



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Circular No. 029/B/2025-DSB/AMCM
(Effective Date: 01/01/2026)

Guideline on Management of Liquidity Risk

The Monetary Authority of Macao (AMCM), under the powers conferred by Article 9 of the Charter approved by Decree-Law No.14/96/M of 11th March and by Article 8 of Law No.13/2023 (the Financial System Act), establishes the following:

Introduction

1. Liquidity is the ability of an institution to fund increases in assets or meet obligations as they come due, without incurring unacceptable losses. Liquidity risk¹ may arise from an institution's inability to manage the maturity mismatches of its assets and liabilities, manage the unplanned changes in funding sources or address changes in market conditions. A market disruption or liquidity squeeze may also affect an institution's ability to liquidate assets quickly and with minimal loss in value.
2. Credit institutions are particularly vulnerable to sudden and unexpected demands on them for funds. Since the liquidity shortfall at a credit institution may have systemic consequences for other credit institutions and for the financial system as a whole, the proper management of liquidity risk is crucial to the ongoing viability of all credit institutions.
3. The AMCM recognizes that the formality and sophistication of the process used to manage liquidity (or liquidity risk) may vary among credit institutions depending on their size and the nature and complexity of their operations. Nevertheless, it is considered that for a credit institution of any size or scope of operations, the same crucial elements for strong liquidity management should include adequate management oversight, good management information system, analysis of net funding requirements under alternative scenarios, diversification of funding sources, and contingency funding planning.
4. In accordance with the principles advocated by the Basel Committee on Banking Supervision (BCBS) in its paper "Principles for Sound Liquidity Risk Management and Supervision", this Guideline sets out the key requirements for

¹ This Guideline focuses primarily on funding liquidity risk. Funding liquidity risk is the risk that an institution will not be able to meet efficiently both expected and unexpected current and future cash flow and collateral needs without affecting either daily operations or the financial condition of the institution. Market liquidity risk is the risk that an institution cannot easily offset or eliminate a position at the market price because of inadequate market depth or market disruption.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

the management of liquidity risk and outlines the AMCM's approach in the supervision and assessment of credit institutions' policies and practices related to the management of liquidity risk. It applies to all credit institutions either locally incorporated or being branches of overseas incorporated credit institutions in Macao. Credit institutions are encouraged to also read and understand the principles set out in the abovementioned Basel paper (an extract of the main principles is given in *Appendix I*).

Key Requirements for the Management of Liquidity

5. A credit institution should be responsible for the sound management of liquidity risk and should establish a robust liquidity risk management framework that ensures it maintains sufficient liquidity, including a cushion of unencumbered, high-quality liquid assets, to withstand a range of stress events, including those involving the loss or impairment of both unsecured and secured funding sources.
6. A credit institution should have an effective liquidity management framework that includes the following elements:
 - (a) governance of liquidity risk management;
 - (b) strategy and policies for managing liquidity risk;
 - (c) system and tools for measuring liquidity;
 - (d) ongoing processes for monitoring and controlling liquidity;
 - (e) formal contingency funding plan for dealing with liquidity disruptions; and
 - (f) public disclosure.
7. The liquidity management framework of a Macao incorporated credit institution should cover both its local and overseas operations, as well as all related entities which have impact on the credit institution's liquidity. Where a credit institution manages liquidity on a group basis, the framework should cover both the credit institution and the group as a whole. The liquidity management framework for both locally and overseas incorporated credit institutions should address all on- and off-balance-sheet activities across all currencies.
8. Details of the AMCM's requirements on the above elements of liquidity management are given at paragraphs 9 to 73 below.

Governance of Liquidity Risk Management

9. A credit institution should assign responsibility for managing their overall liquidity and decide on the structure for liquidity management. The liquidity



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

costs, benefits and risks implicit in all significant business activities should be explicitly attributed to the relevant activity.

Board and Senior Management Responsibility

10. The primary responsibility for the prudent management of liquidity risk rests with the board of directors (the Board)^{2,3} and senior management of a credit institution. The Board should first establish the credit institution's liquidity risk tolerance by defining the level of liquidity risk that the credit institution is willing to assume. In accordance with the risk tolerance, a liquidity risk strategy should be developed and this could be expressed as various high-level quantitative and qualitative targets taking into account the credit institution's liquidity needs under normal conditions as well as liquidity implications under periods of liquidity stress.
11. The Board should approve the liquidity risk tolerance, strategy and significant policies relating to the management of liquidity. The Board should also ensure that senior management takes the steps necessary to monitor and control liquidity. The Board and senior management should be informed regularly of the liquidity situation of the credit institution and immediately if there are any material changes in the credit institution's current or prospective liquidity position. The Board and/or senior management may delegate the responsibility for managing the overall liquidity to a specific, identified group within the credit institution. For example, an Asset/Liability Committee (ALCO) comprised of senior management, the treasury function and/or a risk management department. Apart from ensuring that the credit institution has adequate funds to meet its obligations, the ALCO usually will have the following roles:
 - (a) to facilitate, coordinate, communicate and control balance sheet planning with regards to risks inherent in managing liquidity and convergences in interest rates; and
 - (b) to ensure that the credit institution's operations lie within the parameters set by the Board / senior management.
12. There should be adequate Board and/or senior management oversight over the ALCO, which should maintain written reports of the deliberations and decisions with regards to liquidity risk management. In determining the composition, size and various roles of the ALCO, the Board and/or senior management should consider the size of the credit institution, the risks inherent in the credit institution's operations and the organisational complexity.

² In the case of branches of overseas incorporated credit institutions, the reference to the "board of directors / the Board" in this Guideline refers to, depending on the circumstances, either the branches' local management or, the management at the head office responsible for the operations of the branches.

³ In the case of a Macao incorporated credit institution, the reference to the "board of directors / the Board" in this Guideline includes any director or committee that is assigned to handle matters that require the board's review / approval but arise between full board meetings.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Liquidity Management Structure

13. A credit institution may centralise or decentralise its liquidity management function or adopt a combination of the two. For example, in a centralised structure, the liquidity for individual business units, including branches and subsidiaries would be managed on a consolidated basis. On the other hand, in a decentralised structure, individual business units would be responsible for their own liquidity subject to limits imposed by senior management. The structure to be adopted would depend on the credit institution's size and complexity of operations. Nevertheless, it is important that the liquidity management procedures should address any regulatory, legal or operational limitations to the transferability of liquidity across jurisdictions and/or entities.
14. A credit institution incorporated in Macao that decentralises or partially delegates liquidity management amongst operating units should clearly document the policies and limits established for those units as well as any internal liquidity support arrangements provided to those units. The policies should also address how the liquidity of those units is monitored and controlled by head office management in Macao.
15. Where a credit institution incorporated in Macao provides significant funding and other liquidity support to subsidiaries and associates, it would need to satisfy the AMCM that such support is appropriately captured in the measurement of its liquidity position. As necessary, the AMCM may require a credit institution to place limits on such support.
16. A branch of overseas credit institution in Macao are expected to manage its own liquidity but the AMCM is prepared to consider their liquidity management in a global context, having regarded to:
 - (a) the extent to which liquidity of the overseas credit institution is managed, and supervised, on an integrated global basis;
 - (b) the reliance placed on funding from head office and other branches;
 - (c) the ability and willingness of head office to provide liquidity at all times as required – the AMCM may seek an assurance from the head office regarding the provision of liquidity to the branch;
 - (d) whether the home country supervisor of the overseas credit institution is aware of, and has no objections to, any dependence by the branch on head office for liquidity support and any assurance provided by head office regarding the provision of such support; and
 - (e) the particular policies governing the branch's liquidity management in Macao.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Quantification of Costs, Benefits and Risks

17. In order to (a) reinforce the credit institution's liquidity risk tolerance and strategy; and (b) bring the risk-taking incentives of individual business lines into alignment with the relevant liquidity risk exposures, a credit institution should appropriately incorporate liquidity costs, benefits and risks in its product pricing, performance measurement and new product approval process for all its significant business activities (both on- and off-balance-sheet).
18. The liquidity costs, benefits and risks should be explicitly attributed to the relevant activity with a liquidity charge assigned as appropriate to the credit institution's positions, portfolios, or individual transactions according to their riskiness. The anticipated holding periods of assets and liabilities, their market liquidity risk characteristics, and any other relevant factors, such as the stability of retail deposits should be taken into consideration in the quantification and attribution of liquidity costs, benefits and risks. Such quantification and attribution should be explicit and transparent at the line management level and should include consideration of how liquidity would be affected under stressed conditions.

