



Monetary Authority of Singapore



Singapore Overnight Rate Average (SORA): Statement of Compliance with the IOSCO Principles for Financial Benchmarks

August 2020

A Summary

1 The Monetary Authority of Singapore (MAS) is Singapore's central bank and integrated financial regulator. MAS also works with the financial industry to develop Singapore as a dynamic international financial centre.

2 The Singapore Overnight Rate Average (SORA) is the volume-weighted average rate of borrowing transactions in the unsecured overnight interbank SGD cash market in Singapore between 8.00am and 6.15pm. MAS has been the administrator of SORA since 2005. On 5 August 2020, the SORA calculation methodology was enhanced to broaden its representativeness.¹

3 As a central bank, MAS does not fall within scope of the Principles for Financial Benchmarks developed by the International Organisation of Securities Commissions (IOSCO Principles). Nevertheless, given the growing importance of SORA as a key interest rate benchmark in SGD financial markets², MAS has undertaken an assessment of its compliance against the IOSCO Principles for the administration of SORA, and has issued a Statement of Compliance with the IOSCO Principles. Demonstrating that the processes around the administration of SORA are consistent with international best practice for benchmark administration serves to enhance market confidence in the use of SORA.

4 MAS has assessed that it is compliant with the IOSCO Principles that are applicable to its role as the administrator of SORA. This is summarised in the table below. The Statement of Compliance is set out in Section B, while the detailed self-assessment against each IOSCO Principle is set out in Section C of this document.

Table: Overview of Compliance with IOSCO Principles 

Governance	Quality of Methodology
<ul style="list-style-type: none">✓ Principle 1: Overall Responsibility of the Administrator❖ Principle 2: Oversight of Third Parties✓ Principle 3: Conflicts of Interest for Administrators✓ Principle 4: Control Framework for Administrators✓ Principle 5: Internal Oversight	<ul style="list-style-type: none">✓ Principle 11: Content of Methodology✓ Principle 12: Changes to the Methodology✓ Principle 13: Transition❖ Principle 14: Submitter Code of Conduct✓ Principle 15: Internal Controls over Data Collection
Quality of Benchmark	Accountability
<ul style="list-style-type: none">✓ Principle 6: Benchmark Design✓ Principle 7: Data Sufficiency✓ Principle 8: Hierarchy of Data Inputs✓ Principle 9: Transparency of Benchmark Determinations✓ Principle 10: Periodic Review	<ul style="list-style-type: none">✓ Principle 16: Complaints Procedures✓ Principle 17: Audits✓ Principle 18: Audit Trail✓ Principle 19: Cooperation with Regulatory Authorities

Key: ✓ Compliant ❖ Not applicable

¹ The scope of eligible transactions for the calculation of SORA has been broadened. Previously, SORA was based only on brokered unsecured overnight interbank SGD cash transactions provided by brokers. It now captures both brokered and bilateral interbank transactions provided by reporting banks to MAS. The publication timing of SORA for a given business day was also moved to 9am on the next business day in Singapore (from end of a given business day).

² While SORA has been published by MAS since 2005, it was previously only used as an indicator of money market conditions, not as an interest rate benchmark for financial products.

B Statement of Compliance

As the administrator of SORA, MAS affirms that it has:

- (a) put in place appropriate and robust internal frameworks, policies, and procedures commensurate to the risks involved, to ensure the accuracy, integrity, reliability and transparency in the administration of SORA as a financial benchmark, and that such policies and procedures have been reviewed by the Internal Audit Department of the MAS;
- (b) appropriately designed the control procedures such that the applicable IOSCO Principles are complied with; and
- (c) obtained the endorsement of the internal Oversight Committee (set up in accordance with Principle 5 of the IOSCO Principles), on the policies and procedures in relation to the administration of SORA.

The Monetary Authority of Singapore

5 August 2020

C Self-Assessment Against the IOSCO Principles

Principle	Assessment	Comments
Governance		
<p>1. Overall Responsibility of the Administrator</p> <p>The Administrator should retain primary responsibility for all aspects of the Benchmark determination process.</p> <p>For example, this includes:</p> <ul style="list-style-type: none"> a) Development: The definition of the Benchmark and Benchmark Methodology; b) Determination and Dissemination: Accurate and timely compilation and publication and distribution of the Benchmark; c) Operation: Ensuring appropriate transparency over significant decisions affecting the compilation of the Benchmark and any related determination process, including contingency measures in the event of absence of or insufficient inputs, market stress or disruption, failure of critical infrastructure, or other relevant factors; and d) Governance: Establishing credible and transparent governance, oversight and accountability procedures for the Benchmark determination process, including an identifiable oversight function accountable for the development, issuance and operation of the Benchmark. 	Compliant	<p>MAS has been the administrator of SORA since 2005. On 5 August 2020, the SORA calculation methodology was enhanced to broaden its representativeness, following an industry consultation process with relevant stakeholders. The scope of eligible transactions for the calculation of SORA has been broadened. Previously, SORA was based only on brokered unsecured overnight interbank SGD cash transactions provided by brokers. It now captures both brokered and bilateral interbank transactions provided by reporting banks to MAS. The publication timing of SORA for a given business day was also moved to 9am on the next business day in Singapore (from end of a given business day).</p> <p>MAS as the administrator of SORA, is responsible for its development, determination, operation, governance, and publication.</p> <p>The Key Features and Calculation Methodology document on the MAS website outlines the following aspects of SORA:</p> <ul style="list-style-type: none"> a) Definition and methodology of SORA; b) Processes for ensuring the accurate and timely compilation and publication of SORA; c) Contingency arrangements in the event of insufficient eligible transactions; and d) Policies for dealing with data errors and republication. <p>All reporting banks have been provided with instructions and guidance on how to report data, including contingency procedures for reporting data across various scenarios e.g. in the event of technical difficulties.</p> <p>An Oversight Committee within MAS oversees the administration of SORA, including the SORA methodology and control framework. More</p>

