Hong Kong Monetary Authority
香港金融管理局

Supervisory Policy Manual		
TA-2	**Foreign Exchange Risk Management**	V.3 – 18.01.2022

This module should be read in conjunction with the Introduction and with the Glossary, which contains an explanation of abbreviations and other terms used in this Manual. If reading on-line, click on blue underlined headings to activate hyperlinks to the relevant module.

Purpose

To set out the approach which the HKMA will adopt in the supervision of foreign exchange risk and any associated settlement-related risks, and to provide guidance to AIs on the key elements of an effective risk management framework for such risks.

Classification

A non-statutory guideline issued by the MA as a guidance note.

Previous guidelines superseded

Guideline 7.1 "Supervision of foreign exchange risk" dated 31.05.90; TA-2 "Foreign Exchange Risk Management" V.1 dated 17.09.04 and V.2 dated 14.01.09

Application

To all AIs

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1. Introduction

1.1 Terminology

1.1.1 In this module,

- "financial market infrastructure" ("FMI") means 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;
- "foreign exchange risk" means the risk arising from movements in foreign exchange rates;
- "legal risk" means the risk of an unexpected application of a law or regulation;
- "liquidity risk", in the context of a foreign exchange settlement process, means the risk that an AI is unable to make payments due to a shortage of liquidity arising from a counterparty (or participant in a settlement system) not settling an obligation for full value when due. Liquidity risk can exist throughout the period between trade execution and final settlement;
- "operational risk" means the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. It includes legal risk;
- "payment-versus-payment settlement" ("PvP settlement") means a settlement mechanism that ensures the final transfer of a payment in one currency if, and only if, a final transfer of a payment in another currency occurs, thereby removing principal risk;
- "principal risk" means the risk of outright loss of the full value of a transaction resulting from a counterparty's failure to settle. This can arise from an AI having paid the currency being sold but failing to receive the currency being bought in a foreign exchange transaction (also known as "Herstatt

risk”). The principal risk exposure to a counterparty begins when an AI is no longer guaranteed that it can unilaterally cancel the payment of the currency it sold (the unilateral cancelation deadline) until the AI receives the bought currency with finality;

- “replacement cost risk” means the risk that a counterparty of an AI will default before a foreign exchange transaction is settled and consequently the AI must replace the original transaction with a new one with a different counterparty at (potentially less favourable) current market prices. This risk exists throughout the period between trade execution and final settlement; and
- “settlement-related risks” means the risks associated with the settlement of foreign exchange transactions, which may include principal risk, replacement cost risk, liquidity risk, operational risk and legal risk.

1.2 Background

1.2.1 AIs have foreign exchange positions which generally arise from the following activities:

- trading in foreign currencies through spot, forward and option transactions as a market maker or position taker, including the unhedged positions arising from customer-driven foreign exchange transactions;
- holding foreign currency positions in the banking book (e.g. in the form of loans, bonds, deposits or cross-border investments); or
- engaging in derivatives transactions (e.g. structured notes, synthetic investments and structured deposits) that are denominated in foreign currency for trading, investment or hedging purposes.

1.2.2 Foreign exchange risk thus applies to positions in both the trading book and the banking book.

1.2.3 Excessive foreign exchange risk and the associated settlement-related risks can pose a significant threat to

AIs' earnings, liquidity and/or capital adequacy positions. AIs should therefore address the risk arising from foreign exchange operations and exposures by:

- maintaining an effective risk management system to identify, measure, monitor and control the extent and nature of the risks;
- setting appropriate limits on such risk exposures to avoid risk concentration; and
- (in respect of locally incorporated AIs) holding adequate capital against the possibility of loss. The capital requirements for foreign exchange risk exposures and the counterparty credit risk associated with the settlement of foreign exchange transactions are set out respectively in the market risk capital framework and the counterparty credit risk framework of the Banking (Capital) Rules ("BCR")[1]. The Pillar 2 requirements of the Basel Committee ("BCBS"), which cater to risks not covered, or not adequately covered, by Pillar 1 requirements, are set out in CA-G-5, "Supervisory Review Process".

1.2.4 AIs should also be aware of the potential impact of interrelationships between foreign exchange risk and other risks on their portfolios. For example, adverse changes in exchange rates and interest rates are usually correlated under adverse market conditions and may increase the counterparty credit (or settlement) risk of individual market participants.

1.2.5 Maturity mismatches between foreign currency positions constitute a source of liquidity risk to AIs. If an AI has an overnight short position and an equivalent one-year long position in the same foreign currency, a matched foreign exchange position is reflected. This position however creates a maturity mismatch (i.e. maturity gap). Detailed requirements relating to foreign currency maturity

[1] The capital requirements are highlighted in CA-G-1 "Overview of Capital Adequacy Regime for Locally Incorporated Authorized Institutions".

mismatches are set out in LM-2 "Sound Systems and Controls for Liquidity Risk Management".

1.2.6 The supervisory approach to foreign exchange risk set out in this module is based on the principles and practices expounded in various documents issued by the BCBS, including its document, "Supervisory guidance for managing risks associated with the settlement of foreign exchange transactions" issued in 2013 ("BCBS FX Guidance")[2].

1.3 Scope

1.3.1 This module:

- provides guidance on measures and best practices for the effective management of foreign exchange risk (including any associated settlement-related risks and indirect foreign exchange risk of borrowers);
- aims to help AIs evaluate the adequacy and effectiveness of their foreign exchange risk management; and
- sets out how the HKMA monitors and supervises AIs' level and management of foreign exchange risk.

1.3.2 This module should be read in conjunction with IC-1 "Risk Management Framework", CG-1 "Corporate Governance of Locally Incorporated Authorized Institutions", CR-G-13 "Counterparty Credit Risk Management" and IC-5 "Stress-testing". The governance and risk management criteria and sound practices contained in these documents are also applicable to the effective management of foreign exchange risk and associated settlement-related risks.

1.3.3 In respect of the management of foreign exchange risk in options and other derivatives, see Guideline 12.2 "Risk Management of Derivatives and Other Traded Instruments" for a more detailed description of the relevant sound practices.

