



## Supervisory Policy Manual

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Foreign Exchange Risk Management

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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 to provide guidance to AIs on the key elements of effective foreign exchange risk management

### 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### Previous guidelines superseded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

### Application

To all AIs

### Structure

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### 1 Introduction

#### 1.1 Terminology

##### 1.1.1 In this module

- “foreign exchange risk” means the risk of financial loss to an AI arising from adverse movements in foreign exchange rates; and
- “foreign exchange settlement risk” means the risk of financial loss to an AI when it pays the currency it sold but does not receive the currency it bought in a foreign exchange transaction.

#### 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)<sup>1</sup>; 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 can pose a significant threat to AIs’ earnings and capital adequacy. They

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<sup>1</sup> Foreign currency positions in the banking book are also subject to foreign exchange risk as accounting conventions require these positions to be periodically revalued and translated into the base currency at current exchange rates.



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should therefore address the risk arising from foreign exchange operations and exposures in three ways:

- maintaining an effective system of internal control to identify, measure, monitor and control the extent and nature of the risk;
- setting appropriate limits on such risk exposures to avoid any risk concentration; and
- holding adequate capital against the possibility of loss. The capital requirements for foreign exchange risk exposures of locally incorporated AIs are captured under Part 8 of the Banking (Capital) Rules on the calculation of market risk<sup>2</sup>.

1.2.4 AIs should also be aware of the potential impact of inter-relationships 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 (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 mismatches are set out in [LM-1](#) “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 the Basel Committee papers on “Supervision of Banks’ Foreign Exchange Positions” (1980), “Core Principles Methodology” (1999), “Supervision Guidance for Managing Settlement Risk in

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<sup>2</sup> The market risk capital requirements are also highlighted in [CA-G-1](#) “Overview of Capital Adequacy Regime for Locally Incorporated Authorized Institutions”.



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Foreign Exchange Transactions” (2000) and “Progress in Reducing Foreign Exchange Settlement Risk” (2008).

### 1.3 Scope

#### 1.3.1 This module:

- provides guidance on the processes for effective management of foreign exchange risk (including settlement risk 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](#) “General Risk Management Controls”. The criteria and sound practices for general risk management contained therein are also applicable to effective foreign exchange risk management.

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.

### 1.4 Implementation

1.4.1 AIs are expected to put in place the necessary systems and procedures to comply with the additional requirements of this revised module relating to controls on settlement risk within a reasonable period of time which is commensurate with the nature, complexity and scale of their foreign exchange risk exposures. The HKMA will monitor the progress of AIs in meeting the relevant standards in the course of its ongoing supervision.



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## 2 Classification of foreign exchange risk exposures

### 2.1 Structural versus trading

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 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



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to exclude the “structural positions” defined by an AI from the foreign exchange limits specified in para. 3.3.3 of this module. 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 US\$ against HK\$ positions

2.2.1 Under the linked exchange rate mechanism for the Hong Kong dollar, arbitrage in the foreign exchange market when the rate deviates from HK\$7.8 to US\$1 is an important means for maintaining the stability of the exchange rate. While the volatility of US\$/HK\$ 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 below).

### 2.3 Bullion

2.3.1 As a general rule, transactions that involve risks similar to those in foreign exchange should be included in the calculation of an AI’s foreign currency position. Positions



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arising from bullion (including gold indexed deposits) belong to this type of transactions.

### 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 risk 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 [CA-G-5](#) "Supervisory Review Process" for details of the HKMA's framework for assessing the adequacy of locally incorporated AIs' capital to cater for risks that are not covered or adequately covered under the Banking (Capital) Rules.
- 3.1.2 As part of the on-site examination process, the HKMA will evaluate whether an AI's measurement systems can identify and quantify adequately foreign exchange risk exposures arising from its business. The HKMA will also analyse the integrity and effectiveness of the AI's foreign exchange risk management process to ensure that its practices comply with the objectives and risk tolerance limits approved by the Board or an appropriate committee delegated with this authority, e.g. Asset and Liability Committee ("ALCO").
- 3.1.3 In considering whether an AI has appropriate systems for managing foreign exchange risk, the HKMA will have regard to the nature and complexity of the AI's foreign exchange risk exposures and its compliance with the relevant standards and sound practices set out in [IC-1](#) "General Risk Management Controls", [Guideline 12.2](#) "Risk Management of Derivatives and Other Traded Instruments" and this module.