Strategy and Policies for Managing Liquidity Risk

19. Senior management of a credit institution is expected to translate the credit institution's risk tolerance and strategy into clear guidance and operating standards, which could be in the form of policies, controls or procedures. The main guidance and/or standards, to be referred to as "liquidity management policy" in this Guideline, should be documented in writing and approved by the Board or a board committee. A copy of the liquidity management policy should be provided to the AMCM for its information.
20. A credit institution should strictly adhere to its liquidity management policy, which should be reviewed and approved at least annually. Any major changes to the policy should be submitted to the AMCM within 7 business days of such change.
21. Annual reviews should consider the changes in the credit institution's operating circumstances and continuously adopt best market practices. The annual reviews should also consider the assumptions utilised in the calculation of liquidity position to determine their validity (see also paragraphs 24(i) and 62).
22. The AMCM would assess the adequacy and rationality of a credit institution's liquidity management policy and may require the credit institution to adopt a more conservative approach, if the AMCM is concerned that the policy is detrimental to the credit institution's operations.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

23. The liquidity management policy, its objectives and any established limits should be communicated to all relevant staff members of the credit institution. These staff members should have a thorough understanding of the liquidity management policy and be updated of changes when revisions are effected.
24. The liquidity management policy should reflect the daily strategy and longer term liquidity plans. It should take into account all operations of significance and determine the sources, type and levels of liquidity that are to be maintained by the credit institution. The liquidity management policy should take account of liquidity needs under normal conditions as well as liquidity implications under periods of liquidity stress, the nature of which may be institution-specific or market-wide or a combination of the two. The key aspects to be considered and reflected in the policy should include:
- (a) the nature of the credit institution's business and the composition of assets and liabilities;
 - (b) the diversity and stability of the credit institution's sources of funds (for example, credit institutions that have established relatively stable customer bases through high levels of customer service and cross-selling of products may enjoy greater "stickiness" of deposits than credit institutions that rely on attracting deposits mainly through offering higher rates of interest.);
 - (c) the approach to managing liquidity in different currencies, across borders, and across business lines and legal entities;
 - (d) the approach to intra-day liquidity management;
 - (e) the regulatory reporting requirements;
 - (f) the responsibility for measuring and reporting liquidity internally within the credit institution, the frequency of internal reporting and how senior management monitors liquidity, including the framework of limits⁴ applied;
 - (g) inter-relationships between group entities in respect of liquidity risk management, with clearly identified procedures and defined responsibilities;
 - (h) the identified classes of marketable assets that may be held;
 - (i) the assumptions on the liquidity and marketability of assets and details of any specific assets or deposit liabilities that may be subject to behavioural adjustments⁵ for liquidity purposes;

⁴ Such limits may include, for example, liquidity ratios, size of maturity mismatches and the level of other liquidity indicators. Credit institutions are encouraged to set internal limits that are broader and tighter than the minimum standards required by the AMCM.

⁵ For certain assets (such as overdraft) or deposit liabilities (such as savings and demand deposits), the actual cash flows may have little relationship with contractual maturity. A credit institution will therefore need to apply cash flow adjustments to reflect the behaviour of these assets or liabilities. See also paragraph 62.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

- (j) the contingency funding planning; and
- (k) the arrangement for public disclosure.

System and Tools for Measuring Liquidity

25. A credit institution should set out their general liquidity strategies and specific goals and objectives on their level of liquidity. The possible impacts of other risks, such as credit risk⁶, market risk⁷ and operational risk⁸ etc. should be taken into account in setting these strategies and goals. Among other things, a credit institution's framework for the measurement as well as the monitoring and control of liquidity position should include the following processes:
- (a) projecting cash flows arising from assets, liabilities and off-balance-sheet items over an appropriate set of time horizons⁹;
 - (b) gauging the credit institution's capacity to raise funds quickly from each source¹⁰;
 - (c) managing the intra-day liquidity positions and risks to meet payment and settlement obligations under both normal and stressed conditions¹¹;
 - (d) managing the credit institution's collateral positions, differentiating between encumbered and unencumbered assets, and monitoring how it can mobilise collateral in a timely manner¹²; and
 - (e) maintaining a cushion of unencumbered, high quality liquid assets to be held as insurance against a range of liquidity stress scenarios¹³.
26. To accomplish the requirements in paragraph 25, the measurement of a credit institution's liquidity position should at least involve the use of the following tools and analysis:
- (a) stock of liquid assets;
 - (b) Liquidity Coverage Ratio (LCR);
 - (c) High-Quality Liquid Assets Adequacy Ratio (HQLAAR);
 - (d) Net Stable Funding Ratio (NSFR);
 - (e) contractual maturity mismatch analysis;
 - (f) liabilities diversification;
 - (g) loan to deposit ratio and other liquidity indicators;

⁶ e.g. the risk that may arise from a counterparty's failure to perform an obligation.

⁷ e.g. the risk that may arise from the adverse change in the market value of an asset.

⁸ e.g. the risk that may arise from the timing differences across payment and settlement systems.

⁹ See also principle 5 of the Basel Paper on the recommended practice.

¹⁰ See also principle 7 of the Basel Paper on the recommended practice.

¹¹ See also principle 8 of the Basel Paper on the recommended practice.

¹² See also principle 9 of the Basel Paper on the recommended practice.

¹³ See also principle 12 of the Basel Paper on the recommended practice.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

- (h) periodical review of the ability to obtain funds in the interbank and other wholesale markets; and
 - (i) internal limits on individual foreign currencies and arrangement for the review of such limits.
27. A credit institution should conduct analyses of its liquidity position on a regular basis with the required liquidity measures. When a credit institution expects any issue that will or may cause it to maintain a liquidity level or ratio of less than the minimum level required by the AMCM, the credit institution should promptly notify the AMCM of the issue with a valid reason and a liquidity plan for addressing the potential liquidity shortfall, as well as any relevant details and supporting documents upon request.

Stock of Liquid Assets

28. A credit institution should maintain an adequate stock of high-quality liquid assets to cater for any expected liquidity pressures or fluctuations under both normal and adverse operating conditions. Holdings of high-quality liquid assets can provide a credit institution with the capacity to meet its obligations. Such holdings also lower the likelihood of the need to undertake an urgent sale of illiquid assets, or purchasing liabilities at a higher cost than is sustainable over the medium term.
29. According to Notice no.002/2013-AMCM, a credit institution should hold an average weekly amount of cash in hand which is not less than the sum of the following percentages calculated on the average of the basic liabilities classified by term and assessed in the preceding week:
- (a) 3% of call liabilities;
 - (b) 2% of liabilities up to three months excluding call liabilities; and
 - (c) 1% of liabilities beyond three months.
30. A credit institution should also maintain liquidity ratios (or funds available ratios) of not less than the following percentages at all times¹⁴:
- (a) 28% for one-month liquidity ratio (i.e. the percentage of a credit institution's funds available to its liabilities maturing within one month); and
 - (b) 33% for three-month liquidity ratio (i.e. the percentage of a credit institution's funds available to its liabilities maturing within three months);
31. Moreover, a credit institution participating directly in settlement should, for the purpose of managing its intra-day, overnight or longer-term liquidity hold within

¹⁴ The liquidity ratios should be calculated and reporting according to the AMCM's related requirements.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

its stock of high-quality liquid assets an appropriate amount of monetary bills that are eligible for repurchase transactions with the AMCM. On the other hand, a credit institution which is active in providing clearing or settlement services to others in the payments systems should have regard to the potential risks associated with such agency arrangements.