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[2] https://www.bis.org/publ/bcbs241.pdf.

1.4 Implementation

1.4.1 The requirements in this module apply to AIs on a proportionate basis. AIs are expected to put in place the necessary risk management framework (including policies and procedures, systems, limits and relevant controls) to manage foreign exchange risk and settlement-related risks that are commensurate with the nature, scale and complexity of the AIs' foreign exchange activities and exposures.

1.4.2 AIs should assess their risk management framework against the additional requirements of this revised module, which mainly relate to the update of the BCBS FX Guidance on settlement-related risks, and devise an action plan to address any gaps identified within a reasonable period of time. The start of full compliance should be commensurate with AIs' exposures to foreign exchange settlement-related risks but not be reached later than 18 January 2023 unless an extension has been specifically agreed with the HKMA.[3] The HKMA will monitor the progress of AIs in meeting the relevant standards in the course of its ongoing supervision.

2. Classification of foreign exchange risk exposures

2.1 Structural versus trading[4]

2.1.1 Foreign exchange risk exposures can be divided broadly into two categories: structural and trading. Structural exposures typically arise because of structural imbalances between assets and liabilities (see para. 2.1.2 below); these exposures do not normally change rapidly. Exposures other than structural are generally regarded as trading. These exposures may arise

[3] AIs asking for such an extension should provide justification to support their request.

[4] Structural exposures as specified in this module are not necessarily qualified as structural positions under section 295(3) of the Banking (Capital) Rules. Where an AI has maintained structural positions for regulatory capital purposes, it should not exclude any of such structural positions from the calculation of the market risk capital charge for its foreign exchange exposures without previous consultation with the HKMA. In the context of the BCR, "structural position" means a foreign exchange position held by an AI with the intention of hedging itself against adverse effects of exchange rate movements on its capital adequacy ratio.

because of business needs, customer transactions that cannot be covered immediately, or because a view is taken on currency movements. As trading exposures arise and change rapidly, they can usually only be restricted within prescribed trading limits.

2.1.2 Structural exposures in foreign currency include those arising from:

- investment in fixed assets and premises;
- equity investment in overseas subsidiaries and related companies;
- "endowment" capital in overseas branches;
- issue of capital instruments such as subordinated debt and preference shares; and
- booking of unremitted profits or remittance of profits from overseas branches.

Other examples may arise, such as positions resulting from an entrenched imbalance between the currency denomination of banking assets and liabilities, or because capital is in a different currency to assets.

2.1.3 For any investment that creates a structural position, an AI's management will have taken a conscious and carefully considered decision not to hedge the investment, because it may be impractical or inappropriate to fund the investment in the currency in which it is denominated.

2.1.4 AIs should provide the HKMA with information on how their structural positions are defined and managed. The HKMA will review whether there is sufficient justification to exclude the "structural positions" defined by an AI from its foreign exchange limits (see para. 3.3.3 below). If the HKMA considers that any part of the structural positions of an AI is not clear-cut, the HKMA may ask the AI concerned to subject the "structural positions" in question to trading limits and/or capital charge.

2.1.5 Once set by an AI's management, a structural position should not normally be changed without sound justification (save for fluctuations or movements arising from ordinary business operations). It must not be used for trading or profit-taking purposes. AIs should therefore promptly notify the HKMA of any significant changes in their structural positions and the reasons behind the changes. Where an AI anticipates a change in its structural positions due to factors other than those cited in para. 2.1.2 above (e.g. a change in the hedging strategy for such positions), the HKMA would expect to be consulted in advance.

2.1.6 The HKMA expects the structural positions of a banking group (i.e. the parent bank and its subsidiaries) to be managed on a consolidated basis.

2.2 USD exposure

2.2.1 Under the linked exchange rate system for the Hong Kong dollar, arbitrage in the foreign exchange market ensures that the HKD exchange rate remains stable within a band of HKD 7.75 to 7.85 per USD[5]. While the volatility of USD/HKD positions has been relatively low, AIs should set internal limits on such positions maintained for their trading activities to control the risk of concentration on individual currencies. For the purpose of supervisory monitoring, the HKMA will take into account such positions in its ongoing review of individual AIs' overall foreign currency positions (see subsection 3.3).

2.3 Gold exposure

2.3.1 If gold exposures are treated as foreign exchange risk in the approach an AI uses for the calculation of its market risk capital charge, they should be included in the calculation of the AI's foreign currency position.

[5] https://www.hkma.gov.hk/eng/key-functions/money/linked-exchange-rate-system/.

3. Supervisory approach to foreign exchange risk

3.1 Objectives and process

3.1.1 Foreign exchange risk is included under market risk, one of the eight major types of risks covered under the HKMA's risk-based supervisory approach. Continuous supervision of AIs' foreign exchange risk will be achieved through a combination of on-site examinations, off-site reviews and prudential meetings. The objective is to assess the adequacy and effectiveness of an AI's foreign exchange risk management process, the level and trend of the AI's risk exposure and, in the case of a locally incorporated AI, the adequacy of its capital relative to the size of its exposure. See SA-1 "Risk-based Supervisory Approach" for details of the HKMA's risk-based supervisory methodology, and IC-1 "Risk Management Framework" as well as CA-G-5 "Supervisory Review Process" for details of the HKMA's frameworks for assessing the AIs' general risk management framework and adequacy of locally incorporated AIs' capital to cater for risks that are not covered or adequately covered under the BCR.

3.1.2 The HKMA's expectations regarding AIs' management of foreign exchange settlement-related risks and foreign exchange exposures of borrowers are discussed respectively in sections 6 and 7 below.

3.2 Factors to be considered

3.2.1 In assessing the effectiveness of an AI's foreign exchange risk management, the HKMA will primarily take into consideration the following:

- the nature, complexity and level of foreign exchange risk arising from the AI's foreign exchange activities and positions;
- the adequacy of the AI's foreign exchange risk management framework, including the level of oversight exercised by the Board and senior management and the propriety of its management and reporting systems;

- management's knowledge and ability to identify and manage sources of foreign exchange risk;
- the adequacy of, and compliance with, foreign exchange risk management policies and procedures;
- the adequacy and effectiveness of internal limits set on foreign exchange risk exposures;
- the adequacy of the AI's independent risk management, compliance and internal audit functions in relation to its foreign exchange risk management process; and
- the appropriateness of the AI's level of foreign exchange risk in relation to its earnings, capital, liquidity and risk management systems.