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3.1.4 The HKMA's expectations regarding AIs' management of foreign exchange settlement risk 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 safety and soundness of an AI's foreign exchange risk management and exposures, the HKMA will primarily take into consideration the following:

- the complexity and level of foreign exchange risk posed by its foreign currency assets, liabilities and off-balance sheet 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 internal review and audit of its foreign exchange risk management process; and
- the appropriateness of the AI's level of foreign exchange risk in relation to its earnings, capital 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 using 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



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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<sup>3</sup>.
- 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 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

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<sup>3</sup> The positions include those in both the banking book and trading book.



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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 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.
- 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 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 convenient 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



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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 changes in foreign exchange rates. As part of sound management, AIs should incorporate the level of foreign exchange risk they undertake into their overall evaluation of capital adequacy. Where AIs' business involves taking significant foreign exchange risk<sup>4</sup>, they should also place emphasis on the use of stress-testing techniques to evaluate the adequacy of capital to support the risk (see subsection 5.6 below).

3.4.2 The HKMA expects locally incorporated AIs to maintain adequate capital for the risks, including foreign exchange risk, they undertake and to develop their own processes for internal assessment of capital adequacy (see relevant standards set out in [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 internal systems for managing foreign exchange risk and settlement risk in a safe and sound manner. The relevant criteria are set out in sections 5 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.

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<sup>4</sup> AIs should assess the level of significance of their foreign exchange risk (in relation to profitability and capital base) based on their own measure of market risk using the standardized approach, the internal models approach or the approach used by their parent bank to calculate market risk (where permitted by the MA) under the Banking (Capital) Rules (also see [CA-G-1](#) "Overview of Capital Adequacy Regime for Locally Incorporated Authorized Institutions").



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3.5.2 The HKMA will require AIs to bring their 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 its 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](#) "General Risk Management Controls" for details of their risk management responsibilities. Many of the requirements and practices cited have a general application.

4.1.2 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.

4.1.3 The Board and senior management should be promptly advised of any large losses arising from foreign exchange risk (or any possibility of such losses).

### 4.2 Asset and Liability Management Committee

4.2.1 Larger or more complex AIs should have ALCOs, responsible for the design and administration of foreign exchange risk management.

4.2.2 The main role and functions of ALCO are described in [CG-1](#) "Corporate Governance of Locally Incorporated Authorized Institutions".

### 4.3 Independent risk management

4.3.1 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 an



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adequate understanding of all sources of foreign exchange risk faced throughout the AI.

- 4.3.2 There should be adequate segregation of duties in 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.

### 4.4 Staff competence

- 4.4.1 AIs should ensure that staff involved in their foreign exchange operations have the necessary knowledge and expertise to undertake their duties. In this regard, AIs should consider a combination of important factors, e.g. experience and relevant professional qualifications<sup>5</sup>, when recruiting employees for their treasury market activities.

## 5 Foreign exchange operations

### 5.1 General

- 5.1.1 AIs' policies and procedures for foreign exchange risk management should cover the general criteria set out in [IC-1](#) "General Risk Management Controls" and other criteria specific to foreign exchange risk as discussed in the following subsections.
- 5.1.2 The policies, procedures and limits should be properly documented, drawn up after careful consideration of the foreign exchange risk associated with different types of products, reviewed and approved by management at the appropriate level, and circulated to all relevant departments and units.
- 5.1.3 It is important to supplement such policies and procedures with ethical rules and standards which employees engaged in foreign exchange trading should observe. These rules and standards should address

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<sup>5</sup> Such professional qualifications may include, among others, membership of the Treasury Markets Association and being an Associate of the Hong Kong Institute of Bankers (Treasury Management).



