquired Singapore Mercantile Exchange Pte Ltd and Singapore Mercantile Exchange Clearing Corporation Pte Ltd in February 2014, and renamed these entities as IFSG and ICSG, respectively.

DTCC Data Repository (Singapore) Pte. Ltd. (“DDRS”)

3.4 DDRS, a subsidiary of Depository Trust and Clearing Company in the US, operates a TR in Singapore. DDRS enables market participants’ reporting of OTC derivative transactions (e.g. credit default swaps, interest rate swaps). Information reported to DDRS provides regulators with enhanced transparency in the OTC market.

Financial Market Infrastructures Subject to Cooperative Oversight¹³

1 Continuous Linked Settlement

1.1 The Continuous Linked Settlement (“CLS”) is a global payment system that MAS oversees via a cooperative oversight arrangement. CLS is a cross-border payment system that settles foreign exchange transactions for the major currencies on a payment-vs-payment (“PVP”) basis. The settlement service is provided by CLS Bank in New York. It provides PVP settlement service across 17 currencies (including the Singapore Dollar), and non-PvP settlement of certain credit derivative and non-deliverable foreign exchange forward trades.

1.2 MAS participates in the cooperative oversight of CLS. CLS Bank is regulated and supervised by the Federal Reserve in the U.S. as an Edge corporation. The U.S. Federal Reserve also chairs the CLS Oversight Committee (“OC”), in which MAS participates along with other central banks. The CLS OC provides a mechanism for central banks whose currencies are settled in CLS Bank to carry out their individual oversight responsibilities. The U.S. Federal Reserve organises and administers the CLS OC, which operates in accordance with the Protocol for Cooperative Oversight of CLS (“Protocol”). The Protocol was adopted by the CLS OC to avoid duplication of effort by the central banks, foster consistent, transparent communications between the central banks and CLS Bank, and enhance transparency among the participating central banks regarding the development and implication of international and domestic policies applicable to CLS Bank. As a SIPS, CLS is required to comply with the PFMI by the CLS OC.

¹³ As at January 2015.