3.3 Monitoring of foreign exchange risk

3.3.1 The HKMA reviews the level and trend of AIs' foreign exchange risk exposures based on a number of supervisory sources, including the monthly Return of Foreign Currency Position – MA(BS)6 ("Foreign Currency Position Return"). The Return collects information on the amount of net long (short) position in each currency and gold. The overall net open position is measured by aggregating the sum of net long/short positions in individual currencies. Separately, the Return collects information on the structural positions of an AI.

3.3.2 In reporting the open position in individual currencies, AIs should take account of assets and liabilities in that currency (except those structural positions mentioned in subsection 2.1 above), unmatured spot and forward deals, futures contracts and options.[6]

3.3.3 AIs are expected to set their own internal limits on open positions (excluding structural positions) in each individual currency and on the aggregate overnight open position for all foreign currencies, and to notify the HKMA of their present, or proposed, overnight limits (at the

[6] The positions include those in both the banking book and trading book.

institution-wide level only). The HKMA will consider whether the limits are reasonable and necessary, having regard to the AIs' funding and business strategies. It is important that the limits set by AIs should be realistic and should not be set at a level that is out of line with their scale of business, risk tolerance policy and degree of market proficiency. See also subsection 5.5 which provides other relevant factors that should be considered in the setting of internal limits. The HKMA will review AIs' internal limits as part of its ongoing supervision.

3.3.4 In the case of locally incorporated AIs, the HKMA will pay particular attention to those with relatively large aggregate open position limits (say, higher than 25% of their capital base), which may reflect a concentration of foreign exchange risk. They will be required to provide adequate justification for setting such limits. Depending on the circumstances of each case, the AI may be asked to reduce its limit, strengthen its capital position and may be subject to greater scrutiny and review, including additional reporting requirements for its foreign exchange risk exposures. This does not, however, mean that the HKMA will not allow AIs to maintain higher limits due to business needs or other justifications.

3.3.5 In determining whether it is acceptable for an AI to maintain higher open position limits, the HKMA will have primary regard to the level of risk incurred by the AI and its ability to withstand the risk. Consideration will also be given to the nature of the AI's operations and other business factors, such as the need to accommodate a larger volume of customer transactions or other core operations. However, where such higher limits are used solely for trading or short-term risk-taking activities, supervisory concern may be raised.

3.3.6 Regarding the Hong Kong branches of AIs incorporated outside Hong Kong, it is the responsibility of their overseas head offices and home supervisory authorities to monitor their foreign exchange position limits centrally. In order to ensure that such branches maintain well-run operations, however, they should inform the HKMA of the details of their internal limits at the branch level. The HKMA will assess the expertise of any branch which has an aggregate overnight limit that appears large, say, in excess of 5%, in relation to the capital base of the AI as a whole.

3.3.7 AIs should observe their internal limits in the normal course of operations. On occasion they may be exceeded. A large excess, or an emerging pattern of excesses, would prompt a request for an explanation. The "exception report" mentioned under para. 3.3.9 below provides for this purpose.

3.3.8 The reporting arrangements may give rise to a number of practical problems. These include the definition of "overnight" and how limits are applied where there are subsidiaries and overseas branches. The HKMA's approach will be pragmatic. As far as possible it will rely on the consistently applied practices and systems developed by the AI designed to give general effect to the concepts. For example, "overnight" will be taken to be measured at the point when an AI closes its books for a day's transactions, if that is how the AI finds it most appropriate to monitor its limits.

3.3.9 In order to enable compliance with an AI's internal limits to be monitored, each AI is required to complete an "exception report" in the Foreign Currency Position Return to the HKMA. This shows the occasions when an AI's internal limits were exceeded during the reporting month. When exceptions are frequent or large, AIs will be asked for an explanation. In the case of the Hong Kong branch of an overseas bank whose own limits have been exceeded, the HKMA will share this with the overseas head office or home supervisory authority if there are special concerns.

3.4 Review of capital adequacy

3.4.1 Capital has an important role to play in mitigating and absorbing the risk of loss from foreign exchange activities of AIs. As part of sound risk management processes, locally incorporated AIs should analyse and incorporate the level of foreign exchange risk and the associated settlement-related risks (including principal risk and replacement cost risk) they undertake into their internal capital adequacy assessment process. Where AIs' business involves taking significant risks associated with their foreign exchange activities[7], they should also place emphasis on the use of stress-testing techniques to evaluate the adequacy of capital to support the risks (see subsection 5.6 below).

3.4.2 The HKMA expects locally incorporated AIs to maintain adequate capital for the risks, including foreign exchange-related risks, they undertake and to incorporate these risks into their internal capital adequacy assessment processes. Where the HKMA assesses the foreign exchange risk and/or the associated settlement-related risks of a locally incorporated AI have not been adequately addressed under the capital requirements of the BCR applicable to the AI, the HKMA may increase capital requirements of the AI under the supervisory review process (see CA-G-5 "Supervisory Review Process").

3.5 Criteria for adequate internal systems

3.5.1 The HKMA will assess whether an AI has adequate governance and internal systems for managing foreign exchange risk and settlement-related risks in a safe and sound manner, taking into consideration the size, nature, complexity and risk profile of the AI's activities. The relevant criteria are set out in sections 4 to 7 below. The systems should be integrated into the AI's daily risk management practices and the output should be used in reporting the level of foreign exchange risk exposures to the Board and senior management and, where appropriate, individual business line managers.

3.5.2 The HKMA will require AIs to bring their governance and internal management systems up to standard if deficiencies are identified. Until the HKMA is satisfied that an AI's systems are adequate, it may require the AI concerned to supply additional information and to keep

[7] AIs should assess the level of significance of their foreign exchange risk and associated settlement-related risks (in relation to profitability and capital base) based on their own measures of market risk and counterparty credit risk under the BCR (also see CA-G-1 "Overview of Capital Adequacy Regime for Locally Incorporated Authorized Institutions").

its foreign exchange exposures within more conservative limits.