Principle	Assessment	Comments
		details on the key responsibilities of the Oversight Committee are provided under Principle 5.
<p>2. Oversight of Third Parties</p> <p>Where activities relating to the Benchmark determination process are undertaken by third parties - for example collection of inputs, publication or where a third party acts as Calculation Agent - the Administrator should maintain appropriate oversight of such third parties. The Administrator (and its oversight function) should consider adopting policies and procedures that:</p> <ul style="list-style-type: none"> a) Clearly define and substantiate through appropriate written arrangements the roles and obligations of third parties who participate in the Benchmark determination process, as well as the standards the Administrator expects these third parties to comply with; b) Monitor third parties' compliance with the standards set out by the Administrator; c) Make available to Stakeholders and any relevant Regulatory Authority the identity and roles of third parties who participate in the Benchmark determination process; and d) Take reasonable steps, including contingency plans, to avoid undue operational risk related to the participation of third parties in the Benchmark determination process. <p>This Principle does not apply in relation to a third party from whom an Administrator sources data if that third party is a Regulated Market or Exchange.</p>	Not applicable	This principle is not applicable as all aspects of the administration of SORA are undertaken by MAS.
<p>3. Conflicts of Interest for Administrators</p> <p>To protect the integrity and independence of Benchmark determinations, Administrators should document, implement and enforce policies and procedures for the identification,</p>	Compliant	As the administrator of SORA, MAS has considered the possible perceived conflicts of interest that could arise from the administration of SORA, for MAS as well as staff involved.

Principle	Assessment	Comments
<p>disclosure, management, mitigation or avoidance of conflicts of interest.</p> <p>Administrators should review and update their policies and procedures as appropriate.</p> <p>Administrators should disclose any material conflicts of interest to their users and any relevant Regulatory Authority, if any.</p> <p>The framework should be appropriately tailored to the level of existing or potential conflicts of interest identified and the risks that the Benchmark poses and should seek to ensure:</p> <ul style="list-style-type: none"> a) Existing or potential conflicts of interest do not inappropriately influence Benchmark determinations; b) Personal interests and connections or business connections do not compromise the Administrator's performance of its functions; c) Segregation of reporting lines within the Administrator, where appropriate, to clearly define responsibilities and prevent unnecessary or undisclosed conflicts of interest or the perception of such conflicts; d) Adequate supervision and sign-off by authorised or qualified employees prior to releasing Benchmark determinations; e) The confidentiality of data, information and other inputs submitted to, received by or produced by the Administrator, subject to the disclosure obligations of the Administrator; f) Effective procedures to control the exchange of information between staff engaged in activities involving a risk of conflicts of interest or between staff and third parties, where that 		<p>Appropriate measures have been put in place to segregate roles and institute independent checks and reviews. The control framework underpinning MAS' role as administrator is subject to the review and challenge by the Oversight Committee, and includes procedures to identify, manage, mitigate or avoid such possible conflicts of interest.</p> <p>The key features of MAS' framework to address conflicts of interest are set out below:</p> <ul style="list-style-type: none"> a) The conduct of money market operations (MMO) by MAS, including the issuance of MMO instruments such as MAS floating rate notes (MAS FRN), is undertaken separately from the computation of SORA. In particular, SORA is computed from interbank transactions, and does not include transactions involving MAS. The calculation methodology is rule-based and follows the procedures set out in the Key Features and Calculation Methodology document. b) MAS' Code of Conduct sets out that staff should avoid situations that may give rise to actual, potential, or perceived conflicts of personal interest, and to take appropriate steps to mitigate personal potential conflicts of interest, should these arise. c) Robust control processes to reduce manual intervention, segregate reporting lines and clearly define responsibilities have been established. For example, final pre-publication checks are undertaken by a business function that is independent from the MMO function. d) Maker-checker function for all key processes, with relevant audit trail to support record-keeping and internal reviews have been established. Appropriate training is provided to staff involved in the administration of SORA.

Principle	Assessment	Comments
<p>information may reasonably affect any Benchmark determinations; and</p> <p>g) Adequate remuneration policies that ensure all staff who participate in the Benchmark determination are not directly or indirectly rewarded or incentivised by the levels of the Benchmark.</p> <p>An Administrator's conflict of interest framework should seek to mitigate existing or potential conflicts created by its ownership structure or control, or due to other interests the Administrator's staff or wider group may have in relation to Benchmark determinations. To this end, the framework should:</p> <p>a) Include measures to avoid, mitigate or disclose conflicts of interest that may exist between its Benchmark determination business (including all staff who perform or otherwise participate in Benchmark production responsibilities), and any other business of the Administrator or any of its affiliates; and</p> <p>b) Provide that an Administrator discloses conflicts of interest arising from the ownership structure or the control of the Administrator to its Stakeholders and any relevant Regulatory Authority in a timely manner.</p>		<p>e) Internal policies are in place to ensure that staff safeguard, at all times, the confidentiality of all data and information obtained during their course of employment, and ensure that only authorised personnel have access to it.</p> <p>f) Adherence to Government-wide IT policies for all processes involving the transmission, computation and storage of data inputs submitted by reporting banks to safeguard the confidentiality of data.</p> <p>g) Staff remuneration is not based on specific levels of SORA.</p>
<p>4. Control Framework for Administrators</p> <p>The Administrator should implement a control framework for the process of determining and distributing the Benchmark. The control framework should be appropriately tailored to the materiality of the potential or existing conflicts of interest identified, the extent of the use of discretion in the Benchmark setting process and to the nature of Benchmark inputs and outputs. The control framework should be documented and available to relevant Regulatory Authorities, if any. A summary of its</p>	Compliant	<p>MAS has established a control framework to set out the roles and responsibilities of the administrator in the production of SORA.</p> <p>The framework includes:</p> <p>a) <u>Conflicts of interest</u>: In line with Principle 3, MAS has reviewed its internal arrangements related to the administration of SORA, and has put in place an appropriate control framework to identify, manage and mitigate any</p>