Liquidity Coverage Ratio (LCR)

32. The LCR represents the percentage of the total weighted amount of a credit institution's high-quality liquid assets to the total weighted amount of its total net cash outflows over 30 calendar days, which applies to a credit institution designated as a Category 1 Institution (refer to *Appendix 2* for the AMCM's approach on the designation of Category 1 and Category 2 Institutions). It provides an indication of whether the institution can set aside enough high-quality liquid assets to get it through the early stages of a financial crisis. A Category 1 Institution is encouraged to also consult relevant Basel papers (i.e. those in relation to the LCR)¹⁵ for detailed guidance on the principles regarding the application and calculation of the LCR.
33. A Category 1 Institution should maintain an LCR of not less than 100% at all times, which requires the institution to always have sufficient high-quality liquid assets to cover its total net cash outflows over 30 calendar days under stressed conditions. A Category 1 Institution should report its LCR result to the AMCM on a monthly basis, or more frequently as may be required, by using the standardised return template provided by the AMCM and following the completion instructions established with the template¹⁶.
34. In order to ensure that the LCR requirement can be introduced without material disruption to the orderly strengthening of the banking system or the ongoing financing of economic activity, a gradual approach is applied as below:

Minimum Requirement of the LCR	From 1 st January 2026	From 1 st January 2027	From 1 st January 2028	From 1 st January 2029	From 1 st January 2030
for a Category 1 Institution	60%	70%	80%	90%	100%

35. For a Category 2 Institution whose total asset size exceeds MOP 200 billion as at the reporting date or satisfies other qualitative criteria to become a Category 1 Institution for the first time, the institution will be granted a grace period of 3 months to prepare for the full compliance of the LCR requirement. Meanwhile, the institution should still be subject to the requirement of the HQLAAR

¹⁵ https://www.bis.org/basel_framework/standard/LCR

¹⁶ Refer to *Appendix 3* for a summary of relevant items and assigned weights for the calculation and reporting of the LCR.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

indicated in paragraphs 36 to 38 below within the grace period. Once the institution has become a Category 1 Institution, regardless of whether the institution continues to meet any of the conditions that previously prompted its classification as a Category 1 Institution later on, the institution should still be designated as a Category 1 Institution and subject to the LCR requirement, unless otherwise stated by the AMCM.

High-Quality Liquid Assets Adequacy Ratio (HQLAAR)

36. The HQLAAR serves as a simplified version of the LCR with the same regulatory purpose, which only applies to a credit institution designated as a Category 2 Institution.
37. A Category 2 Institution, which is a locally incorporated credit institution, should maintain an HQLAAR of not less than 100% at all times, which requires the institution to always have sufficient high-quality liquid assets to cover its total net cash outflows over 30 calendar days under stressed conditions. Though the abovementioned minimum HQLAAR is not applicable to a Category 2 Institution which is a branch of overseas incorporated credit institution, it should still regularly calculate and monitor its HQLAAR. A Category 2 Institution should report its HQLAAR result to the AMCM on a monthly basis, or more frequently as may be required, by the using the standardised return template provided by the AMCM and following the completion instructions established with the template¹⁷.
38. Similar to the gradual approach applied to the LCR requirement indicated in paragraph 34 above, a gradual approach is also applied to the requirement of HQLAAR as below:

Minimum Requirement of the HQLAAR	From 1 st January 2026	From 1 st January 2027	From 1 st January 2028	From 1 st January 2029	From 1 st January 2030
for a Category 2 Institution which is a locally incorporated credit institution	60%	70%	80%	90%	100%

Net Stable Funding Ratio (NSFR)

39. The NSFR represents the percentage of the amount of a credit institution's "available stable funding" to the amount of its "required stable funding", which applies to a credit institution designated as a Category 1 Institution. This requires the institution to maintain a stable funding profile in relation to its on-

¹⁷ Refer to *Appendix 4* for a summary of relevant items and assigned weights for the calculation and reporting of the HQLAAR.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

and off-balance sheet activities, thus reducing the likelihood that disruptions to a credit institution's regular sources of funding will erode its liquidity position in a way that could increase the risk of its failure and potentially lead to broader systemic stress. A Category 1 Institution is encouraged to also consult relevant Basel papers (i.e. those in relation to the NSFR)¹⁸ for detailed guidance on the principles regarding the application and calculation of the NSFR.

40. A Category 1 Institution should maintain an NSFR of not less than 100% at all times, which requires the institution to always have sufficient available stable funding to support the required stable funding for its assets and off-balance sheet activities over a one-year time horizon. A Category 1 Institution should report its NSFR result to the AMCM on a quarterly basis, or more frequently as may be required, by using the standardised return template provided by the AMCM and following the completion instructions established with the template¹⁹.
41. Similar to the gradual approach applied to the LCR requirement indicated in paragraph 34 above, a gradual approach is also applied to the NSFR requirement as below:

Minimum Requirement of the NSFR	From 1 st January 2026	From 1 st January 2027	From 1 st January 2028	From 1 st January 2029	From 1 st January 2030
for a Category 1 Institution	60%	70%	80%	90%	100%

42. For a Category 2 Institution whose total asset size exceeds MOP 200 billion as at the reporting date or satisfies other qualitative criteria to become a Category 1 Institution for the first time, the institution will be granted a grace period of 3 months to prepare for the full compliance of the NSFR requirement. Once the institution has become a Category 1 Institution, regardless of whether the institution continues to meet any of the conditions that previously prompted its classification as a Category 1 Institution, the institution should still be designated as a Category 1 Institution and subject to the NSFR requirement, unless otherwise stated by the AMCM.

Contractual Maturity Mismatch Analysis

43. Contractual maturity mismatch analysis is an appropriate tool for monitoring a credit institution's capability in managing its day-to-day liquidity needs and ensuring that it can meet its obligations when they fall due. It helps identify the gaps between a credit institution's contractual inflows and outflows based on their respective maturities for defined time bands. Such maturity gaps indicate

¹⁸ https://www.bis.org/basel_framework/standard/NSF

¹⁹ Refer to *Appendix 5* for a summary of relevant items and assigned weights for the calculation and reporting of the NSFR.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

how much liquidity a credit institution would potentially need to raise in each of these time bands if all outflows occurred at the earliest possible date.

44. A credit institution should track the contractual maturity dates of its cash inflows and outflows over various defined time bands and perform contractual maturity mismatch analysis, which allows the credit institution to assess the potential liquidity risk that may arise if liabilities fall due before the corresponding assets can be liquidated or converted into cash, aiming to maintain sufficient liquidity buffers to meet its obligations.
45. A credit institution should regularly monitor the mismatch of contractual terms for both on-balance sheet and off-balance sheet items at different time periods, to analyse the impact on liquidity risk. The analysis and monitoring of the mismatch of contractual terms should cover multiple time periods, including overnight, 7 days, 14 days, 1 month, 2 months, 3 months, 6 months, 9 months, 1 year, 2 years, 3 years, 5 years and more than 5 years.
46. A credit institution should establish prudent mismatch limits to control the size of its cumulative net mismatch positions (i.e. where cumulative cash inflows are exceeded by cumulative cash outflows) as identified under the maturity mismatch analysis which takes account of both contractual maturities as well as behavioural assumptions at various selected time bands. These mismatch limits should be realistic and commensurate with the bank's funding capacity. Examples of the limits to be set include maximum mismatch for individual time bands and limits on the cumulative net mismatch as a percentage of total liabilities over particular periods such as next day, next 7 days, next month, etc.
47. A credit institution should report the result of its contractual maturity mismatch analysis to the AMCM on a quarterly basis, or more frequently as may be required, by using the standardised return template provided by the AMCM and following the completion instructions established with the template.

Liabilities Diversification

48. A credit institution should seek to maintain a diversified and stable funding base. This can be achieved by establishing a policy limiting the concentration in funding sources to avoid excessive reliance on any one counterparty (including related counterparties), product or market as well as by building strong and lasting relationships with depositors and other liability holders. A credit institution should also undertake appropriate analysis on the pattern of their liabilities and the potential impact this may have on their liquidity position (e.g. to detect any signs that the deposit base is becoming more volatile).