4. Oversight by AIs

4.1 Responsibilities of Board and senior management

4.1.1 Effective oversight by an AI's Board and senior management is critical for sound foreign exchange risk management practices. See CG-1 "Corporate Governance of Locally Incorporated Authorized Institutions" and IC-1 "Risk Management Framework" for details of their risk management responsibilities. Many of the requirements and practices cited have a general application.

4.1.2 The board of directors is ultimately responsible for ensuring that an AI has strong governance and risk management frameworks to properly identify, measure, monitor and control foreign exchange risk and the associated settlement-related risks. This includes approving and overseeing the AI's strategic objectives, risk appetite and corporate governance structure, and ensuring that management's actions to monitor and control foreign exchange risk and settlement-related risks are consistent with the risk appetite, strategy and policies approved by the board. AIs may, however, delegate the oversight of certain areas in relation to their foreign exchange and settlement-related risk management to specialised committees of the board.

4.1.3 AIs with significant foreign exchange operations should consider bringing in independent directors who have a strong experience in the management of complex capital market and trading operations. This would help strengthen the risk management role of the Board.

4.1.4 The Board and senior management should be promptly advised of any large losses arising from foreign exchange risk and/or associated settlement-related risks (or any possibility of such losses).

4.2 Independent risk management

4.2.1 The Board or senior management should assign responsibility for managing foreign exchange risk to individuals or units with appropriate experience and expertise. The responsible personnel should have a good understanding of all sources of foreign exchange risk and associated settlement-related risks faced throughout the AI.

4.2.2 There should be adequate segregation of duties in the key elements of the risk management process to avoid potential conflicts of interest. This is to ensure independent assessment of an AI's foreign exchange operations. Detailed requirements in this area are set out in subsection 5.4 below.

4.3 Staff competence

4.3.1 AIs should ensure that the staff involved in their foreign exchange operations have the necessary knowledge and expertise to undertake their duties. In this regard, AIs are encouraged to adopt the Enhanced Competency Framework[8] on Treasury Management ("ECF-TM")[9] (also see CG-6 "Competence and Ethical Behaviour") as a benchmark for enhancing the level of professional competence of treasury management practitioners, and support their staff to attend relevant training and examinations (such as those organised by the Treasury Markets Association ("TMA") or other similar accredited parties). In addition, AIs should consider a combination of important factors, e.g. experience and relevant professional qualifications, when recruiting employees for their treasury market activities.

8 See https://www.hkma.gov.hk/eng/key-functions/international-financial-centre/soft-infrastructure/enhanced-competency-framework/.

9 Details of the application of the ECF-TM are set out in the Guide attached to the HKMA circular of 23 November 2017 (https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2017/20171123e1.pdf).

5. Foreign exchange operations

5.1 General

5.1.1 AIs' risk management frameworks for foreign exchange risk and settlement-related risks should cover the general criteria set out in IC-1 "Risk Management Framework" and other criteria specific to foreign exchange transactions as discussed in the following subsections and section 6.

5.1.2 The foreign exchange risk management framework of AIs should be comprehensive and able to cover not only foreign exchange risk but all other material risks inherent to the life cycle of a foreign exchange transaction including principal risk, replacement cost risk, liquidity risk, operational risk and legal risk, having regard to the size, nature, complexity and risk profile of the AIs' foreign exchange activities, and be integrated into the AI's overall risk management framework.

5.1.3 The policies, procedures and limits should be properly documented, drawn up after careful consideration of the risks associated with different types of products, reviewed and approved periodically by the Board and/or senior management at the appropriate level, and circulated to all relevant departments and units.

5.1.4 It is important to supplement such policies and procedures with ethical rules and standards which employees engaged in foreign exchange trading activities should observe. These rules and standards should address issues concerning potentially problematic trading practices, such as trading at illiquid hours, spreading of rumours and false information. Minimum requirements on staff conduct and ethical behaviour such as control over personal investments, use of information and the acceptance of gifts are set out in CG-3 "Code of Conduct" and CG-6 "Competence and Ethical Behaviour" respectively.

5.1.5 The HKMA also strongly encourages AIs to observe the FX Global Code.[10] The Code is a set of global principles of good practice in the foreign exchange market, jointly developed by central banks and market participants around the globe (the HKMA and the TMA included) to provide a common set of guidelines promoting the integrity and effective functioning of the wholesale foreign exchange market.

5.2 New services and strategies

5.2.1 AIs should identify the foreign exchange risk and any settlement-related risks inherent in new services and activities and ensure that these are subject to adequate procedures and controls before being introduced or undertaken. Analysis that weighs the risks against potential returns and the organisational goals is also necessary.

5.2.2 AIs should pay special attention to new products and strategies that are apparently not compatible or associated with their core business activities. For example, a small retail bank's plan to engage in complex foreign exchange options trading may not fit in well with its risk profile and expertise. Such activities may carry non-conventional risks and require substantial system changes and implementation costs to accommodate them. New activities should not be launched until the required systems are in place.

5.2.3 New hedging or risk management initiatives (e.g. use of options for hedging) that are not already covered by an AI's foreign exchange policies should be approved in advance by the Board or a committee.

5.3 Risk measurement and reporting systems

5.3.1 AIs should have foreign exchange risk measurement systems that encompass all significant causes of such risks. The systems should evaluate the effect of foreign

[10] See https://www.globalfxc.org/fx_global_code.htm for the Code. For adoption of the Code in Hong Kong see HKMA circular dated 17 December 2021 (https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2021/20211217e1.pdf).

exchange rate changes on profitability and capital adequacy meaningfully and accurately within the context and complexity of their foreign exchange activities.

