

Singapore Savings Bonds: Technical Specifications

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1. Basic Features

Issuer

1.1 Singapore Savings Bonds (“Savings Bonds”) are book-entry securities¹ issued by the Singapore Government under the Government Securities Act. They are a form of Singapore Government Securities (“SGS”). The Monetary Authority of Singapore (“MAS”) acts as the Government’s issuing agent.

1.2 Monies raised from the issuance of Savings Bonds shall be placed in the Government Securities Fund (“GSF”). Withdrawals from the GSF may only be for investment and the payment of SGS coupons and principal. The Government may not use issuance proceeds to finance its expenditure.

Tenor, Coupon Frequency & Denomination

1.3 Savings Bonds have a tenor of ten years and pay coupons semi-annually.

1.4 Savings Bonds are denominated in units of S\$500. The minimum application and redemption amount is S\$500.

Issuance & Redemption Frequency

1.5 A new Savings Bond will be issued on the first business day of each month. Applications for an issue will open on the first business day of the month before issuance.

1.6 Holders of Savings Bonds may choose to redeem them at par in any given month, with no penalties (see Section 2). Accrued interest shall be paid, where applicable (see Section 4). Redemption proceeds will be paid out on the first business day of each month. Redemption requests can be made from the first business day of the previous month.

Eligibility & Investment Limits

1.7 Only individuals may apply for and hold Savings Bonds.

1.8 Each individual may hold no more than S\$100,000 across all Savings Bond issues (“Individual limit”).

Non-Transferability

1.9 Savings Bonds may not be transferred or pledged (for example, as collateral). MAS may allow transfers in exceptional circumstances, such as following the death of the bondholder. Applications for transfer of Savings Bonds should be made via the Central Depository (“CDP”), at:

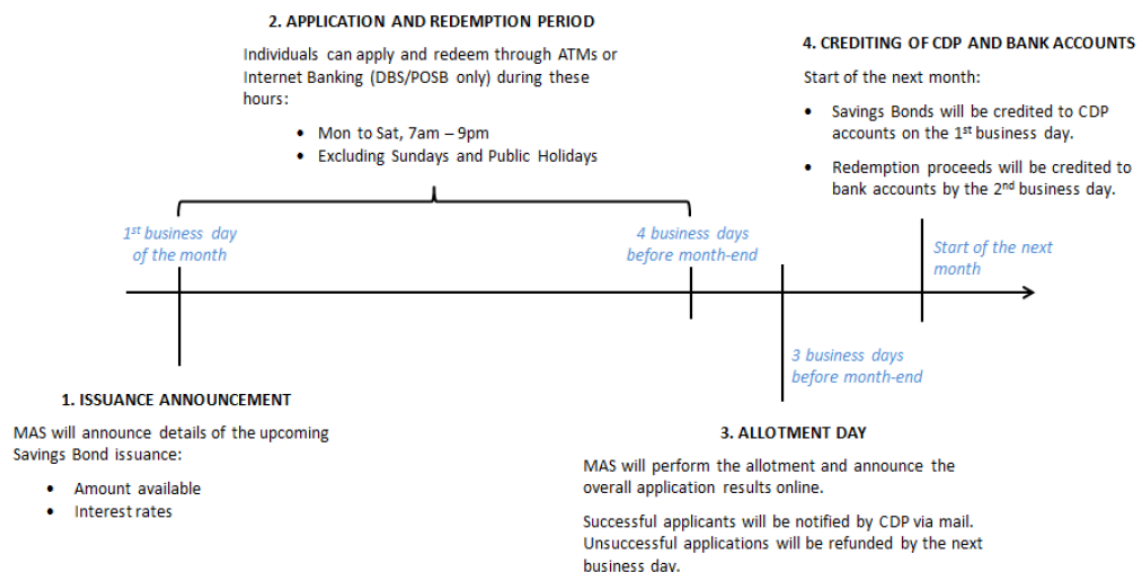
9 North Buona Vista Drive
#01-19/20 The Metropolis
Singapore 138588

¹ I.e. Investors in Savings Bonds will not receive certificates of holding. Instead, custodians of Savings Bonds receive global certificates of holding.

1.10 Savings Bonds transferred or pledged without MAS' prior approval may be redeemed by MAS from the transferee or pledgee, as the case may be.

2. Application/Redemption Procedures and Custody

Monthly application and redemption timelines



Mode of Application/Redemption

2.1 Applications for Savings Bonds and requests to redeem Savings Bonds must be made through the following banks: DBS/POSB, OCBC and UOB ("Participating Banks"). Applications and redemption requests must be submitted either through the ATM networks or Internet banking systems of Participating Banks. Applications may also be submitted through OCBC's mobile application. Paper submissions or application over bank counters are not permitted.