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issues concerning potentially problematic trading practices, such as trading at illiquid hours, spreading of rumours and false information<sup>6</sup>. Minimum requirements on staff conduct such as control over personal investments, use of information and the acceptance of gifts are set out in [CG-3](#) “Code of Conduct”.

### 5.2 New services and strategies

- 5.2.1 AIs should identify the foreign exchange 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 foreign exchange options trading may not fit in well with its risk profile and expertise. Such new 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 such as ALCO.

### 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 risk. The systems should evaluate the effect of foreign exchange rate changes on profitability and capital

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<sup>6</sup> See also The Model Code, an international code of conduct and practice for the financial markets issued by the ACI - The Financial Markets Association and endorsed by the Treasury Markets Forum of Hong Kong. The two institutions were merged to form the Treasury Markets Association (<http://www.tma.org.hk>) in January 2006.



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adequacy meaningfully and accurately within the context and complexity of their 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. by-tenor vega) 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<sup>7</sup>;
- enable AIs to identify and measure accurately their foreign exchange settlement risk incurred both intraday and overnight (see para. 6.1.7 below), 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 below); 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 AIs which use value-at-risk to measure aggregate foreign exchange risk should meet the relevant requirements set out in [CA-G-3](#) "Use of Internal Models Approach to Calculate Market Risk".

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<sup>7</sup> Any manual adjustments to underlying data should be clearly documented and the nature and reasons for the adjustments should be clearly understood.





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- 5.3.4 The experience of the 1997-98 Asian Crisis shows that the volatility of some currencies in the Region could increase suddenly and in an extraordinary manner because of severe shocks in the foreign exchange market. The high foreign exchange volatility, the extent of contagion effects and the speed with which some markets in the Region could become illiquid have surprised many market participants. Under such conditions, value-at-risk results and other similar methodologies for measuring their potential foreign exchange risk would lag behind and underestimate the movements in foreign exchange rates. This is one of the well-known weaknesses of the value-at-risk methodology.
- 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 volatility of the currencies.
- 5.3.6 There should also be an accurate, informative and timely management information system (“MIS”) for foreign exchange risk. This is essential both to keep 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 indicators on market risk as well as operational risk arising from foreign exchange operations. 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.



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### 5.4 Risk monitoring and control of foreign exchange trading operations

- 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 unauthorized 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<sup>8</sup> (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 authorized 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 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

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<sup>8</sup> It is understood that there may not be clear segregation of middle and back office functions in some AIs and some of the middle office functions may be assumed by the back office as well.



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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 authorized 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.



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- 5.4.13 Als engaging in foreign exchange options trading should ensure that the traders and middle/back office staff have the necessary competence and expertise (also see para. 4.4 and footnote 5) 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. deep-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.
- 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<sup>9</sup>. After-hours or off-premises dealing should be restricted to specially designated traders only and be closely monitored.

### 5.5 Limits

- 5.5.1 Als' 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 above). 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 volatility of some currencies increases suddenly and in an extraordinary manner.

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<sup>9</sup> However, squaring of their trading positions either to take profit or to stop loss at the predetermined price level is allowed.



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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 overseas branches and banking subsidiaries, here and abroad.

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

- 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. Limits for aggregate risk of all currencies could be in terms of value-at-risk (see para. 5.3.3 above);
- 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)<sup>10</sup>; and
- limits for settlement risk of all counterparties (see subsection 6.1 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. This

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<sup>10</sup> Details of option limits are covered in [Guideline 12.2](#) "Risk Management of Derivatives and Other Traded Instruments".



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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 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 Crisis in the late nineties;
- 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 correlation among currencies; and
- default of long-term assets denominated in foreign currencies.

### 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 settlement risk) to ensure its integrity, accuracy and reasonableness. Such reviews



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should be conducted by independent parties, e.g. internal or external auditors.