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Loan to Deposit Ratio and Other Liquidity Indicators

49. The loan to deposit ratio provides a simple measure of the extent to which a credit institution is funding its illiquid assets (such as loans) by relatively short-term liabilities (such as customer deposits). It provides an indication of over-expansion in the loan book and of the extent to which a credit institution's liquidity is vulnerable to impairment in asset quality. A credit institution should establish internal guidelines on the level of the loan to deposit ratio that is appropriate to its business.
50. Apart from loan to deposit ratio, a credit institution may use other appropriate indicators, such as the following ratios, to further measure liquidity:
- (a) Liquid assets / Liquid liabilities;
 - (b) Assets contractually due to mature in one month / Liabilities contractually due to mature in one month;
 - (c) Total money market takings / Total deposits;
 - (d) Total money market placements / Total deposits;
 - (e) Total liquid assets / Total deposits + Money market takings;
 - (f) Total liquid assets / Total deposits + Money market takings + Total off-balance-sheet obligation;
 - (g) Total liquid assets / Large deposits + Money market takings; and
 - (h) Total liquid assets / Large deposits + money market takings + Total off-balance-sheet obligation.

The assumptions and their basis and the indicators used should be outlined in the liquidity management policy. The credit institution may need to effect remedial action if the ratio for a period varies considerably from the existing trend.

Money Market Access

51. The ability to obtain funds in the interbank and other wholesale markets is an important source of liquidity for a credit institution in both normal and crisis conditions. However, a credit institution should recognise that its ability to access funds from these markets may be radically reduced or delayed in crisis conditions.
52. A credit institution should estimate its "normal" borrowing capacity in the wholesale markets and establish a policy regarding dealing in markets against that capacity. A credit institution making unusual demands on the wholesale markets may face difficulties due to the exposure limits set by counterparties.
53. A credit institution may maintain standby credit lines with other credit institutions or counterparties as a potential source of liquidity. A credit institution should recognise that its right to draw on these facilities may be denied in a crisis or there might be calls for early repayment of drawings under



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

these facilities triggered by events of default or breaches of any material adverse change clauses. In formulating standby arrangements, a credit institution should ensure that the facilities are fully committed and irrevocable. Where standby facilities form an integral element of a credit institution's crisis liquidity management, the AMCM will seek to be satisfied as to the certainty of these arrangements.

Liquidity in Individual Currencies

54. A credit institution should establish a policy on managing their liquidity risk in different currencies. A credit institution with active involvement in multiple currencies and/or with significant positions in specific foreign currencies should address the procedures for liquidity measurement and management of these individual currencies in its strategy. The credit institution should assess the convertibility of individual currencies, the timing of access to funds, and the impact of potential disruptions to foreign exchange markets and exchange risks before presuming that surplus liquidity in one currency can be used to meet the shortfall in another currency. The credit institution should have in place backup liquidity procedures for circumstances in which normal access to funding in individual currencies is disrupted.
55. A Category 1 Institution should establish internal limits for its LCR in individual currencies²⁰. Such limits should be set having regard to relevant factors such as the transferability of liquidity in different currencies. By focusing on individual currencies, the institution can manage and mitigate the specific liquidity risks associated with each currency, preventing potential currency mismatches that could jeopardize its liquidity position.

Monitoring and Control of Liquidity Position

56. A credit institution should have ongoing processes for the monitoring and control of its liquidity position and for conducting stress tests. Adequate and timely information should be provided to the Board, senior management and other appropriate personnel for monitoring, controlling and reporting purposes. Internal control activities and review of adherence to in-house liquidity management policies, procedures and limits should also be conducted on an on-going basis.

Management Information Systems

57. A credit institution should put in place a management information system capable of measuring, assessing and reporting liquidity to senior management

²⁰ Internal LCR limits should at least be established for any significant foreign currency (except for HKD) if a credit institution's liabilities denominated in that currency account for 5% or more of its total liabilities.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

and the ALCO, if applicable, on a regular basis. While the sophistication of a credit institution's management information system will depend on the nature and complexity of the credit institution's operations, the system should produce timely, accurate and relevant information for managing and monitoring the liquidity positions of a credit institution in all operating circumstances and for the making of sound, effective and timely decisions by management and the ALCO. In addition to the information necessary for the measurement of liquidity position as discussed under paragraphs 25 to 55 above, the management information system should at a minimum be able to:

- (a) report the composition and market values of a credit institution's liquidity holdings;
- (b) calculate and monitor a credit institution's liquidity position in all of the currencies in which the credit institution conducts business both on a subsidiary/ branch basis in all jurisdictions in which the credit institution is active and on an aggregate group basis;
- (c) calculate and monitor a credit institution's liquidity position on an intraday basis and on a day-to-day basis for shorter time horizons (of, say, 7 days ahead), as well as over a series of more distant time periods thereafter;
- (d) capture all sources of a credit institution's liquidity risk, including contingent risks and the related triggers and those arising from new activities, with the ability to deliver more granular and time sensitive information during stress events;
- (e) provide analysis on the pattern of liabilities and other liquidity indicators as well as their potential impact on liquidity position;
- (f) construct maturity profiles of a credit institution's cash flows to identify cumulative net funding positions at selected maturity date;
- (g) monitor high-quality liquid assets, other unencumbered assets and collaterals involved. Contents should include but are not limited to classification, quantity, currency, location and custody account;
- (h) set out the behavioural assumptions and limitations underlying the cash flow reports and scenario analyses;
- (i) support the implementation of stress testing under different scenarios;
- (j) calculate, project, monitor and control various limits and ratios in relation to liquidity for both statutory and internal risk management purposes; and
- (k) check compliance with established liquidity policies and limits and generate exception reports.

Regular Review of Liquidity Management Information

58. A credit institution's senior management should ensure that the credit institution's liquidity management information is reviewed on a regular basis. Taking the opportunity of the reviews, the credit institution's liquidity policies and practices could be refined in the light of its liquidity experience and business



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

developments. The reviews may include frequent routine liquidity reviews and in-depth reviews that are less frequent. Where appropriate, the monitoring and review should cover:

- (a) the maturity profiles of the credit institution's cash flows;
- (b) the stock of liquid assets available to the credit institution and their market values;
- (c) concentration in sources and application of funds;
- (d) the ability to borrow in various markets;
- (e) intra-group cash flows and the accessibility of intra-group funding;
- (f) the potential sources of volatility in assets and liabilities, including claims and obligations arising from off-balance-sheet business;
- (g) the credit standing and capacity of providers of standby facilities to meet their obligations;
- (h) the impact of market / operational disruptions on cash flows and on customers;
- (i) the impact of adverse trends in asset quality on future cash flows and market confidence in the credit institution; and
- (j) the ability to undertake asset sales in various markets.

Stress Testing

59. A credit institution should perform stress tests or scenario analysis on a regular basis to analyse the impact of stress scenarios on its liquidity positions. The results of the tests should form the basis for taking remedial or mitigating actions to limit the credit institution's exposures, build up a liquidity cushion and subject its liquidity profile to fit its tolerance. The results of stress tests should also play a key role in shaping the credit institution's contingency funding planning and in determining the strategy and tactics to deal with events of liquidity stress.
60. The extent and frequency of stress testing should be commensurate with the size of the credit institution and its liquidity risk exposures. In an institution-specific crisis scenario (i.e. scenario triggered by internal problems of the credit institution as against external or market-related problems), there may be significant run-off of deposits, increasing requests from depositors to redeem deposits before maturity and, difficulties to roll over or replace liabilities. The following questions should be considered when making assumptions for stress testing:
- (a) which sources of funding are likely to stay with the credit institution under any circumstance, and can these be increased?
 - (b) which sources of funding can be expected to run off gradually if problems arise, and at what rate? Is deposit pricing a means of controlling the run-off rate?