Principle	Assessment	Comments
<p>main features should be Published or Made Available to Stakeholders.</p> <p>This control framework should be reviewed periodically and updated as appropriate. The framework should address the following areas:</p> <ul style="list-style-type: none"> a) Conflicts of interest in line with Principle 3 on conflicts of interests; b) Integrity and quality of Benchmark determination: <ul style="list-style-type: none"> i. Arrangements to ensure that the quality and integrity of Benchmarks is maintained, in line with principles 6 to 15 on the quality of the Benchmark and Methodology; ii. Arrangements to promote the integrity of Benchmark inputs, including adequate due diligence on input sources; iii. Arrangements to ensure accountability and complaints mechanisms are effective, in line with principles 16 to 19; and iv. Providing robust infrastructure, policies and procedures for the management of risk, including operational risk. c) Whistleblowing mechanism: <ul style="list-style-type: none"> i. Administrators should establish an effective whistleblowing mechanism to facilitate early awareness of any potential misconduct or irregularities that may arise. This mechanism should allow for external reporting of such cases where appropriate. d) Expertise: <ul style="list-style-type: none"> i. Ensuring Benchmark determinations are made by personnel who possess the relevant levels of expertise, with a process for periodic review of their competence; and 		<p>potential or perceived conflicts of interest.</p> <ul style="list-style-type: none"> b) <u>Integrity and quality of benchmark determination</u>: In line with Principles 6 to 15, MAS has robust processes for the determination of SORA, including controls over the data inputs. Consistent with Principle 15, data is collected from reporting banks through secured channels that are appropriate for the security classification of the data. Prior to being used to calculate SORA, the data is validated and stored by MAS. Policies are in place to define the responsibilities of staff involved, including the review of the data inputs and calculation and publication of SORA. Short-term contingency arrangements are in place in case there are insufficient eligible transactions. c) <u>Whistleblowing mechanism</u>: MAS maintains a whistleblowing mechanism to address reporting of potential misconduct. Any alleged market misconduct will be escalated to MAS' supervisory/enforcement functions, which are independent from the administration of SORA, for investigation. Any complaint on the administration of SORA can be made directly to MAS through the feedback form at www.mas.gov.sg/feedback or by calling 6225 5577. General queries regarding the administration of SORA can be made directly to the Monetary and Domestic Markets Management Department (MDD) by emailing sgddiv@mas.gov.sg or calling 6229 9150. d) <u>Expertise</u>: All roles involved in the calculation of SORA are performed by staff with relevant knowledge and expertise, and who have received internal training for the benchmark administration process.

Principle	Assessment	Comments
<p>ii. Staff training, including ethics and conflicts of interest training, and continuity and succession planning for personnel.</p> <p><i>Where a Benchmark is based on Submissions:</i></p> <p>Administrators should promote the integrity of inputs by:</p> <ul style="list-style-type: none"> a) Ensuring as far as possible that the Submitters comprise an appropriately representative group of participants taking into consideration the underlying Interest measured by the Benchmark; b) Employing a system of appropriate measures so that, to the extent possible, Submitters comply with the Submission guidelines, as defined in the Submitter Code of Conduct and the Administrators' applicable quality and integrity standards for Submission; c) Specifying how frequently Submissions should be made and specifying that inputs or Submissions should be made for every Benchmark determination; and d) Establishing and employing measures to effectively monitor and scrutinise inputs or Submissions. This should include pre-compilation or pre-publication monitoring to identify and avoid errors in inputs or Submissions, as well as ex-post analysis of trends and outliers. 		
<p>5. Internal Oversight</p> <p>Administrators should establish an oversight function to review and provide challenge on all aspects of the Benchmark determination process. This should include consideration of the features and intended, expected or known usage of the Benchmark and the materiality of</p>	Compliant	MAS has established an internal Oversight Committee to review and provide challenge on all aspects of the SORA determination process. The Oversight Committee comprises members of MAS' senior management, including

Principle	Assessment	Comments
<p>existing or potential conflicts of interest identified.</p> <p>The oversight function should be carried out either by a separate committee, or other appropriate governance arrangements. The oversight function and its composition should be appropriate to provide effective scrutiny of the Administrator. Such oversight function could consider groups of Benchmarks by type or asset class, provided that it otherwise complies with this Principle.</p> <p>An Administrator should develop and maintain robust procedures regarding its oversight function, which should be documented and available to relevant Regulatory Authorities, if any. The main features of the procedures should be Made Available to Stakeholders. These procedures should include:</p> <p>The terms of reference of the oversight function:</p> <ul style="list-style-type: none"> a) Criteria to select members of the oversight function; b) The summary details of membership of any committee or arrangement charged with the oversight function, along with any declarations of conflicts of interest and processes for election, nomination or removal and replacement of committee members. <p>The responsibilities of the oversight function include:</p> <ul style="list-style-type: none"> a) Oversight of the Benchmark design: <ul style="list-style-type: none"> i. Periodic review of the definition of the Benchmark and its Methodology; ii. Taking measures to remain informed about issues and risks to the Benchmark, as well as commissioning external reviews of the Benchmark (as appropriate); 		<p>representatives from functions that are independent of the SORA administration process.</p> <p>The Oversight Committee's key responsibilities include:</p> <ul style="list-style-type: none"> a) Periodic review of the definition and methodology of SORA; b) Oversight of any changes to the methodology; c) Review of key SORA publication statistics and occurrences of error; d) Following up on internal audit findings related to the SORA administration process; e) Investigation of complaints (except for alleged market misconduct complaints mentioned in Principle 4) or inquiries regarding the administration of SORA; f) Review of the policies and approach in consulting relevant stakeholders on benchmark cessation should this become relevant; and g) Oversight of measures to identify and mitigate risks in the benchmark administration process.