5.3.2 Measurement systems should:

- evaluate all foreign exchange risk by maturity, on both a gross and net basis, arising from the full range of an AI's assets, liabilities and off-balance sheet positions, including instruments with embedded or explicit foreign exchange options;
- employ generally accepted financial models or methods for measuring risk of foreign exchange options;
- be able to calculate comprehensive risk factor sensitivities (e.g. vegas by tenor) for the purpose of capturing the non-linear nature of price risk of options-related positions;
- have accurate and timely data (in relation to rates, embedded options and other details) on current positions[11];
- enable AIs to identify and measure accurately their foreign exchange settlement-related risks incurred both intraday and overnight (see para. 6.2.7), and monitor settlement exposures in real-time (or close to real-time) in order to ensure that settlement limits will not be exceeded (see subsection 5.5); and
- document the assumptions, parameters and limitations on which the measurement systems are based. Material changes to assumptions should be documented, well supported and approved by senior management.

5.3.3 Locally incorporated AIs which use an internal models approach to measure aggregate foreign exchange risk should meet the relevant requirements set out in the

[11] Any manual adjustments to underlying data should be clearly documented and the nature and reasons for the adjustments should be clearly understood.

BCR and CA-G-3 "Use of Internal Models Approach to Calculate Market Risk".

5.3.4 The experiences of past financial crises show that the volatility of some foreign currencies and counterparty credit risk could increase suddenly and in an extraordinary manner because of severe shocks in the foreign exchange market. The high volatility, the extent of contagion effects and the speed with which some markets could become illiquid have surprised many market participants. Under such conditions, some methodologies for measuring the potential foreign exchange exposures, e.g. value-at-risk, may lag behind and underestimate the movements in foreign exchange rates and the impact of counterparty credit risk in a stressed market environment.

5.3.5 Where AIs have material exposures to currencies with low historical volatility, particularly in emerging markets, they should conduct stress tests on those exposures to measure foreign exchange risk (also see subsection 5.6 on stress-testing below). In setting the limits of those exposures, AIs should have regard to the stress-testing results and should not rely solely on the historical volatilities of the currencies or the observed correlations among market risk factors.

5.3.6 There should also be an accurate, informative and timely management information system ("MIS") for foreign exchange risk and the associated settlement-related risks. This is essential both to keep the Board and/or senior management and, where appropriate, individual business line managers, well informed and to facilitate compliance with Board policy.

5.3.7 The MIS reports should include key risk indicators relating to foreign exchange activities. For example, for the purpose of market risk monitoring, senior management should receive independent daily reports of risk positions and traders' profit and loss. Repeated sharp movements in individual traders' profit and loss warrant close attention and remedial actions, if necessary. As for the monitoring of operational risk, indicators such as the number and ageing of unconfirmed transactions and unreconciled accounts should be reviewed and followed up. Increases in these indicators may reflect poor operational controls.

5.4 Risk monitoring and control of foreign exchange activities

5.4.1 The high level of risks commonly associated with foreign exchange trading (in particular proprietary trading) deserves close monitoring by AIs regardless of the size of operations. In particular, senior management should understand fully the risks involved. The operations should be in line with the AI's core business strategy and should justify the costs for controlling such operations.

5.4.2 To support such operations, there should be adequate capital, qualified people and suitably designed reporting and monitoring systems. It is also more appropriate for trading to be performed in a team environment, as this will discourage any unauthorised or unethical activity.

5.4.3 There should be effective segregation of duties between trading, risk measurement and monitoring, settlement and accounting functions. The front office (or the trading room) and the middle/back office (comprising a single department or multiple units responsible for financial control, risk management, settlement and accounting, etc.) functions should be separated physically. Staff in these functions should clearly understand their roles, responsibilities and reporting obligations. Access to the trading room should be restricted to authorised personnel only. In addition, undue influence of the front office staff on the middle/back office operations should be prevented.

5.4.4 A comprehensive framework of limits to control foreign exchange risk and the associated settlement-related risk exposures should be established for different levels of seniority, both for management and traders (see subsection 5.5 below for more details).

5.4.5 Dealing transactions in the trading room should be time-stamped and, for dealings made by telephone, voice-recorded. Use of wireless communication devices (such as mobile phones) for official business in the trading room should generally be discouraged. Where the use of such devices is allowed by AIs on an exceptional basis, they should have a clear written policy specifying the circumstances under which the use of such devices can be authorised by management.

5.4.6 Trading positions should be determined and monitored frequently by the middle office, with timely reporting to management throughout the trading day. Management should also be kept apprised of the potential for losses if market prices were to move unexpectedly.

5.4.7 Prior approval of senior management for transactions in excess of delegated trading limits must be obtained.

5.4.8 The middle office should reconcile regularly positions of traders to ensure that these are within assigned limits. Internal reports comparing actual positions against internal limits should be routinely prepared for management.

5.4.9 The middle office should revalue traders' positions regularly, with independent verification of revaluation rates and yield curves, for risk management and accounting purposes. To prevent manipulation, operating systems should have direct market data feeds, instead of routing through traders' terminals.

5.4.10 The back office should confirm all dealing transactions promptly with the counterparties. To ensure data integrity, the back office should secure an independent source of client and counterparty data. On an annual basis, all counterparties' open transactions should preferably be confirmed once.

5.4.11 Any irregularities in transactions, such as a large number of offsetting transactions, identified by the middle/back office should be reported promptly to senior management and investigated.

5.4.12 Generally, all transactions should be executed at current market rates. Off-market or historical rate rollover transactions should not normally be permitted, as these transactions may be used to hide a loss or extend a profit or loss position. Any such transactions should be subject to prior approval and stringent monitoring procedures.

5.4.13 AIs engaging in foreign exchange options trading should ensure that the traders and middle/back office staff have the necessary competence and expertise (also see subsection 4.3) for such activities. In addition, operational control for options trading can be strengthened if the middle/back office conducts independent review of the options positions. For example, the middle/back office may review all expired options and seek explanations for unusual observations, e.g. in-the-money options not being exercised or a large number of offsetting transactions.

5.4.14 Compensation for traders should be in line with the market. Such arrangements should be carefully designed to avoid giving incentives to traders for taking excessive risk in the short run, and be aligned with the AI's overall risk appetite and approved tolerance level. Trading performance in terms of the amount of profits earned should not be the sole factor for determining annual compensation. AIs may refer to CG-5, "Guideline on a Sound Remuneration System", for more detailed guidance.