2.2 CPFIS and SRS applications are not eligible.

2.3 Individuals shall submit their desired application/redemption amount in multiples of S\$500, with a minimum of S\$500. Individuals may also be required to provide their CDP account number, if this information has not already been provided.

2.4 Applicants should note that their bank may disclose their name, NRIC number, bank account number, nationality, CDP securities account number and other information related to their Savings Bonds application to CDP and MAS for the purpose of processing their applications. Additionally, should they wish to redeem Savings Bonds before maturity, CDP may disclose their holdings of each Savings Bond to their bank so that their bank can verify their holdings prior to processing their redemption request.

Application Requirements & Fees

- 2.5 Individuals require the following accounts to submit application and redemption requests:
- a. A deposit account with one of the Participating Banks. The account must have ATM banking and/or Internet banking enabled, as the case may be.
 - b. An individual securities deposit account with CDP that has Direct Crediting Service (“DCS”) enabled. Joint securities deposit accounts, and individual securities deposit accounts without DCS, are not permitted.
- 2.6 Banks charge a non-refundable S\$2 transaction fee per application and redemption request. This fee is deducted upon the submission of the application or redemption request, and is levied regardless of whether the application or redemption request is successful.

Application & Redemption Periods

- 2.7 MAS will publish a public notice on the SGS website (www.sgs.gov.sg) and the Savings Bond website (www.sgs.gov.sg/savingsbonds) after 4.30pm on the first business day of each month, which shall invite applications for the new Savings Bond issue and redemptions for all outstanding Savings Bonds. Information on the upcoming Savings Bond will also be available in the newspapers the following day.
- 2.8 Application and redemption requests may be made from 6.00pm following the publication of MAS’ notice on the SGS website. Individuals may submit these requests from 7.00 am to 9.00 pm on Mondays to Saturdays, except on public holidays. Application and redemption requests will be accepted until the end of the fourth business day before the end of the month.

Allotment & Settlement of Issuance/Redemption

- 2.9 MAS shall allot the new Savings Bond issue amongst applicants three business days before the end of the month, and publish a summary of the results on the SGS website after 3.00pm on that day. MAS will also publish this summary in the Straits Times and Business Times the following day. Please refer to Section 3 for more information on allotment.
- 2.10 Banks shall refund the excess amount from unsuccessful or partially successful applications by the end of the second business day before the end of the month.
- 2.11 Settlement of issuance and redemption shall occur on the first business day of the following month. Redemption proceeds shall be paid to individuals by the second business day of the following month. CDP will inform individuals of their successful applications and redemptions by mail.

Custody

- 2.12 Individuals’ Savings Bonds are held in their accounts with CDP, which, in turn, holds these Bonds on a consolidated basis in its account in MAS’ MEPS+ System.

3. Method of Allotment

3.1 Savings Bonds shall be allocated according to the Quantity Ceiling format. Applications shall first be screened against applicants' existing bond holdings to obtain the total "adjusted application amount". The maximum amount each applicant can be allotted shall be adjusted to be within his/her per issue and individual limit. Applicants that have already reached their individual limit (after accounting for redemption and maturity) shall not be allotted any new Savings Bonds.

3.2 Should the total adjusted application amount be less than or equal to the amount of Savings Bonds on offer, all adjusted applications shall be filled and the excess Savings Bonds, if any, shall not be issued.

3.3 Should the total adjusted application amount exceed the amount of Savings Bonds on offer (i.e. an "over-subscription"):

- If it is possible to allot S\$500 to each applicant, each applicant shall be allotted S\$500 of Savings Bonds, where possible, up till his/her adjusted application amount. Applicants that have been allotted Savings Bonds equal to their adjusted application amounts shall not be allocated any more Savings Bonds.
- Step (a) shall be repeated until it is no longer possible to allot S\$500 of Savings Bonds to every applicant.
- The remaining amount of Savings Bonds, if any, shall be divided into denominations of S\$500, which shall be allotted at random amongst all remaining applicants.

The allotment mechanism in case of over-subscription is illustrated in the simple example below:

Allotment in an over-subscription - an illustration

Total available: \$10,000 Total applied: \$18,000 Cut-off: \$2,500

Amount applied	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Random	Amount allotted
A \$2,000	\$500	\$500	\$500	\$500				\$2,000
B \$4,000	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$2,500
C \$5,500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$3,000
D \$6,500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$2,500

The Government plans to issue up to \$10,000 of Savings Bonds. Four individuals A (\$2,000), B (\$4,000) C (\$5,500) and D (\$6,500) applied for a total of \$18,000 of Savings Bonds.