5.7.2 The reviews should, among other things, ensure:

- accuracy and completeness of recording of all transactions;
- effective segregation of duties between trading, settlement and accounting functions; and
- effectiveness and accuracy of reporting of excesses of limits and other exceptions.

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 risk

### 6.1 Monitoring of foreign exchange settlement risk

6.1.1 Foreign exchange settlement risk involves both credit risk and liquidity risk. In a transaction that fails to settle, an AI faces 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 risk exists for any traded product but the size of the foreign exchange market makes foreign exchange transactions generally the greatest source of settlement risk for AIs.



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- 6.1.2 Foreign exchange settlement failures can arise from counterparty default, operational problems, market liquidity constraints and other factors<sup>11</sup>.
- 6.1.3 AIs should ensure that there are prudent limits to control the settlement risk of individual counterparties. Foreign exchange settlement exposures should be subject to an adequate credit control process, including credit evaluation of the maximum exposure the AI is willing to accept for a particular counterparty (“foreign exchange settlement limit”).
- 6.1.4 Such limits should be subject to the same procedures used for deciding limits on 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.
- 6.1.5 Any planned excesses of settlement limits should be subject to approval by the appropriate credit management personnel in advance of the excess occurring<sup>12</sup>.
- 6.1.6 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 risk.

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<sup>11</sup> The 11 September episode in the US suggests that such events could have a potential impact on the functioning of payment systems (e.g. in terms of causing settlement delay or even disruption).

<sup>12</sup> However, unplanned excesses may sometimes occur. This may be because, when the deal is struck, a limit has not yet been reduced to reflect other deals recently struck. Or it may be because, when the time comes for the deal to be settled, unexpected events (such as the failure of other transactions to settle) cause exposures to be higher than planned. AIs should take steps to minimise these possibilities.





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- 6.1.7 Als should take steps to avoid any under-estimation of the risk they incur both intraday and overnight, given the full size and duration<sup>13</sup> of their remaining foreign exchange settlement exposures. In particular, Als should be able to measure accurately the size and duration of their settlement exposures by identifying explicitly both the unilateral payment cancellation deadline (see footnote 13 below) for individual transactions and the time needed for checking the receipt of funds for the currency bought. They should also recognise that some of their settlement obligations may last for more than one day, affected by such factors as time zone differences of the currency pair involved or banking practices and corresponding banking arrangements (e.g. where the correspondent bank of an AI requires a significant notification period to cancel a payment instruction or where the correspondent bank received the funds on settlement day but took some time to credit them to the AI's account).
- 6.1.8 Als 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, unauthorized 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.
- 6.1.9 For effective management of foreign exchange settlement risk, Als are expected to have:
- clear senior level responsibility and authority for managing foreign exchange settlement exposures with individual counterparties, and appropriate daily management procedures for these exposures (such as the application of limits);

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<sup>13</sup> The duration of an AI's foreign exchange settlement exposure runs from the time that the AI can no longer unilaterally cancel its instruction to pay the currency it is selling (i.e. the unilateral payment cancellation deadline) and ends when it receives with finality the currency it is buying.



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- institution-wide business policies that provide for the choice of settlement methods through appropriate risk measurement and cost-benefit analyses (also see para. 6.2.9 below), with adequate incentives and controls for individual business units to follow the policies;
- measurement systems that provide appropriate estimates of foreign exchange settlement exposures on a timely basis;
- systems that monitor closely any limit excesses and unusual settlement activity;
- stress tests to evaluate their capacity to withstand stressed situations such as settlement delay, individual counterparty failures and disruption of payment systems<sup>14</sup>; and
- procedures including contingency plans (see subsection 6.3 below) for dealing with settlement failures and other problems.

6.1.10 The methods and procedures employed by AIs should be commensurate with the range and scope of their activities. The HKMA will assess the adequacy of such methods and procedures as part of its ongoing supervision.