5.4.15 The uninterrupted leave policy should be strictly enforced. During the leave period, traders on leave should be strictly barred from trading and any remote access rights.[12] After-hours or off-premises dealing should be restricted to specially designated traders only and be closely monitored.

5.5 Limits

5.5.1 AIs' foreign exchange open positions (i.e. excluding structural positions mentioned in subsection 2.1 above) should be subject to a hierarchy of internal limits (also see subsection 3.3). Limits including institution- wide and trading limits should be established for differing levels of seniority, both for management and traders. The limits should be reviewed at least annually or whenever the

[12] However, squaring of their trading positions either to take profit or to stop loss at the predetermined price level is allowed.

volatility of some currencies increases suddenly and in an extraordinary manner.

5.5.2 The size of limits will vary among AIs given their individual circumstances. These circumstances include crucial factors like the AI's expertise and the integrity of its risk management and trading systems. Given that such limits are a means of containing the risk of loss, the key limits for a locally incorporated AI should capture exposures on a consolidated basis, i.e. including the AI's branches and banking subsidiaries, here and abroad.

5.5.3 The following internal limits are recommended for foreign exchange activities:

- open position limits for individual currencies to which AIs have material exposures, both intraday and overnight. Where limits are assigned to a group of currencies, the corresponding risk measures should be aggregated on a gross basis;
- open position limits on the aggregate of all currencies, both intraday and overnight;
- open position limits by each centre where the AI operates;
- stop loss and/or management-action-trigger limits;
- option limits (e.g. delta, gamma, vega, and rho)[13]; and
- limits for settlement-related risks of all counterparties (see CR-G-13 "Counterparty Credit Risk Management" and subsection 6.2 below).

5.6 Stress-testing

5.6.1 AIs should measure their vulnerability to loss arising from their foreign exchange operations and liquidity squeeze under stressed market conditions. They should evaluate their capacity to withstand stressed situations in terms of profitability, liquidity and capital adequacy.

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[13] Details of option limits are covered in Guideline 12.2 "Risk Management of Derivatives and Other Traded Instruments".

This subsection should be read in conjunction with IC-5 "Stress-testing" that provides guidance on the use of stress tests for risk management purposes.

5.6.2 At a minimum, the stress tests should cover major currencies to which AIs are exposed. The effects of large exchange rate movements, including a sharp reduction in liquidity, of individual currencies should be considered when setting stress scenarios. The stress scenarios should be commensurate with the nature of AIs' portfolios and risks involved. AIs should take into account the stress-testing results when evaluating their adequacy of capital and liquidity and reviewing their business strategies, policies and limits for foreign exchange risk.

5.6.3 Stress scenarios need to shed light on the impact of adverse events on foreign exchange positions that display both linear and non-linear price characteristics (i.e. options and instruments that have options-like characteristics).

5.6.4 Possible stress scenarios include:

- historical scenarios such as the Asian Financial Crisis of 1997 and the Global Financial Crisis of 2007–2009;
- unanticipated foreign exchange or capital controls in some countries;
- abrupt depreciation or appreciation of individual currencies;
- exchange rate fluctuations due to downgrades of some countries' sovereign ratings;
- changes in key business assumptions and parameters such as the correlations among currencies;
- default of long-term assets denominated in foreign currencies; and
- delay or disruption to settlement systems.

5.7 Internal controls and independent audits

5.7.1 AIs should conduct periodic reviews of their internal control and risk management process for foreign exchange risk, including the associated settlement-related risks, to ensure its integrity, adequacy and reasonableness. Such reviews should be conducted by independent parties, e.g. internal or external auditors that are qualified to do so.

5.7.2 The reviews should, among other things, ensure:

- adequacy of relevant risk management systems and processes;
- compliance with established policies, procedures, limits and regulatory requirements applicable to the AI;
- accuracy and completeness of recording of all transactions and the risk exposures engendered;
- effective segregation of duties between front, middle and back office operations;
- effectiveness and accuracy of reporting of excesses of limits and other exceptions;
- adequacy in the validation, review and approval process for the use of models, methodologies, arrangements and data sources for measuring, controlling and mitigating foreign exchange risk exposures including the associated settlement-related exposures; and
- the integrity of the management information system.

5.7.3 Particular attention should be drawn to irregularities in profit and loss, abnormal trading patterns or trends (e.g. unusually large gross positions) and frequent excesses of limits. Internal auditors should ensure that such incidents are properly followed through. Any issues concerning controls in the trading area should be appropriately elevated to senior management in a timely manner.

5.7.4 AIs should promptly respond to findings regarding any violations of established procedures and ensure that there are rigorous procedures for addressing fully suggestions or queries made by risk control units, internal or external auditors and supervisory authorities.

5.7.5 Internal auditors and other risk control units should be adequately staffed and have sufficient expertise and authority for reviewing the trading business.

6. Foreign exchange settlement-related risks

6.1 General

6.1.1 The settlement of foreign exchange transactions may involve different types of risks. For example, if a transaction fails to settle, an AI may face the possibility of losing the full principal value of the transaction. The unsettled funds may also expose the AI to liquidity pressures if such funds are needed to meet other obligations. Settlement-related risks exist for any traded product but the size of the foreign exchange market makes foreign exchange transactions generally the greatest source of settlement-related risks for AIs.

6.1.2 Foreign exchange settlement failures can arise from counterparty default, operational problems, market liquidity constraints and other factors articulating as various types of shock scenarios.

6.1.3 The following types of risks may arise from the settlement of foreign exchange transactions[14]:

- principal risk;
- replacement cost risk;
- liquidity risk;
- operational risk; and
- legal risk.

6.1.4 AIs should ensure that foreign exchange settlement-related risks are effectively identified, measured, monitored and controlled.

[14] See the Annex to the BCBS FX Guidance for more information on these risks and how they arise.

6.1.5 The governance and risk management frameworks employed by AIs for this purpose should be based on the principle that the settlement-related risks are managed in a way that is similar to the management of equivalent risks of similar size and duration from their other activities, while taking into account the specific features of foreign exchange transactions as well as with the size, nature, complexity and risk profiles of the AIs' foreign exchange activities.