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

- (c) which maturing liabilities or liabilities with non-contractual maturities can be expected to run off immediately at the first sign of problems? Are there liabilities with early withdrawal options that are likely to be exercised?
 - (d) whether the accelerated loss of funding due to digital banking services and widespread access to social media is fully considered under the liquidity crisis?
 - (e) does the credit institution have back-up facilities that it can draw down and under what circumstances?
61. In addition to institution-specific crisis scenarios as mentioned in paragraph 60 above, a credit institution should also consider market-wide stress scenarios and a combination of both in its stress tests, including short term and protracted stress scenarios. The credit institution should assign the timing of cash flows for each type of asset and liabilities, including off-balance sheet and contingent items by assessing the probability of the behaviours of those cash flows under different scenarios. These scenarios include, for example:
- (a) a simultaneous drying up of market liquidity in several previously highly liquid markets;
 - (b) severe constraints in accessing secured and unsecured funding;
 - (c) restrictions on currency convertibility; and
 - (d) severe operational or settlement disruptions affecting one or more payment or settlement systems.
62. A credit institution should take a conservative approach when setting stress testing assumptions and assessing the future behaviour of cash flows and their expected maturities. Significant judgement is involved in making assumptions, which vary for each credit institution. When making assumptions on future cash flows, a credit institution should at a minimum determine:
- (a) the proportion of maturing assets and liabilities that the credit institution will rollover or renew;
 - (b) the expected growth level of new loans and deposits;
 - (c) the behaviour of assets and liabilities that have uncertain maturity dates (e.g. overdrafts, call deposits and those assets/liabilities that have early withdrawal options);
 - (d) the behaviour of interest rates for assets and liabilities;
 - (e) the potential cash flows from off-balance-sheet activities, including drawdowns under loan commitments, contingent liabilities and market-related transactions;
 - (f) the access to standby facilities, interbank money market and intra-group funding; and
 - (g) the convertibility of foreign currencies.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

An illustrative list of stress testing assumptions, which is extracted from the Basel Paper, is also given at *Appendix 6* for reference.

63. A credit institution should demonstrate that it can meet its obligations and commitments and that there is sufficient liquidity available to keep it operating for a certain minimum stress period under each of the stress scenarios. More specifically, a credit institution should assume the minimum stress period for an institution-specific stress scenario to last for no less than 7 days, and that for a market-wide stress scenario and a combined stress scenario to last for no less than 1 month.

Internal Controls

64. As an integral part of a credit institution's internal controls, there should be regular independent reviews and evaluations of the effectiveness of the liquidity risk management process. When revisions or enhancements to internal controls are warranted, there should be a mechanism in place to ensure that these are implemented in a timely manner.
65. From the periodic review, a credit institution should determine whether it complies with its liquidity risk policies and procedures. Positions that exceed established limits should receive the prompt attention of appropriate management and should be resolved according to the established policies. The internal audit function should also periodically review the liquidity management process in order to identify any weaknesses or problems.

Contingency Funding Planning (CFP)

66. Either within its liquidity management policy or separately, a credit institution is expected to have a CFP covering the eventuality of it experiencing severe disruptions to its ability to fund some or all of its activities in a timely manner and at a reasonable cost. The CFP should set out clearly the strategies for addressing liquidity shortfalls in emergency situations. It should also outline policies to manage a range of stress environments, establish clear lines of responsibility, include clear invocation and escalation procedures and be regularly tested and updated to ensure that it is operationally robust. Among other things, the key elements of a CFP should include:
- (a) early warning indicators, including the impact of external events not directly related to the financial condition of the credit institution;
 - (b) contingency procedures and roles and responsibilities;
 - (c) communication plans; and
 - (d) review and testing.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Early Warning Indicators

67. The purpose of early warning indicators is to alert management to the possibility of an impending liquidity crisis so that action can be taken quickly and early enough to avert it. Examples of such indicators may include:

Market Indicators

- (a) credit rating downgrades;
- (b) persistent drop in the credit institution's share price;
- (c) widened spread on the credit institution's senior and subordinated debts;
- (d) non-renewal or reduction in available credit lines from correspondent credit institutions; and
- (e) counterparties unwilling to extend unsecured or longer dated transactions.

Liability Indicators

- (f) unexpected and significant levels of withdrawals of retail deposits;
- (g) core retail deposit volumes falling below projected levels; and
- (h) a shortening of deposit maturities and a rise in requests to break fixed term deposits.

Asset Indicators

- (i) retail advances growing faster than projected;
- (j) a lengthening of loan maturities;
- (k) larger than expected drawdown of committed facilities;
- (l) a significant rise in undrawn committed facilities;
- (m) a rise in defaults and delinquencies; and
- (n) prepayments of loan facilities falling below historic behavioural norms.

68. The monitoring of these indicators should be part of normal liquidity monitoring procedures. The CFP should call for a series of predetermined responses in the event of any of the defined early warning indicators signalling the approach of an impending liquidity crisis. The aim of the plan should be to restore adequate liquidity for the current circumstances as soon as possible, while at the same time avoiding any unnecessary overreaction or negative publicity that could aggravate the problem.

Contingency Procedures and Roles and Responsibilities

69. A credit institution's CFP should contain clear policies and procedures that will enable the credit institution's management to make timely and well-informed decisions, execute contingency measures swiftly and proficiently, and communicate effectively to implement the plan efficiently. There should be clear



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

specification of roles and responsibilities, including the authority to invoke the CFP. The CFP should also set out clear decision making process and/or actions to be taken, such as:

- (a) what actions to take at what time;
- (b) who can take the actions;
- (c) what issues need to be escalated to more senior levels in the credit institution;
- (d) who should be notified;
- (e) what reports need to be produced and for whom; and
- (c) what are the steps that can be taken to improve liquidity or to make up cash flows, for example:
 - (i) raising retail deposit interest rates;
 - (ii) raising loan interest rates to discourage new borrowings and stabilize the balance sheet;
 - (iii) realizing liquid assets including outright sales, or sales under repurchase agreements of marketable assets;
 - (iv) drawdown of committed facilities;
 - (v) funding from other group entities;
 - (vi) capping balance sheet growth;
 - (vii) increasing advertising; and
 - (viii) issuing public statements (both locally and internationally).

70. Effective management of a liquidity crisis can only be achieved if responsibilities are clearly defined in advance. The key aspects are:

- (a) there should be a single source of authority on critical matters;
- (b) for Macao incorporated credit institutions, the treasury function should, in crisis circumstances, report directly to the Board or to any designated person / committee that will in turn report to the Board;
- (c) each member of staff involved with liquidity management should be issued with explicit written instructions on how to proceed if any of the early warning indicators triggers a need for action;
- (d) clear lines of communication should be established and senior management with defined responsibilities should be issued with clear guidance on what is expected of them in the event of a crisis; and
- (e) All senior and executive management should have a copy of the CFP.

Communication Plans

71. A credit institution should develop communication plans that will deliver timely, clear, consistent and frequent communication to internal as well as external parties such as the AMCM or system operators in a time of stress, to support the general confidence in the credit institution. The plan should also address when and how to communicate with correspondents, custodians, counterparties and customers, as the actions of these parties could significantly affect the credit



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

institution's liquidity position and may vary with the underlying source of a problem.

Review and Testing

72. A credit institution should review, test and update its CFP regularly (at least annually) to ensure that it remains robust over time and reflects the credit institution's changing operating circumstances. The key aspects of testing include ensuring that roles and responsibilities are appropriate and understood, confirming that contact information is up to date, proving the transferability of cash and collateral and reviewing that the necessary legal and operational documentation is in place to execute the CFP at short notice. The credit institution should review all aspects of the CFP following each testing exercise and ensure that follow up actions are delivered. Adequate procedures should be in place to ensure relevant staff members (including those nominated as back-ups) involved in the implementation of the CFP are well-informed of their roles under the CFP and of any subsequent changes.

Public Disclosure

73. A credit institution should on a regular basis disclose sufficient information regarding its liquidity risk management to enable relevant stakeholders to make an informed judgement about the ability of the credit institution to meet its liquidity needs. The information to be disclosed include, for example, the organizational structure and framework for the management of liquidity risk; the quantitative information about its liquidity position; and any other qualitative information that provides market participants with further insight into how it manages liquidity risk. Reference can be made to the AMCM's "Guideline on Disclosure of Financial Information" for the minimum information to be disclosed.

Oversight by the AMCM

74. During the course of its supervision, the AMCM will review the liquidity management policies of credit institutions to assess the adequacy of their risk management strategy. The AMCM will monitor the level and trends of credit institution's liquidity positions through their submission of returns and management information.
75. The AMCM will also conduct on-site examinations to assess each credit institution's compliance with the requirements of this Guideline and whether management has effectively implemented the liquidity management policies and



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

processes. In the event of a systemic liquidity crisis, the AMCM will liaise closely with each credit institution.