Principle	Assessment	Comments
<p>iii. Overseeing any changes to the Benchmark Methodology, including assessing whether the Methodology continues to appropriately measure the underlying Interest, reviewing proposed and implemented changes to the Methodology, and authorising or requesting the Administrator to undertake a consultation with Stakeholders where known or its Subscribers on such changes as per Principle 12; and</p> <p>iv. Reviewing and approving procedures for termination of the Benchmark, including guidelines that set out how the Administrator should consult with Stakeholders about such cessation.</p> <p>b) Oversight of the integrity of Benchmark determination and control framework:</p> <p>i. Overseeing the management and operation of the Benchmark, including activities related to Benchmark determination undertaken by a third party;</p> <p>ii. Considering the results of internal and external audits, and following up on the implementation of remedial actions highlighted in the results of these audits; and</p> <p>iii. Overseeing any exercise of Expert Judgment by the Administrator and ensuring Published Methodologies have been followed.</p> <p>Where conflicts of interests may arise in the Administrator due to its ownership structures or controlling interests, or due to other activities conducted by any entity owning or controlling the Administrator or by the Administrator or any of its affiliates: the Administrator should establish an independent oversight function which includes a balanced representation of a range of Stakeholders where known, Subscribers and Submitters,</p>		

Principle	Assessment	Comments
<p>which is chosen to counterbalance the relevant conflict of interest.</p> <p><i>Where a Benchmark is based on Submissions:</i></p> <p>The oversight function should provide suitable oversight and challenge of the Submissions by:</p> <ul style="list-style-type: none"> a) Overseeing and challenging the scrutiny and monitoring of inputs or Submissions by the Administrator. This could include regular discussions of inputs or Submission patterns, defining parameters against which inputs or Submissions can be analysed, or querying the role of the Administrator in challenging or sampling unusual inputs or Submissions; b) Overseeing the Code of Conduct for Submitters; c) Establishing effective arrangements to address breaches of the Code of Conduct for Submitters; and d) Establishing measures to detect potential anomalous or suspicious Submissions and in case of suspicious activities, to report them, as well as any misconduct by Submitters of which it becomes aware to the relevant Regulatory Authorities, if any. 		
Quality of Benchmark		
<p>6. Benchmark Design</p> <p>The design of the Benchmark should seek to achieve, and result in an accurate and reliable representation of the economic realities of the Interest it seeks to measure, and eliminate factors that might result in a distortion of the price, rate, index or value of the Benchmark.</p> <p>Benchmark design should take into account the following generic non-exclusive features, and</p>	Compliant	<p>SORA is defined as “the volume-weighted average rate of borrowing transactions in the unsecured overnight interbank SGD cash market in Singapore between 8.00am and 6.15pm.” Within the unsecured interbank SGD market, the overnight segment is the most active, as banks transact with other banks daily to manage their cash positions for payment and settlement.</p>

Principle	Assessment	Comments
<p>other factors should be considered, as appropriate to the particular Interest:</p> <ul style="list-style-type: none"> a) Adequacy of the sample used to represent the Interest; b) Size and liquidity of the relevant market (for example whether there is sufficient trading to provide observable, transparent pricing); c) Relative size of the underlying market in relation to the volume of trading in the market that references the Benchmark; d) The distribution of trading among Market Participants (market concentration); e) Market dynamics (e.g., to ensure that the Benchmark reflects changes to the assets underpinning a Benchmark). 		<p>MAS has conducted a thorough review of the profile and structure of the underlying overnight interbank SGD cash market to ensure that the current SORA methodology captures data from a competitive and active market. MAS has identified the key banks that collectively make up a representative share of the overnight interbank unsecured SGD cash market, and legally required these banks to report transaction-level data directly to MAS for the computation of SORA.</p> <p>The list of reporting banks is set out in the Key Features and Calculation Methodology document, and represents the most active participants in the underlying market for SORA. MAS reviews the list of reporting banks periodically to ensure that the reporting requirement remains commensurate to banks' activity in the unsecured overnight interbank SGD cash market, and that the coverage of banks provides an accurate and reliable representation of the underlying market for SORA.</p> <p>Data sufficiency conditions are in place to ensure that a minimum level of market activity is met before the transaction data is used in the computation of SORA (see details in Principle 7).</p> <p>SORA is recognised by the industry as a robust and credible benchmark. The Association of Banks of Singapore (ABS) and Singapore Foreign Exchange and Markets Committee (SFEMC) had recommended SORA as the most suitable benchmark to replace SOR.</p>
<p>7. Data Sufficiency</p> <p>The data used to construct a Benchmark determination should be sufficient to accurately and reliably represent the Interest measured by the Benchmark and should:</p> <ul style="list-style-type: none"> a) Be based on prices, rates, indices or values that have been formed by the competitive forces of supply and demand in order to provide confidence that the price discovery system is reliable; and 	Compliant	<p>SORA is computed based on reporting banks' arms-length transactions.</p> <p>Following a thorough review of historical data, MAS has put in place the following data sufficiency conditions which have to be met, for SORA to be computed from reported transactions:</p> <ul style="list-style-type: none"> • Minimum number of reporting banks with eligible transactions: 5 • Minimum number of eligible transactions: 10