The available bonds will be spread out among as many investors as possible in the following manner:

- Applications are filled in denominations of \$500 upwards.
- After Round 4, \$8,000 of Savings Bonds have been allotted, and A's application has been fully met. \$2,000 of Savings Bonds are left.
- In Round 5, \$1,500 of Savings Bonds are allotted.
- The remaining \$500 is insufficient to fill all applications in Round 6. One person amongst B, C and D is randomly allotted the remaining \$500. In this case, C gets the \$500.

A is allotted \$2,000, B and D receive \$2,500 each, and C gets \$3,000.

4. Interest Rates of Savings Bonds

Determining Step-up Coupon Rates

4.1 Coupon rates for each issuance of Savings Bonds are determined such that the return over an investor's investment period is linked to long-term Singapore Government Securities (SGS) yields. The investor's average annual compounded return over a holding period (e.g. 5 years) should correspond to yield to maturity of a corresponding SGS (e.g. 5 year SGS). There may be two exceptions to this:

- a. The first exception is due to very small rounding differences of up to +/- 0.03% that may arise in the computation of average returns for Savings Bonds.
- b. The second exception may arise from time to time if the shape of the SGS yield curve does not allow the interest rates to step-up. In such instances, the design of the Savings Bond prioritises the "step-up" feature of the interest rates over the matching to SGS yields for a given year, and this is explained in Paras 4.4 to 4.6. This is because the objective of the Savings Bond programme is to encourage and facilitate long-term savings and investment. An adjustment is made so that the interest payments do not step down in any year. This adjustment does not affect the return on the Savings Bond if it is held for the full 10 years.

4.2 For the purpose of calculating the Step-up Coupon rates for Savings Bonds, the one, two, five and ten-year benchmark SGS yields are used as reference. These reference yields will be based on the simple average of the respective daily SGS benchmark yields from the month before the public notice of issuance (the "reference SGS yields"), as provided on the "Daily SGS Prices" page of the SGS website (<https://secure.sgs.gov.sg/fdanet/SgsBenchmarkIssuePrices.aspx>). Reference SGS yields for tenors between the benchmark issuances are interpolated using a hermite spline function.

4.3 The coupon rate for each year of the Savings Bond's tenor shall be derived from the SGS reference yields as follows:

Savings Bond coupons satisfy the no-arbitrage rule, in that (i) the bond can be redeemed at any point of time at a face value of 1, (ii) the bond pays the same effective yield as a SGS bond for the same holding period.

Simplifying assumptions: Assume one coupon paid at the end of each year (In practice, there are two coupons each year, which are half of the coupon rate as determined by the calculation below).

- a. *Bootstrap the Risk-Free Yield Curve:* Given a SGS yield curve (Y_1, Y_2, \dots, Y_{10}), solve for Discount Factors ($DF_1, DF_2, \dots, DF_{10}$)

$$1 = \frac{1 + Y_1}{1 + r_1} = (1 + Y_1)DF_1 \Rightarrow DF_1 = \frac{1}{1 + Y_1}$$

$$1 = \frac{Y_2}{1 + r_1} + \frac{1 + Y_2}{(1 + r_2)^2} = Y_2DF_1 + (1 + Y_2)DF_2 \Rightarrow DF_2 = \frac{1 - Y_2DF_1}{1 + Y_2}$$

$$1 = \frac{Y_n}{1 + r_1} + \dots + \frac{1 + Y_n}{(1 + r_n)^n} = Y_n(DF_1 + \dots + DF_{n-1}) + (1 + Y_n)DF_n$$

$$\Rightarrow DF_n = \frac{1 - Y_n(DF_1 + \dots + DF_{n-1})}{1 + Y_n}$$

- b. *Calculate Step-up Coupon Rates:* Using Discount Factors in (a), solve for Step-up Coupon Rates for each year (C_1, C_2, \dots, C_{10})

$$1 = \frac{1 + C_1}{1 + r_1} = DF_1(1 + C_1) \Rightarrow C_1 = \frac{1}{DF_1} - 1 = Y_1$$

$$1 = \frac{C_1}{1 + r_1} + \frac{1 + C_2}{(1 + r_2)^2} = DF_1(C_1) + DF_2(1 + C_2) \Rightarrow C_2 = \frac{1 - DF_1(C_1)}{DF_2} - 1$$

$$1 = \frac{C_1}{1 + r_1} + \dots + \frac{1 + C_n}{(1 + r_n)^n} = DF_1(C_1) + \dots + DF_n(1 + C_n)$$

$$\Rightarrow C_n = \frac{1 - DF_1(C_1) - \dots - DF_{n-1}(C_{n-1})}{DF_n} - 1$$

- c. *Calculate average annual compounded yield, R_{avg} , for each tenor*

$$1 = \frac{C_1}{1 + R_{avg}} + \frac{C_2}{(1 + R_{avg})^2} + \dots + \frac{1 + C_n}{(1 + R_{avg})^n}$$

Solve for R_{avg} for each tenor.