76. The AMCM may require a credit institution that it has particular concern to provide to it liquidity returns and reports on a more frequent basis and in a more detailed scope. Such credit institution will be informed of the additional submissions in writing by the AMCM. In case of need, the credit institution will be required to take prompt remedial actions. Depending on the circumstances of each case, the AMCM may take supervisory measures such as setting higher minimum liquidity requirements or requiring the credit institution to reposition its asset portfolios to reduce liquidity risk.
77. The AMCM may from time to time introduce new liquidity standards or other supervisory requirements to enhance credit institutions' liquidity risk management framework.

~ End ~



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Appendix 1

Principles for Sound Liquidity Risk Management and Supervision

(Extracted from the Basel Committee's paper of September 2008 - "Principles for Sound Liquidity Risk Management and Supervision")

Fundamental principle for the management and supervision of liquidity risk

Principle 1: A bank is responsible for the sound management of liquidity risk. A bank should establish a robust liquidity risk management framework that ensures it maintains sufficient liquidity, including a cushion of unencumbered, high quality liquid assets, to withstand a range of stress events, including those involving the loss or impairment of both unsecured and secured funding sources.

Governance of liquidity risk management

Principle 2: A bank should clearly articulate a liquidity risk tolerance that is appropriate for its business strategy and its role in the financial system.

Principle 3: Senior management should develop a strategy, policies and practices to manage liquidity risk in accordance with the risk tolerance and to ensure that the bank maintains sufficient liquidity. Senior management should continuously review information on the bank's liquidity developments and report to the board of directors on a regular basis. A bank's board of directors should review and approve the strategy, policies and practices related to the management of liquidity at least annually and ensure that senior management manages liquidity risk effectively.

Principle 4: A bank should incorporate liquidity costs, benefits and risks in the internal pricing, performance measurement and new product approval process for all significant business activities (both on- and off-balance sheet), thereby aligning the risk-taking incentives of individual business lines with the liquidity risk exposures their activities create for the bank as a whole.

Measurement and management of liquidity risk

Principle 5: A bank should have a sound process for identifying, measuring, monitoring and controlling liquidity risk. This process should include a robust framework for comprehensively projecting cash flows arising from assets, liabilities and off-balance sheet items over an appropriate set of time horizons.

Principle 6: A bank should actively monitor and control liquidity risk exposures and funding needs within and across legal entities, business lines and currencies, taking into account legal, regulatory and operational limitations to the transferability of liquidity.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Principle 7: A bank should establish a funding strategy that provides effective diversification in the sources and tenor of funding. It should maintain an ongoing presence in its chosen funding markets and strong relationships with funds providers to promote effective diversification of funding sources. A bank should regularly gauge its capacity to raise funds quickly from each source. It should identify the main factors that affect its ability to raise funds and monitor those factors closely to ensure that estimates of fund raising capacity remain valid.

Principle 8: A bank should actively manage its intra-day liquidity positions and risks to meet payment and settlement obligations on a timely basis under both normal and stressed conditions and thus contribute to the smooth functioning of payment and settlement systems.

Principle 9: A bank should actively manage its collateral positions, differentiating between encumbered and unencumbered assets. A bank should monitor the legal entity and physical location where collateral is held and how it may be mobilised in a timely manner.

Principle 10: A bank should conduct stress tests on a regular basis for a variety of short-term and protracted institution-specific and market-wide stress scenarios (individually and in combination) to identify sources of potential liquidity strain and to ensure that current exposures remain in accordance with a bank's established liquidity risk tolerance. A bank should use stress test outcomes to adjust its liquidity risk management strategies, policies, and positions and to develop effective contingency plans.

Principle 11: A bank should have a formal contingency funding plan (CFP) that clearly sets out the strategies for addressing liquidity shortfalls in emergency situations. A CFP should outline policies to manage a range of stress environments, establish clear lines of responsibility, include clear invocation and escalation procedures and be regularly tested and updated to ensure that it is operationally robust.

Principle 12: A bank should maintain a cushion of unencumbered, high quality liquid assets to be held as insurance against a range of liquidity stress scenarios, including those that involve the loss or impairment of unsecured and typically available secured funding sources. There should be no legal, regulatory or operational impediment to using these assets to obtain funding.

Public disclosure

Principle 13: A bank should publicly disclose information on a regular basis that enables market participants to make an informed judgement about the soundness of its liquidity risk management framework and liquidity position.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Appendix 2

Designation of Category 1 and Category 2 Institutions

1. Recognizing the diverse nature, size, and complexity of credit institutions' business operations, the AMCM deems it appropriate to implement liquidity requirements that are proportionate to the specific characteristics of different types of credit institutions. This tailored approach ensures that the liquidity requirements are commensurate with the unique attributes and risk profiles of each type of credit institutions, fostering a more effective and risk-sensitive regulatory framework.
2. Based on the principle of proportionality, the AMCM categorises the credit institutions into two groups: Category 1 and Category 2 Institutions. This Appendix sets out the AMCM's approach on the designation of Category 1 and Category 2 Institutions.

Category 1 Institutions

3. The AMCM may designate a credit institution as a Category 1 Institution if it satisfies any of the following conditions:
 - (a) the total asset size (net of provisions) of the credit institution exceeds MOP 200 billion;
 - (b) the credit institution is significant to the banking system in Macao, based on factors such as the level of its local and international exposures and its role or level of participation in the financial markets (e.g. banknote issuing); or
 - (c) the credit institution voluntarily applies to be categorized as a Category 1 Institution and receives approval from the AMCM. In such case, the credit institution should provide reasonable justification for being categorized as a Category 1 Institution and should show its capacity to comply with all the requirements applicable to Category 1 Institutions.
4. Whilst the AMCM expects that in most cases the indicators and benchmarks referred to in paragraph 3 of this Appendix will be sufficient to make the assessment, there may still be cases where a credit institution's satisfaction of the conditions specified above can only be observed by reference to other factors. In such cases, the AMCM will discuss the rationale behind the designation with the credit institution concerned.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Category 2 Institutions

5. A credit institution not designated as a Category 1 Institution is automatically designated as a Category 2 Institution.
6. A Category 2 Institution is required to notify the AMCM promptly if it anticipates any material changes in its business plans, operational circumstances or any other factors that may cause it to become a Category 1 Institution.



Summary of LCR Items and Assigned Weights

A. HQLA	
Weight	Items
1. Level 1 Assets	
100%	Coins and banknotes
	Withdrawable central bank reserves
	Qualifying marketable debt securities issued or guaranteed by sovereigns, central banks, PSEs, MDBs or relevant international organizations with a 0% risk weight
	For non-0% risk-weighted sovereigns, sovereign or central bank debt securities issued by the sovereign or its central bank in the jurisdiction in which the liquidity risk is being taken ¹⁸ or in the credit institution's home jurisdiction
2. Level 2A Assets	
85%	Qualifying marketable debt securities issued or guaranteed by sovereigns, central banks, PSEs, MDBs or relevant international organizations with a risk weight of 20% or lower, which do not qualify as level 1 assets
	Qualifying marketable debt securities (including commercial paper) issued by non-financial corporates and covered bonds, with a credit rating of at least AA- or equivalent
3. Level 2B Assets	
50%	Qualifying marketable debt securities issued by sovereigns, central banks, PSEs, MDBs or relevant international organizations with a credit rating of at least BBB- or equivalent, which do not qualify as level 1 or level 2A assets
	Qualifying marketable debt securities (including commercial paper) issued by non-financial corporates with a credit rating of at least BBB- or equivalent, which do not qualify as level 2A assets
	Qualifying common equity shares
B. Total Expected Cash Outflows	
Weight	Items
1. Retail Deposits²¹	

²¹ Retail deposits refer to deposits placed by a natural person.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