Principle	Assessment	Comments
<p>b) Be anchored by observable transactions entered into at arm's length between buyers and sellers in the market for the Interest the Benchmark measures in order for it to function as a credible indicator of prices, rates, indices or values.</p> <p>This Principle requires that a Benchmark be based upon (i.e., anchored in) an active market having observable Bona Fide, Arms-Length Transactions. This does not mean that every individual Benchmark determination must be constructed solely of transaction data. Provided that an active market exists, conditions in the market on any given day might require the Administrator to rely on different forms of data tied to observable market data as an adjunct or supplement to transactions. Depending upon the Administrator's Methodology, this could result in an individual Benchmark determination being based predominantly, or exclusively, on bids and offers or extrapolations from prior transactions. This is further clarified in Principle 8.</p> <p>Provided that subparagraphs (a) and (b) above are met, Principle 7 does not preclude Benchmark Administrators from using executable bids or offers as a means to construct Benchmarks where anchored in an observable market consisting of Bona Fide, Arms-Length transactions.²³</p> <p>This Principle also recognizes that various indices may be designed to measure or reflect the performance of a rule-based investment strategy, the volatility or behaviour of an index or market or other aspects of an active market. Principle 7 does not preclude the use of non-transactional data for such indices that are not designed to represent transactions and where the nature of the index is such that non-transactional data is used to reflect what the index is designed to measure. For example, certain volatility indices, which are designed to measure the expected volatility of an index of securities transactions, rely on non-transactional data, but the data is derived from</p>		<ul style="list-style-type: none"> • Minimum volume of eligible transactions: S\$500 million <p>If there are insufficient transactions on a given day, SORA will be produced using the short-term contingency arrangements outlined in Principle 8. The above data sufficiency conditions are also set out in the Key Features and Calculation Methodology document.</p>

Principle	Assessment	Comments
and thus “anchored” in an actual functioning securities or options market.		
<p>8. Hierarchy of Data Inputs</p> <p>An Administrator should establish and Publish or Make Available clear guidelines regarding the hierarchy of data inputs and exercise of Expert Judgment used for the determination of Benchmarks. In general, the hierarchy of data inputs should include:</p> <ul style="list-style-type: none"> a) Where a Benchmark is dependent upon Submissions, the Submitters’ own concluded arms-length transactions in the underlying interest or related markets; b) Reported or observed concluded Arm’s-length Transactions in the underlying interest; c) Reported or observed concluded Arm’s-length Transactions in related markets; d) Firm (executable) bids and offers; and e) Other market information or Expert Judgments. <p>Provided that the Data Sufficiency Principle is met (i.e., an active market exists), this Principle is not intended to restrict an Administrator’s flexibility to use inputs consistent with the Administrator’s approach to ensuring the quality, integrity, continuity and reliability of its Benchmark determinations, as set out in the Administrator’s Methodology. The Administrator should retain flexibility to use the inputs it believes are appropriate under its Methodology to ensure the quality and integrity of its Benchmark. For example, certain Administrators may decide to rely upon Expert Judgment in an active albeit low liquidity market, when transactions may not be consistently available each day. IOSCO also</p>	Compliant	<p>SORA is computed based on reporting banks’ arms-length transactions. If transactions are insufficient or not available on a given day, SORA will be produced using contingent data sources, as outlined below.</p> <p><u>Short-term contingency arrangements in event of data insufficiency</u></p> <p>If the data sufficiency conditions in Principle 7 are not met, SORA will not be computed using the normal calculation methodology, and a contingency process will be triggered (Contingency SORA).</p> <p>Contingency SORA will be computed by first calculating the difference between the reference rate of MAS Standing Facility (SF reference rate)³ on trade date and that of the previous business day. This spread will then be added to the previous day’s SORA to get the Contingency SORA rate, subject to a floor of zero. The formula is as follows:</p> <p>Contingency SORA for day T =</p> <p style="padding-left: 40px;">SORA on day T-1 + (SF reference rate on day T - SF reference rate on day T-1), subject to a floor of zero</p> <p>In the event that the contingency process is used, this will be indicated on the MAS website. The above short-term contingency arrangements are also outlined in the Key Features and Calculation Methodology document.</p>

³ The MAS Standing Facility (SF) is a discount window that allows eligible counterparties to borrow SGD on an overnight and collateralised basis, or deposit SGD on an overnight basis. The SF reference rate is the volume-weighted average of successful bids for MAS’ S\$500 million overnight clean borrowing conducted during MMO on the same day, rounded to two decimal places.

Principle	Assessment	Comments
recognizes that there might be circumstances (e.g., a low liquidity market) when a confirmed bid or offer might carry more meaning than an outlier transaction. Under these circumstances, non-transactional data such as bids and offers and extrapolations from prior transactions might predominate in a given Benchmark determination.		
<p>9. Transparency of Benchmark Determinations</p> <p>The Administrator should describe and publish with each Benchmark determination, to the extent reasonable without delaying an Administrator publication deadline:</p> <p>a) A concise explanation, sufficient to facilitate a Stakeholder's or Market Authority's ability to understand how the determination was developed, including, at a minimum, the size and liquidity of the market being assessed (meaning the number and volume of transactions submitted), the range and average volume and range and average of price, and indicative percentages of each type of market data that have been considered in a Benchmark determination; terms referring to the pricing Methodology should be included (i.e., transaction-based, spread-based or interpolated/extrapolated);</p> <p>b) A concise explanation of the extent to which and the basis upon which Expert Judgment if any, was used in establishing a Benchmark determination.</p>	Compliant	<p>SORA for a given business day will be published by 9am on the MAS website on the next business day.</p> <p>Alongside the daily publication of SORA, the following information is also provided:</p> <ul style="list-style-type: none"> • Aggregate volume • Highest and lowest transacted rates • Calculation method: Normal or Contingency, and whether the rate has been republished • SORA Index • 1-month, 3-month and 6-month Compounded SORA <p>SORA is computed solely from interbank transactions provided by reporting banks, and no expert judgement is applied.</p> <p>The following republication policy is also set out in the Key Features and Calculation Methodology document.</p> <p><u>Republication policy</u></p> <p>a) For SORA to be republished, any error must be highlighted by reporting banks to MAS by 11.30am on the day that SORA is published.</p> <p>b) SORA will be republished for a given day if the recalculated benchmark is two or more basis points away from the rate published at 9.00am.</p>