Adjustments to Coupon Rates to Maintain Step-Up Interest Feature

4.4 Depending on the shape of the prevailing SGS yield curve, there may be certain occasions where the reference SGS yields do not allow a particular Savings Bond issue to have a monotonically increasing step-up interest feature (i.e. the implied coupon rates based on the reference SGS yields may decrease over part or all of the issue's tenor). These occasions could occur when:

- Some or all of the longer-dated reference yields are lower than shorter-dated reference yields (an "inverted yield curve"); and/or
- A particular reference yield is much higher than the one immediately before it, but not much lower than the one immediately after (e.g. the five-year yield is much higher than the two-year yield, but not far below the ten-year yield). This is known as a "highly convex yield curve".

4.5 Should the reference yields not allow for step-up coupons, MAS shall lower the coupon rates by the minimum amount necessary (subject to the mathematical programming function below), to maintain a weakly monotonically increasing step-up coupon schedule. This is in line with the intent of Savings Bonds, which are to encourage long-term savings. This adjustment is akin to reducing the size of the coupons in earlier years, and increasing the size of the coupons in later years, while adjusting for the time value of money based on the risk-free discount rates.

$$\min_{\alpha_1, \alpha_2, \dots, \alpha_{10}} \sum_{t=1}^{10} e_t^2 \text{ for each } t \in [1, 10]$$

Subject to

$$e_t = 1 - \frac{1}{(1+r_t)^t} - \sum_{i=1}^t \frac{\sum_{j=1}^i \alpha_j}{(1+r_t)^i} \text{ for } t \in [1, 10]$$

where $\alpha_1 = C_1, \alpha_2 = C_2 - C_1, \dots, \alpha_{10} = C_{10} - C_9$; $e_t \geq 0$ for $t \in [1, 9]$, $e_{10} = 0$,

and $\alpha_t \geq 0$ for $t \in [1, 10]$.

4.6 These adjustments may cause the average annual compounded return on the particular Savings Bond issue over one, two or five years to be less than the one, two and five-year reference yields. However, the adjustments will not affect the issue's return if held to maturity, which shall always equal the ten-year reference yield (subject to slight differences of up to +/- 0.03% due to rounding in the computation of the step-up coupons).

Calculation of Coupons & Accrued Interest

4.7 **Coupons:** Savings Bonds pay coupons twice a year. The amount paid in each coupon is calculated using the following formula-

$$\text{Coupon Payment} = (\text{CPN}/2) \times H$$

Where: CPN = Annual coupon rate (as a percentage)
H = Investor's holdings

Note: An exception is made for the first coupon payment of a Savings Bond, if the Savings Bond was not issued on the first calendar day of the month². In this case, the first coupon payment of the Savings Bond will be calculated as follows-

$$\text{First Coupon Payment} = (\text{CPN} / 2) \times (\text{DC}/\text{PC}) \times H$$

Where: CPN = Annual coupon rate (as a percentage)
DC = Number of days between issuance date and first coupon date
PC = Number of days between the first calendar day of the issuance month, and the first calendar day of the coupon payment month
H = Investor's holdings

For avoidance of doubt, subsequent coupon payments would not be affected by this exception.

4.8 **Accrued interest:** While coupons are paid every 6 months, an investor may redeem part or all of his/her Savings Bonds in any given month, and receive accrued interest together with the repayment of principal if the redemption pay-out date falls between the scheduled coupons. The accrued interest paid out on each redemption date is calculated as follows-

$$\text{Accrued Interest} = (\text{CPN} / 2) \times (\text{DC}/\text{PC}) \times H$$

Where: CPN = Annual coupon rate (as a percentage) and not more than 2 decimal places
DC = Number of days between last coupon payment and redemption date
PC = Total number of days for the current coupon period
H = Value of Savings Bonds redeemed

² Savings Bonds are issued on the first business day of the month. This may not always be the first calendar day of the month.

5. Tax

5.1 Savings Bonds are considered Qualifying Debt Securities (“QDS”) eligible for the tax incentives approved by the Minister for Finance for QDS issued up till 31 December 2018.

5.2 Interest and other qualifying income derived by individuals, whether they are resident or non-resident in Singapore, in respect of QDS issued from 28 February 1998 till 31 December 2018 (both dates inclusive) are exempted from tax, except where such income is derived through a partnership in Singapore or is derived from the carrying on of a trade, business or profession.

5.3 Tax exemption shall not apply on interest, discount, break cost, prepayment fee or redemption premium derived from QDS issued up till 31 December 2018 by any non-resident investor who carries on any operation in Singapore through a permanent establishment in Singapore, if the debt securities are purchased using funds from Singapore operations. Persons who are not exempted from tax are required to declare their income received from the debt securities in their income tax returns.

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