3%	Stable retail deposits that can meet the additional criteria for deposit insurance schemes ²² (including those insured by the Deposit Insurance Scheme of Macao)
5%	Stable retail deposits that cannot meet the additional criteria for deposit insurance schemes
10%	Less stable retail deposits
2. Unsecured Wholesale Funding	
2.1 Small Business Funding²³	
3%	Stable small business funding that can meet the additional criteria for deposit insurance schemes (including those insured by the Deposit Insurance Scheme of Macao)
5%	Stable small business funding that cannot meet the additional criteria for deposit insurance schemes
10%	Less stable small business funding
2.2 Operational Deposits²⁴	
3%	Insured operational deposits provided by non-financial corporates (other than small business customers), sovereigns, central banks, PSEs, MDBs, relevant international organizations and other banks, financial institutions or legal entities that can meet the additional criteria for deposit insurance scheme (including those insured by the Deposit Insurance Scheme of Macao)
5%	Insured operational deposits provided by non-financial corporates (other than small business customers), sovereigns, central banks, PSEs, MDBs, relevant international organizations and other banks, financial institutions or legal entities that cannot meet the additional criteria for deposit insurance scheme
25%	Uninsured operational deposits provided by non-financial corporates (other than small business customers), sovereigns, central banks, PSEs, MDBs, relevant international organizations and other banks, financial institutions or legal entities

²² The additional criteria includes: a) the insurance scheme is based on a system of prefunding via the periodic collection of levies on credit institutions with insured deposits; b) the scheme has adequate means of ensuring ready access to additional funding in the event of a large call on its reserves, e.g. an explicit and legally binding guarantee from the government, or a standing authority to borrow from the government; and c) access to insured deposits is available to depositors in a short period of time once the deposit insurance scheme is triggered.

²³ Small business funding refers to funding provided by small business customers. A small business customer refers to a business entity (on a group basis where applicable) that can satisfy all of the following requirements: a) the customer has provided the credit institution with a total aggregated funding of not more than MOP 10 million (or the equivalent in foreign currencies) on the reporting date; b) the credit institution has a total credit exposure of not more than MOP 10 million (or the equivalent in foreign currencies) to the customer on the reporting date; and c) where the exposure to the customer is managed by the credit institution as a retail exposure, or where the credit institution does not have any exposure to the customer, the funding provided by the customer is managed by the credit institution as a retail deposit.

²⁴ Operational deposits refer to those deposits placed by a wholesale customer (other than a small business customer) with the credit institution in the course of the credit institution's provision of operational services (i.e. clearing, custody or cash management services), on which the customer has become significantly dependent for its business operation.



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

2.3 Other Unsecured Wholesale Funding (Other Than Operational Deposits)	
20%	Insured funding provided by non-financial corporates (other than small business customers), sovereigns, central banks, PSEs, MDBs or relevant international organizations
40%	Uninsured funding provided by non-financial corporates (other than small business customers), sovereigns, central banks, PSEs, MDBs or relevant international organizations
25%	Non-operational deposits provided by members of the institutional networks of cooperative (or otherwise named) banks
100%	Non-operational deposits provided by other banks, financial institutions or legal entities
2.4 Debt Securities and Prescribed Instruments	
100%	Debt securities and prescribed instruments issued
3. Secured Wholesale Funding	
0%	Secured funding transaction of which the counterparty is the central bank of the jurisdiction in which the credit institution is incorporated or the transaction is backed by level 1 assets
15%	Secured funding transaction backed by level 2A assets
25%	Secured funding transaction backed by level 2B or other assets of which the counterparty is a domestic sovereign, domestic PSE, MDB or relevant international organization with a risk weight of 20% or lower
50%	Secured funding transaction backed by level 2B assets of which the counterparty is not a domestic sovereign, domestic PSE, MDB or relevant international organization with a risk weight of 20% or lower
100%	Secured funding transaction backed by other assets of which the counterparty is not a domestic sovereign, domestic PSE, MDB or relevant international organization with a risk weight of 20% or lower
4. Additional Requirements	
5%	Committed credit and liquidity facilities to retail and small business customers
10%	Committed credit facilities to non-financial corporates, sovereigns, central banks, PSEs, MDBs or relevant international organizations
20%	Increased liquidity needs related to the potential for valuation changes on posted collateral securing derivative and other transactions (collateral that are not level 1 assets)
30%	Committed liquidity facilities to non-financial corporates, sovereigns, central banks, PSEs, MDBs or relevant international organizations
40%	Committed credit and liquidity facilities to banks and committed credit facilities to other financial institutions
100%	Derivatives net cash outflows



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

	<p>Increased liquidity needs related to:</p> <ul style="list-style-type: none"> - downgrade triggers in derivatives and other financing transactions - excess non-segregated collateral held that could contractually be called at any time by the counterparty - contractually required collateral on transactions for which the counterparty has not yet demanded the collateral be posted - contracts that allow collateral substitution to non-HQLA assets - market valuation changes on derivative or other transactions that are subject to collateral requirements
	<p>Loss of funding on:</p> <ul style="list-style-type: none"> - asset-backed securities, covered bonds and other structured financing instruments issued - asset-backed commercial papers, conduits, securities investment vehicles and other such financing facilities
	Committed liquidity facilities to other financial institutions and other legal entities
	Other contractual obligations to extend funds to financial institutions and other customers
5. Other Contingent Funding Obligations	
0%	Unconditionally revocable uncommitted credit and liquidity facilities
3%	Trade finance-related obligations (including guarantees and letters of credit)
10%	Guarantees and letters of credit unrelated to trade finance obligations
50%	Non-contractual obligations where customer short positions are covered by other customers' collateral
100%	Other non-contractual obligations
	Other contractual cash outflows
C. Total Expected Cash Inflows	
Weight	Items
1. Secured Lending Transactions	
0%	Secured lending transactions of which collateral obtained from the counterparty is re-used to cover outright short positions
	Secured lending transaction backed by level 1 assets
15%	Secured lending transaction backed by level 2A assets
50%	Secured lending transaction backed by level 2B assets and other assets for margin lending transactions
100%	Secured lending transaction backed by other assets
2. Fully Performing Loans	
0%	Operational deposits placed at financial institutions
	Deposits placed at the central institution or the specialised service provider of an institutional network of cooperative banks
50%	Loans extended to retail and small business customers, non-financial corporates (other than small business customers), sovereigns, PSEs, MDBs, relevant international organizations or other legal entities
100%	Loans extended to central banks



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

	Loans extended to and other deposits placed at other financial institutions
3. Other Cash Inflows	
100%	Derivatives net cash inflows
	Maturing securities
50%	Other contractual cash inflows



Summary of HOLAAR Items and Assigned Weights

A. HQLA	
Weight	Items
1. Level 1 Assets	
100%	Coins and banknotes
	Withdrawable central bank reserves
	Marketable debt securities issued or guaranteed by the Government of Macao SAR
	Marketable debt securities issued or guaranteed by the AMCM
	Marketable debt securities issued or guaranteed by other sovereigns, central banks, PSEs, MDBs or relevant international organizations with a 0% risk weight
2. Level 2A Assets	
85%	Marketable debt securities issued or guaranteed by sovereigns, central banks, PSEs, MDBs or relevant international organizations with a risk weight of 20% or lower, which do not qualify as level 1 assets
	Marketable debt securities (including commercial paper) issued by non-financial corporates and covered bonds, with a credit rating of at least AA- or equivalent
3. Level 2B Assets	
50%	Marketable debt securities issued by sovereigns, central banks, PSEs, MDBs or relevant international organizations or MDBs with a credit rating of at least BBB- or equivalent, which do not qualify as level 1 or level 2A assets
	Marketable debt securities issued by non-financial corporates with a credit rating of at least BBB- or equivalent, which do not qualify as level 2A assets
	Qualifying common equity shares
B. Total Expected Cash Outflows	
Weight	Items
1. Customer Deposits	
8%	Retail deposits
	Non-retail deposits taken from small business customers
35%	Non-retail deposits taken from non-financial customers (other than small business customers)
2. Interbank Transactions	
2.1 Deposits	
100%	Deposits from banks and other financial institutions including central banks and MDBs