Principle	Assessment	Comments
		<p>c) Republication will be no later than 12.00pm on the same day. MAS will only republish SORA once for a given day.</p> <p>d) Once the republication deadline has passed, no amendment will be made.</p>
<p>10. Periodic Review</p> <p>The Administrator should periodically review the conditions in the underlying Interest that the Benchmark measures to determine whether the Interest has undergone structural changes that might require changes to the design of the Methodology. The Administrator also should periodically review whether the Interest has diminished or is non-functioning such that it can no longer function as the basis for a credible Benchmark.</p> <p>The Administrator should Publish or Make Available a summary of such reviews where material revisions have been made to a Benchmark, including the rationale for the revisions.</p>	Compliant	<p>MAS periodically reviews the SORA methodology to ensure that it remains representative of the underlying market, and continues to be a robust and credible benchmark. In doing so, MAS will review conditions in the underlying market to assess whether the market is undergoing structural change that may warrant a fundamental review of the benchmark methodology.</p> <p>In line with Principle 12, any change to the SORA methodology will be reviewed by the Oversight Committee. Where appropriate, MAS will also consult with relevant stakeholders on any proposed change. Any change to the SORA methodology will be announced to the market through the MAS website and reflected in the Key Features and Calculation Methodology document.</p>
Quality of Methodology		
<p>11. Content of the Methodology</p> <p>The Administrator should document and Publish or Make Available the Methodology used to make Benchmark determinations. The Administrator should provide the rationale for adopting a particular Methodology. The Published Methodology should provide sufficient detail to allow Stakeholders to understand how the Benchmark is derived and to assess its representativeness, its relevance to particular Stakeholders, and its appropriateness as a reference for financial instruments.</p>	Compliant	<p>The Key Features and Calculation Methodology document provides relevant information regarding the determination, publication and governance of SORA, including:</p> <p>a) Definition of SORA and key terms such as scope of reporting banks and eligible transactions;</p> <p>b) Criteria and procedures used to develop the benchmark, including input selection and minimum data sufficiency conditions</p>

Principle	Assessment	Comments
<p>At a minimum, the Methodology should contain:</p> <ul style="list-style-type: none"> a) Definitions of key terms; b) All criteria and procedures used to develop the Benchmark, including input selection, the mix of inputs used to derive the Benchmark, the guidelines that control the exercise of Expert Judgment by the Administrator, priority given to certain data types, minimum data needed to determine a Benchmark, and any models or extrapolation methods; c) Procedures and practices designed to promote consistency in the exercise of Expert Judgment between Benchmark determinations; d) The procedures which govern Benchmark determination in periods of market stress or disruption, or periods where data sources may be absent (e.g., theoretical estimation models); e) The procedures for dealing with error reports, including when a revision of a Benchmark would be applicable; f) Information regarding the frequency for internal reviews and approvals of the Methodology. Where applicable, the Published Methodologies should also include information regarding the procedures and frequency for external review of the Methodology; g) The circumstances and procedures under which the Administrator will consult with Stakeholders, as appropriate; and h) The identification of potential limitations of a Benchmark, including its operation in illiquid or fragmented markets and the possible concentration of inputs. 		<p>needed to determine the benchmark based on reported transactions;</p> <ul style="list-style-type: none"> c) The short-term contingency arrangements which govern benchmark determination in period of market stress or disruption, where the required data sufficiency conditions are not met; and d) Procedures for dealing with error reports, including when a republication of a benchmark would be applicable.

Principle	Assessment	Comments
<p>i) Where a Benchmark is based on Submissions, the additional Principle also applies:</p> <p>j) The Administrator should clearly establish criteria for including and excluding Submitters. The criteria should consider any issues arising from the location of the Submitter, if in a different jurisdiction to the Administrator. These criteria should be available to any relevant Regulatory Authorities, if any, and Published or Made Available to Stakeholders. Any provisions related to changes in composition, including notice periods should be made clear.</p>		
<p>12. Changes to the Methodology</p> <p>An Administrator should Publish or Make Available the rationale of any proposed material change in its Methodology, and procedures for making such changes. These procedures should clearly define what constitutes a material change, and the method and timing for consulting or notifying Subscribers (and other Stakeholders where appropriate, taking into account the breadth and depth of the Benchmark's use) of changes.</p> <p>Those procedures should be consistent with the overriding objective that an Administrator must ensure the continued integrity of its Benchmark determinations. When changes are proposed, the Administrator should specify exactly what these changes entail and when they are intended to apply.</p> <p>The Administrator should specify how changes to the Methodology will be scrutinised, by the oversight function.</p> <p>The Administrator should develop Stakeholder consultation procedures in relation to changes to the Methodology that are deemed material</p>	Compliant	<p>Consistent with Principle 10, MAS periodically reviews the SORA methodology to ensure that it remains representative of the underlying market, and continues to be a robust and credible benchmark.</p> <p>Any changes to the methodology must be reviewed and endorsed by the Oversight Committee. Where appropriate, a public consultation will also be undertaken to seek comments from relevant stakeholders. Any material changes will be announced to the market through the MAS website and reflected in the Key Features and Calculation Methodology document.</p>