6.2 Risks relating to counterparty failure to deliver the expected currency

6.2.1 The three main types of risks associated with the settlement of foreign exchange transactions are principal risk, replacement cost risk and liquidity risk, which arise due to the possibility that a counterparty may fail to settle a foreign exchange transaction. An AI is exposed to these risks until it receives the bought currency with finality (i.e. the AI has confirmed receipt of the expected settlement payment and reconciled the receipt of funds in its account).

6.2.2 An AI should reduce its principal risk by settling foreign exchange transactions through the use of FMIs that provide PvP arrangements, where practicable. Otherwise, an AI should properly identify, measure, control and reduce the size and duration of its remaining principal risk as well as replacement cost risk (also see subsection 6.4). In a longer run, AIs are encouraged to support initiatives to have all trades become eligible for settlement through available PvP arrangements.

6.2.3 AIs should ensure that there are adequate board and/or senior management oversight of, and prudent counterparty exposure limits for, foreign exchange settlement-related risks of individual counterparties, including limits for principal risk and replacement cost risk ("foreign exchange settlement limits"). AIs should refer to CR-G-13 "Counterparty Credit Risk Management" for specific guidance on management of counterparty credit risk.

6.2.4 In particular, principal exposures that arise from non-PvP settlements should be recognised and treated equivalently to other credit exposures of similar duration and size to the counterparty. As an example, if the foreign exchange settlement exposure to a counterparty lasts overnight, the limit may be assessed in relation to the AI's willingness to lend directly to this counterparty on an overnight basis. Limits should be based on the level of credit risk that is prudent and should not be set at an arbitrary, high level just to facilitate trading with a counterparty.

6.2.5 Any exception to established foreign exchange settlement limits should be subject to approval by the appropriate authority in advance and in accordance with established policies and procedures.

6.2.6 AIs should have sufficiently robust systems to capture, measure and report on foreign exchange settlement-related exposures across business lines and counterparties. The amount of exposures pending settlement should be updated promptly when new deals are struck or when events (such as fails) mean that the exposures from existing trades last longer than expected. Effective monitoring of the outstanding exposure is crucial to the management of foreign exchange settlement-related risks. AIs should ensure that their risk management frameworks identify failed foreign exchange transactions and capture the full amount of the resulting settlement-related risks as soon as practicable. They should also have escalation policies and procedures in place for the reporting of potential foreign exchange issues and risks in a timely manner.

6.2.7 AIs should take steps to avoid any under-estimation of the risk they incur both intraday and overnight, given the full size and duration of their remaining foreign exchange settlement exposures. This means AIs have to accurately measure when a settlement exposure will begin and when that exposure will end. In particular, an AI should be able to measure accurately the size and duration of its settlement exposures by identifying explicitly both the unilateral payment cancellation deadline for individual foreign exchange transactions and the time needed for checking the receipt of funds for the currency bought. The AI should assume that funds have not been received until the final settlement of a transaction has been confirmed and reconciled.

6.2.8 AIs should put additional emphasis on those exposures that are particularly large or with less creditworthy counterparties, or where there has been a series of fails that may indicate an underlying credit-worthiness problem. However, if, despite these precautions, unauthorised excesses or settlement failures do still occur, a review by the credit management personnel should take place shortly thereafter so that any necessary corrective action can be taken.

6.2.9 In relation to liquidity risk, an AI should identify, measure, monitor and control its liquidity needs in each currency, taking into consideration the settlement method and any applicable netting arrangements. AIs may refer to LM-2, "Sound Systems and Controls for Liquidity Risk Management" (particularly section 6 of the module), for specific supervisory guidance in this respect.

6.3 Operational and legal risks

6.3.1 An AI may also face foreign exchange settlement-related risks caused by weaknesses in its own operations and in the legal enforceability of contractual terms and the governing law applicable to its transactions. If an AI has inadequate operational capabilities or if there are weaknesses in the legal basis for the pre-settlement and settlement arrangements, it can face increased principal risk, replacement cost risk and liquidity risk relating to counterparty failure.

6.3.2 For the effective management of operational and legal risks associated with settlement of foreign exchange transactions, AIs are expected to:

- have in place established processes and procedures on trade confirmation and affirmation[15]

[15] A trade confirmation is legal evidence of the terms of a foreign exchange transaction. A confirmation should include trade details, settlement instructions and other relevant information to allow each counterparty to agree to the trade terms. Trade affirmation involves acknowledging a counterparty

and, where practicable, use electronic methods and standard settlement instructions to maximise the use of straight-through processing;

- have sufficient capacity and scalability to handle increasing and potential large trading spikes in stress situations as appropriate, taking into consideration the trading behaviour of the AI and its clients;
- ensure that agreements and contracts are legally enforceable for each aspect of the AIs' foreign exchange activities in all relevant jurisdictions, and know with a high degree of certainty when settlement finality occurs as a matter of law and plan for actions that may be necessary if settlement finality is not achieved; and
- have business contingency plans (see subsection 6.5 below) for dealing with settlement failures and other problems as well as for ensuring continued operations following a disruption.

6.3.3 AIs should refer to OR-1, "Operational Risk Management", for additional guidance on management of operational and legal risks.

6.4 Alternative arrangements for reducing foreign exchange settlement-related risks

6.4.1 AIs are encouraged to take various steps to reduce their foreign exchange settlement-related risks.

6.4.2 AIs can reduce the duration of their settlement exposures by having the capability to unilaterally cancel payment instructions as late as practicable and negotiating better cancellation cut-off times with correspondents [16] and improving internal processing (e.g. identifying receipts of funds sooner or shortening the time for conducting AIs' own reconciliations).

trade notification or confirmation. Both trade confirmation and affirmation can take many forms (e.g. electronic, paper or voice over a recorded phone line).

[16] The documentation covering a correspondent's service agreement should include a cancellation cut-off time, which is the latest time a correspondent can guarantee to satisfy a cancellation request.