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

2.2 Borrowing	
0%	Funds borrowed from banks or other financial institutions including central banks and MDBs for settlement purposes
100%	Funds borrowed from banks or other financial institutions including central banks and MDBs for financing purposes
2.3 Repurchase Agreements	
0%	Funds obtained from repurchase agreements backed by level 1 assets
15%	Funds obtained from repurchase agreements backed by level 2A assets
25%	Funds obtained from repurchase agreements backed by level 2B assets
50%	Funds obtained from repurchase agreements backed by other assets
2.4 Certificate of Deposits	
100%	Interbank certificates of deposit issued
3. Debt Securities	
100%	Debt securities issued
4. Other Cash Outflows	
0%	Drawdown on uncommitted facilities
10%	Drawdown on committed facilities
5%	Guarantees and letters of credit provided
100%	Derivatives net cash outflows
	Non-contractual contingent funding obligations
	Other contractual cash outflows
C. Total Expected Cash Inflows	
Weight	Items
1. Loans	
50%	Retail loans
	Non-retail loans to small business customers and non-financial customers (other than small business customers)
	Trade bills
2. Interbank Transactions	
2.1 Placements	
100%	Deposits placed with banks and other financial institutions including central banks and MDBs
2.2 Lending	
0%	Funds lent to banks and other financial institutions including central banks and MDBs for settlement purposes
100%	Funds lent to banks and other financial institutions including central banks and MDBs for financing purposes
2.3 Reverse Repurchase Agreements	
0%	Funds lent from the reverse repurchase agreements backed by level 1 assets
15%	Funds lent from the reverse repurchase agreements backed by level



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

	2A assets
25%	Funds lent from the reverse repurchase agreements backed by level 2B assets
50%	Funds lent from the reverse repurchase agreements backed by other assets
2.4 Certificate of Deposits	
100%	Interbank certificates of deposit invested
3. Securities	
100%	Securities held
4. Other Cash Inflows	
100%	Derivatives net cash inflows
50%	Other contractual cash inflows



Summary of NSFR Items and Assigned Factors

A. ASF	
ASF Factor	Items
100%	Tier 1 and Tier 2 capital, before the application of regulatory deductions, excluding the proportion of Tier 2 instruments with residual maturities of less than one year
	Other capital instruments not included in Tier 1 and Tier 2 capital mentioned above that have effective residual maturities of one year or more
	Term deposits with residual maturities of one year or more that cannot be withdrawn early without paying a penalty that is materially greater than the loss of interest, and are provided by retail and small business customers
	Other secured and unsecured borrowings and liabilities (including term deposits) with effective residual maturities of one year or more
95%	Stable deposits that are demand deposits provided by retail and small business customers
	Stable deposits that are term deposits with residual maturities of less than one year provided by retail and small business customers
	Stable deposits that are term deposits with residual maturities of one year or more that can be withdrawn early without having to pay a penalty that is materially greater than the loss of interest, and are provided by retail and small business customers
90%	Demand deposits provided by retail and small business customers
	Term deposits with residual maturities of less than one year provided by retail and small business customers
	Term deposits with residual maturities of one year or more that can be withdrawn early without having to pay a penalty that is materially greater than the loss of interest, and are provided by retail and small business customers
50%	Operational deposits with residual maturities of less than one year
	Funding (secured and unsecured) with residual maturities of less than one year provided by non-financial corporate customers (other than retail and small business customers), sovereigns, MDBs, international organizations, national development banks and public sector entities
	Other funding (secured and unsecured) with residual maturities of between six months to less than one year, including funding from central banks and financial institutions
0%	Funding with residual maturities of less than six months from central banks and financial institutions



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

	NSFR derivative liabilities (net of NSFR derivative assets, if NSFR derivative liabilities are greater than NSFR derivative assets)
	“Trade date” payables arising from purchases of financial instruments, foreign currencies and commodities
	All other liabilities and equity categories not included above if the effective maturity is less than six months or without a stated maturity
B. RSF	
RSF Factor	Items
0%	Coins and banknotes
	Central bank reserves
	Claims on central banks that are unencumbered or are encumbered for less than six months with residual maturities of less than six months
	Trade date receivables arising from sales of financial instruments, foreign currencies and commodities
	Off-balance sheet exposures including: - unconditionally revocable credit and liquidity facilities - trade finance-related obligations (including guarantees and letters of credit) - guarantees and letters of credit unrelated to trade finance obligations - non-contractual obligations
5%	Level 1 HQLA that are unencumbered or are encumbered for less than six months, excluding assets receiving a 0% RSF factor as specified above
	Irrevocable and conditionally revocable credit and liquidity facilities
10%	Loans to financial institutions that are unencumbered or are encumbered for less than six months with residual maturities of less than six months, where the loan is secured against level 1 HQLA, and where the credit institution has the ability to freely rehypothecate the received collateral for the life of the loan
15%	Level 2A HQLA that are unencumbered or are encumbered for less than six months
	Loans to financial institutions that are unencumbered or are encumbered for less than six months with residual maturities of less than six months, where the received collateral of the loan is not included in unencumbered level 1 HQLA
50%	Level 2B HQLA that are unencumbered or are encumbered for less than six months
	Any HQLA that are encumbered for a period of between six months and less than one year
	Residential mortgages that are unencumbered or are encumbered for less than one year with residual maturities of less than one year



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

	Loans not included in the above categories that are unencumbered or are encumbered for less than one year with residual maturities of less than one year
	Operational deposits placed at other credit institutions that are subject to the 50% ASF factor
	All other non-HQLA not included in the above categories that are encumbered or are unencumbered for less than one year with residual maturities of less than one year
65%	Residential mortgages that are unencumbered or are encumbered for less than one year with residual maturities of one year or more, and would qualify for a risk weight of 35% or lower
	Loans, excluding loans to financial institutions, that are unencumbered or are encumbered for less than one year with residual maturities of one year or more, and would qualify for a risk weight of 35% or lower
85%	Residential mortgages that are unencumbered or are encumbered for less than one year with residual maturities of one year or more, and do not qualify for a risk weight of 35% or lower
	Loans, excluding loans to financial institutions, that are unencumbered or are encumbered for less than one year with residual maturities of one year or more, and do not qualify for a risk weight of 35% or lower
	Securities and listed equities that are unencumbered or are encumbered for less than one year with residual maturities of one year or more, and are not in default and do not qualify as HQLA
	Physical traded commodities, including gold, that are unencumbered or are encumbered for less than one year with residual maturities of one year or more
	Cash, securities or other assets posted as initial margin for derivative contracts and cash or other assets provided to contribute to the default fund of a central counterparty (CCP)
100%	All assets that are encumbered for one year or more
	Loans to financial institutions with residual maturities of one year or more
	NSFR derivative assets (net of NSFR derivative liabilities, if NSFR derivative assets are greater than NSFR derivative liabilities)
	All assets without a stated maturity
	5% of all derivative liabilities (i.e. negative replacement cost amounts, before deducting variation margin posted)
	All other assets not included in the above categories, including non-performing loans, non-listed equities, fixed assets, items deducted from regulatory capital, retained interest, insurance assets, subsidiary interests and defaulted securities



澳門金融管理局
AUTORIDADE MONETÁRIA DE MACAU

Appendix 6

Stress Testing Assumptions

(Extracted from paragraph 103 of the Basel Committee's paper of September 2008 - "Principles for Sound Liquidity Risk Management and Supervision")

A bank should take a conservative approach when setting stress testing assumptions. Based on the type and severity of the scenario, a bank needs to consider the appropriateness of a number of assumptions, potentially including but not limited to the following list. This list is illustrative, as a bank should use assumptions which are relevant to its business.

- asset market illiquidity and the erosion in the value of liquid assets;
- the run-off of retail funding;
- the (un)availability of secured and unsecured wholesale funding sources;
- the correlation between funding markets or the effectiveness of diversification across sources of funding;
- additional margin calls and collateral requirements;
- funding tenors;
- contingent claims and more specifically, potential draws on committed lines extended to third parties or the bank's subsidiaries, branches or head office;
- the liquidity absorbed by off-balance sheet vehicles and activities (including conduit financing);
- the availability of contingent lines extended to the bank;
- liquidity drains associated with complex products/transactions;
- the impact of credit rating triggers;
- FX convertibility and access to foreign exchange markets;
- the ability to transfer liquidity across entities, sectors and borders, taking into account legal, regulatory, operational and time zone restrictions and constraints;
- the access to central bank facilities;
- the operational ability of the bank to monetise assets;
- the bank's remedial actions and the availability of the necessary documentation and operational expertise and experience to execute them, taking into account the potential reputational impact when executing these actions;
- estimates of future balance sheet growth.