Principle	Assessment	Comments
<p>by the oversight function, and that are appropriate and proportionate to the breadth and depth of the Benchmark's use and the nature of the Stakeholders. Procedures should:</p> <ul style="list-style-type: none"> a) Provide advance notice and a clear timeframe that gives Stakeholders sufficient opportunity to analyse and comment on the impact of such proposed material changes, having regard to the Administrator's assessment of the overall circumstances; and b) Provide for Stakeholders' summary comments, and the Administrator's summary response to those comments, to be made accessible to all Stakeholders after any given consultation period, except where the commenter has requested confidentiality. 		
<p>13. Transition</p> <p>Administrators should have clear written policies and procedures, to address the need for possible cessation of a Benchmark, due to market structure change, product definition change, or any other condition which makes the Benchmark no longer representative of its intended Interest. These policies and procedures should be proportionate to the estimated breadth and depth of contracts and financial instruments that reference a Benchmark and the economic and financial stability impact that might result from the cessation of the Benchmark. The Administrator should take into account the views of Stakeholders and any relevant Regulatory and National Authorities in determining what policies and procedures are appropriate for a particular Benchmark.</p>	Compliant	<p>Should SORA no longer represent its underlying interest, MAS may consider ceasing production of the benchmark, or evolving its methodology to ensure that it remains representative and robust. Prior to taking this decision, benchmark governance procedures will be followed, including: (a) a review by the Oversight Committee and (b) a public consultation to enable affected stakeholders to provide feedback on the proposed cessation.</p> <p>MAS has, through the Steering Committee for SOR Transition to SORA (SC-STTS)⁴, worked with industry representatives to ensure that contracts or other financial instruments have robust fall-back provisions in place in the event of material changes to, or cessation of, the referenced benchmarks, including SORA.</p>

⁴ The SC-STTS was established by MAS in [August 2019](#), to oversee the industry-wide interest rate benchmark transition from the SGD Swap Offer Rate (SOR) to SORA. The membership of SC-STTS comprises senior representatives from key banks in Singapore, relevant industry associations, and MAS.

Principle	Assessment	Comments
<p>These written policies and procedures should be Published or Made Available to all Stakeholders.</p> <p>Administrators should encourage Subscribers and other Stakeholders who have financial instruments that reference a Benchmark to take steps to make sure that:</p> <ul style="list-style-type: none"> a) Contracts or other financial instruments that reference a Benchmark, have robust fall-back provisions in the event of material changes to, or cessation of, the referenced Benchmark; and b) Stakeholders are aware of the possibility that various factors, including external factors beyond the control of the Administrator, might necessitate material changes to a Benchmark. <p>Administrators' written policies and procedures to address the possibility of Benchmark cessation could include the following factors, if determined to be reasonable and appropriate by the Administrator:</p> <ul style="list-style-type: none"> a) Criteria to guide the selection of a credible, alternative Benchmark such as, but not limited to, criteria that seek to match to the extent practicable the existing Benchmark's characteristics (e.g., credit quality, maturities and liquidity of the alternative market), differentials between Benchmarks, the extent to which an alternative Benchmark meets the asset/liability needs of Stakeholders, whether the revised Benchmark is investable, the availability of transparent transaction data, the impact on Stakeholders and impact of existing legislation; b) The practicality of maintaining parallel Benchmarks (e.g., where feasible, maintain the existing Benchmark for a defined period of time to permit 		

Principle	Assessment	Comments
<p>existing contracts and financial instruments to mature and publish a new Benchmark) in order to accommodate an orderly transition to a new Benchmark;</p> <p>c) The procedures that the Administrator would follow in the event that a suitable alternative cannot be identified;</p> <p>d) In the case of a Benchmark or a tenor of a Benchmark that will be discontinued completely, the policy defining the period of time in which the Benchmark will continue to be produced in order to permit existing contracts to migrate to an alternative Benchmark if necessary; and</p> <p>e) The process by which the Administrator will engage Stakeholders and relevant Market and National Authorities, as appropriate, in the process for selecting and moving towards an alternative Benchmark, including the timeframe for any such action commensurate with the tenors of the financial instruments referencing the Benchmarks and the adequacy of notice that will be provided to Stakeholders.</p>		
<p>14. Submitter Code of Conduct</p> <p>Where a Benchmark is based on Submissions, the following additional Principle also applies:</p> <p>The Administrator should develop guidelines for Submitters ("Submitter Code of Conduct"), which should be available to any relevant Regulatory Authorities, if any and Published or Made Available to Stakeholders.</p> <p>The Administrator should only use inputs or Submissions from entities which adhere to the Submitter Code of Conduct and the Administrator should appropriately monitor</p>	Not applicable	This principle is not applicable, as SORA is computed solely from interbank transactions provided by reporting banks, and is not computed based on Submissions.

Principle	Assessment	Comments
and record adherence from Submitters. The Administrator should require Submitters to confirm adherence to the Submitter Code of Conduct annually and whenever a change to the Submitter Code of Conduct has occurred.		
15. Internal Controls over Data Collection When an Administrator collects data from any external source the Administrator should ensure that there are appropriate internal controls over its data collection and transmission processes. These controls should address the process for selecting the source, collecting the data and protecting the integrity and confidentiality of the data. Where Administrators receive data from employees of the Front Office Function, the Administrator should seek corroborating data from other sources.	Compliant	<p>The data reported to MAS for SORA computation is provided through a secure data reporting channel. MAS also conducts appropriate data validation checks to ensure that the data is provided in the appropriate manner and form, and is consistent with the definition of eligible transactions as set out in the Key Features and Calculation Methodology document.</p> <p>Internal controls have been put in place to protect the integrity and confidentiality of the data. Staff involved in the benchmark administration process are trained in the proper handling of the data to protect data integrity and confidentiality.</p>
Accountability		
16. Complaints Procedures The Administrator should establish and Publish or Make Available a written complaints procedures policy, by which Stakeholders may submit complaints including concerning whether a specific Benchmark determination is representative of the underlying Interest it seeks to measure, applications of the Methodology in relation to a specific Benchmark determination(s) and other Administrator decisions in relation to a Benchmark determination. The complaints procedures policy should: <ul style="list-style-type: none"> a) Permit complaints to be submitted through a user-friendly complaints 	Compliant	<p>Complaints relating to the administration of SORA can be made directly to MAS through the feedback form at www.mas.gov.sg/feedback or by calling 6225 5577. This mailbox is monitored by MAS' central corporate communications department, outside of the SORA administration reporting line.</p> <p>The escalation process would depend on the nature of complaint received. For example, where a complaint relates to alleged market conduct issues, it would be referred to the relevant supervisory/enforcement departments in MAS for investigation, with the Oversight Committee kept apprised of the findings and the regulatory or enforcement action taken in the event of market misconduct. Where a complaint</p>