6.4.3 An AI can reduce the size of its counterparty credit risk exposures by:

- entering into legally enforceable bilateral netting agreements and master netting agreements[17] with all counterparties, where practicable; and
- using legally enforceable collateral arrangements to mitigate replacement cost risk. An AI can exchange the full amount of variation margin necessary to fully collateralise its mark-to-market exposure on physically settled foreign exchange swaps and forwards with counterparties that are financial institutions.

AIs should refer to CR-G-13, "Counterparty Credit Risk Management" for detailed guidance on relevant risk mitigating practices.

6.4.4 While netting and collateral arrangements can significantly reduce foreign exchange settlement-related risks, they are usually not capable of removing the associated counterparty credit risk entirely.[18] In addition, significant liquidity, legal and operational risks may remain. For example, if, because of operational problems, transactions that had been scheduled to be settled through a netting arrangement had unexpectedly to be settled gross, an AI might not have the liquidity to settle those transactions on a timely basis. AIs should ensure that the net bilateral exposures are appropriately controlled or are avoided by the use of PvP settlement methods.

6.4.5 AIs should use PvP arrangements to reduce their foreign exchange settlement-related risks, and to encourage their counterparties to do the same, where practicable. Such arrangements include the PvP service provided by CLS Bank, and the Real Time Gross Settlement System

[17] Master netting agreements are not valid in all jurisdictions. If an AI trades in a jurisdiction that does not support master netting agreements, then it should manage foreign exchange settlement-related principal risk appropriately (usually gross). AIs may refer to the BCBS FX Guidance for more information on the use of netting as a risk mitigant for settlement-related risks of foreign exchange transactions.

[18] See Section C of the Annex to the BCBS FX Guidance.

(currently available for the currency pairs USD/HKD, USD/CNH, USD/EUR, EUR/HKD, EUR/CNH, CNH/HKD, USD/MYR, USD/IDR and USD/THB).[19]

6.4.6 An AI's risk management framework should include procedures to identify the most appropriate settlement method for each type of foreign exchange transaction, given the size, nature complexity and risk profile of the AI's foreign exchange activities.

6.4.7 When assessing different available settlement methods, in addition to the more transparent costs (e.g. fees), AIs should take full account of the less transparent benefits or cost savings associated with a particular settlement method, such as the risk-reduction effects, lower cash management costs, higher straight-through processing rates or other operational efficiencies.

6.4.8 Similarly, in respect of the selection of an FMI or a correspondent bank for settlement purposes, an AI should conduct robust due diligence to assess the associated risks and benefits. For instance, the assessment should include a review of the legal, operational, credit and liquidity risks associated with the use of an FMI or correspondent banking services. Policies and procedures should be in place for the periodic reviews of the FMIs or correspondent banks adopted and the timely adoption of risk mitigation measures to address foreign exchange settlement-related risks that may arise.

6.5 Contingency planning for settlement-related risks

6.5.1 Contingency planning should be an integral part of an AI's management process of foreign exchange settlement-related risks to ensure continued operations following a disruption (e.g. due to failed transactions or other settlement problems). AIs should identify and address various plausible events that could lead to disruptions in their foreign exchange-related operations and have appropriate systems, backup procedures and

[19] https://www.hkma.gov.hk/eng/key-functions/international-financial-centre/financial-market-infrastructure/payment-systems/

staffing plans to mitigate such disruptions. The contingency plan should be documented and regularly reviewed, updated and tested.

6.5.2 Adequate contingency planning in foreign exchange settlement-related risks includes ensuring timely access to key information, such as payments made, received or in process, and developing procedures for obtaining information and support from correspondent institutions.

6.5.3 AIs should have a contingency plan in place to ensure continuity of their foreign exchange settlement operations if the main production site becomes unusable. This plan should be documented and supported by contracts with outside vendors, where such vendors provide services to the AI that are necessary either to its normal foreign exchange settlement or to its contingency plan.

6.5.4 As in many cases the causes and impacts of a settlement failure and the actions taken may be similar, contingency planning for foreign exchange settlement problems should be co-ordinated with the contingency planning for related risks (such as counterparty credit risk, liquidity risk and operational risk). Many of the requirements and practices cited in TM-G-2 "Business Continuity Planning", and requirements on contingency planning in relevant SPM modules (e.g. CR-G-13 and LM-2), are generally applicable.

7. Foreign exchange exposures of borrowers

7.1 Monitoring systems

7.1.1 A credit-related aspect of foreign exchange risk management is the monitoring of borrowers' foreign exchange exposures. This recognises that adverse changes in exchange rates could worsen the ability of an AI's borrowers to service their obligations under different situations. For example:

- a borrower's local currency holdings and cash flow may become inadequate to service its foreign currency obligations because of devaluation in the local currency or vice versa;

- if a country suffers from economic, political or social problems, leading to a decline in its foreign currency reserves, borrowers in that country may not be able to convert their funds from local currency into foreign currency to repay their external obligations; and
- some borrowers (e.g. financial institutions) may have substantial foreign exchange exposures in trading activities.

7.1.2 As part of their credit management process, AIs should satisfy themselves that those borrowers to which they have extended foreign currency loans have sufficient assets or income streams to service their obligations in that currency.

7.1.3 The HKMA will determine whether an AI has effective systems for monitoring borrowers with large foreign exchange exposures. In particular, it will consider whether the AI has:

- procedures for monitoring and analysing borrowers' foreign exchange exposures. The AI should, where appropriate, seek to understand the purposes/strategies behind their foreign exchange transactions, especially for those clients (including financial institutions) that may have substantial foreign exchange trading activities. Attention should also be drawn to foreign exchange transactions that deviate significantly from their usual trading patterns or trends;
- procedures for evaluating borrowers' capability to service their foreign currency obligations, including the use of stress tests, where this is warranted, to assess the impact of adverse exchange rate movements on their positions with the AI; and
- proper controls (e.g. through credit limits) to manage the credit risk associated with borrowers' foreign exchange exposures.

7.1.4 To comply with the HKMA's requirements mentioned above, AIs should incorporate the monitoring of borrowers' foreign exchange exposures into their credit approval systems (see section 2 of CR-G-2 "Credit Approval, Review and Records").