### 6.2 Alternative arrangements for settlement risk reduction

6.2.1 AIs are encouraged to take various steps to reduce their foreign exchange settlement risk.

6.2.2 AIs can reduce the duration of their settlement exposures by improving unilateral payment cancellation deadlines by, for example, negotiating better cancellation cut-off times with correspondents<sup>15</sup> and improving

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<sup>14</sup> AIs are expected to design stress scenarios that are appropriate to the nature and complexity of their foreign exchange operations. For example, an AI may estimate the potential loss or impact on its cash flows arising from: (i) the delay in settlement of its transactions for a specified period of time; (ii) the default of one or more of its major counterparties upon settlement; or (iii) a temporary disruption of payment systems due to IT problems.

<sup>15</sup> 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.



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internal processing (e.g. identifying receipts of funds sooner or shortening the time for conducting AIs' own reconciliations).

6.2.3 AIs can reduce the size of their counterparty exposures by entering into legally binding agreements to net settlement payments bilaterally<sup>16</sup>. Legally binding payment netting arrangements permit AIs to offset trades against each other so that only the net amount in each currency is paid or received by each institution.

6.2.4 The use of bilateral payment netting requires some modification to an AI's method of measuring settlement exposures. When bilateral payment netting is used, all the transactions with a particular counterparty due to settle on that day have to be considered together. The AI will:

- make a single payment to the counterparty in each of the currencies where it has a net debit position; and
- receive a single payment in each of the currencies where it has a net credit position.

The maximum value of the resulting settlement exposure is simply equal to the sum of the amounts due to be received from the counterparty<sup>17</sup>.

6.2.5 To allow exposures to be measured on a net basis, the legal basis for payment netting arrangements should be sound. In particular, AIs should ensure that a netting arrangement is legally enforceable in all relevant jurisdictions.

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<sup>16</sup> Depending on trading patterns, bilateral payment netting can significantly reduce the value of currencies settled. It also reduces the number of payments to one per currency either to or from each counterparty.

<sup>17</sup> However, measuring the actual duration of the exposure is more complicated because netted transactions result in a set of payments in a number of currencies, no two of which can simply be paired to calculate the period of irrevocability (i.e. the interval from the unilateral payment cancellation deadline for the sold currency until final receipt of the bought currency). Rather, the exposure will build up to its maximum value as the cancellation deadline for each of the net debit currencies paid is reached, and will fall as each of the net credit currencies is received. Any method of measurement - whether an exact measure or an approximation - needs to make appropriate allowance for this.



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- 6.2.6 While bilateral netting arrangements can significantly reduce foreign exchange settlement risk, they are usually not capable of removing credit risk entirely. 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 payment versus payment (“PvP”) settlement methods.
- 6.2.7 AIs are strongly encouraged to use PvP arrangements in Hong Kong to reduce their foreign exchange settlement risk, and to encourage their counterparties to do the same. Such arrangements include the PvP service provided by CLS Bank, and the Real Time Gross Settlement System (currently available for the Hong Kong dollar, US dollar and Euro).
- 6.2.8 Through the use of PvP settlement, the two legs of a foreign exchange transaction are settled simultaneously. This eliminates the settlement risk arising from the two legs of a foreign exchange transaction being settled in different time zones. For example, without PvP settlement, the buyer of US dollars against Hong Kong dollars will have paid the Hong Kong dollars and be exposed to a settlement risk while waiting for the receipt of the US dollars in New York more than 12 hours later.
- 6.2.9 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.

### 6.3 Contingency planning for settlement risk

- 6.3.1 Contingency planning should be an integral part of AIs’ foreign exchange settlement risk management process. Each AI should set down a contingency plan that specifies procedures for reacting in a prompt and



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balanced manner to failed transactions or other settlement problems.

- 6.3.2 Adequate contingency planning in foreign exchange settlement risk 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.
- 6.3.3 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.
- 6.3.4 Because in many cases the action taken will be similar, contingency planning for foreign exchange settlement problems should be co-ordinated with the planning for other problems (such as payment system or trading room failures). Many of the requirements and practices cited in [TM-G-2](#) “Business Continuity Planning” 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



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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").



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