Principle	Assessment	Comments
<p>process such as an electronic Submission process;</p> <p>b) Contain procedures for receiving and investigating a complaint made about the Administrator's Benchmark determination process on a timely and fair basis by personnel who are independent of any personnel who may be or may have been involved in the subject of the complaint, advising the complainant and other relevant parties of the outcome of its investigation within a reasonable period and retaining all records concerning complaints;</p> <p>c) Contain a process for escalating complaints, as appropriate, to the Administrator's governance body; and</p> <p>d) Require all documents relating to a complaint, including those submitted by the complainant as well as the Administrator's own record, to be retained for a minimum of five years, subject to applicable national legal or regulatory requirements.</p> <p>Disputes about a Benchmarking determination, which are not formal complaints, should be resolved by the Administrator by reference to its standard appropriate procedures. If a complaint results in a change in a Benchmark determination, that should be Published or Made Available to Subscribers and Published or Made Available to Stakeholders as soon as possible as set out in the Methodology.</p>		<p>relates to the SORA methodology, it would be considered as part of the periodic review undertaken by MAS as administrator (in accordance with governance processes outlined in Principles 10 and 12). Where a complaint relates to an MAS staff's actions in relation to the administration of SORA, it would be escalated internally for investigation and to the Oversight Committee for review.</p> <p>All documents relating to a complaint will be retained for a minimum of seven years.</p>
<p>17. Audits</p> <p>The Administrator should appoint an independent internal or external auditor with appropriate experience and capability to periodically review and report on the Administrator's adherence to its stated criteria and with the Principles. The frequency of audits</p>	Compliant	<p>MAS' Internal Audit Department is responsible for undertaking periodic audits of the SORA administration process in accordance with the risk assessment framework approved by the Board's Audit Committee. The audit results are reviewed by the Oversight Committee, MAS'</p>

Principle	Assessment	Comments
<p>should be proportionate to the size and complexity of the Administrator's operations.</p> <p>Where appropriate to the level of existing or potential conflicts of interest identified by the Administrator (except for Benchmarks that are otherwise regulated or supervised by a National Authority other than a relevant Regulatory Authority), an Administrator should appoint an independent external auditor with appropriate experience and capability to periodically review and report on the Administrator's adherence to its stated Methodology. The frequency of audits should be proportionate to the size and complexity of the Administrator's Benchmark operations and the breadth and depth of Benchmark use by Stakeholders.</p>		senior management, and the Board's Audit Committee.
<p>18. Audit Trail</p> <p>Written records should be retained by the Administrator for five years, subject to applicable national legal or regulatory requirements on:</p> <ul style="list-style-type: none"> a) All market data, Submissions and any other data and information sources relied upon for Benchmark determination; b) The exercise of Expert Judgment made by the Administrator in reaching a Benchmark determination; c) Other changes in or deviations from standard procedures and Methodologies, including those made during periods of market stress or disruption; d) The identity of each person involved in producing a Benchmark determination; and e) Any queries and responses relating to data inputs. 	Compliant	<p>All written records related to SORA will be retained by MAS for at least seven years, including:</p> <ul style="list-style-type: none"> a) All market data and any other information sources relied upon for benchmark determination; b) Changes in or deviations from standard procedures and methodologies, including those made during period of market stress or disruption; c) The identity of each person involved in producing a benchmark determination; and d) Any queries and responses relating to data inputs <p>MAS as the benchmark administrator does not exercise any expert judgement in reaching a benchmark determination. SORA is computed solely from interbank transactions provided by reporting banks and is not based on Submissions.</p>

Principle	Assessment	Comments
<p>If these records are held by a Regulated Market or Exchange the Administrator may rely on these records for compliance with this Principle, subject to appropriate written record sharing agreements.</p> <p>When a Benchmark is based on Submissions, the following additional Principle also applies:</p> <p>Submitters should retain records for five years subject to applicable national legal or regulatory requirements on:</p> <ul style="list-style-type: none"> a) The procedures and Methodologies governing the Submission of inputs; b) The identity of any other person who submitted or otherwise generated any of the data or information provided to the Administrator; c) Names and roles of individuals responsible for Submission and Submission oversight; d) Relevant communications between submitting parties; e) Any interaction with the Administrator; f) Any queries received regarding data or information provided to the Administrator; g) Declaration of any conflicts of interests and aggregate exposures to Benchmark related instruments; h) Exposures of individual traders/desks to Benchmark related instruments in order to facilitate audits and investigations; and i) Findings of external/internal audits, when available, related to Benchmark Submission remedial actions and progress in implementing them. 		

Principle	Assessment	Comments
<p>19. Cooperation with Regulatory Authorities</p> <p>Relevant documents, Audit Trails and other documents subject to these Principles shall be made readily available by the relevant parties to the relevant Regulatory Authorities in carrying out their regulatory or supervisory duties and handed over promptly upon request.</p>	Compliant	<p>MAS has prescribed SORA as a financial benchmark under the Securities and Futures Act (SFA). This will ensure that regulatory and enforcement actions can be taken against any person found to have committed market misconduct⁵ related to SORA. Prescribing SORA as a financial benchmark under the SFA will safeguard the integrity and robustness of SORA, given its growing importance as a key interest rate benchmark in SGD financial markets.</p> <p>Should there be any allegations of market misconduct, relevant data and information related to SORA administration will be provided to the supervisory and enforcement functions within MAS upon request.</p>

⁵ For example, providing a false or misleading appearance to the price, value, performance or rate of SORA, or providing or disseminating any information, or expressing any opinion that is false or misleading to the benchmark administrator.