

INDEX GUIDELINE

Solactive MBS USD Index

Version 1.1

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INTRODUCTION

This document (the "GUIDELINE") is to be used as a guideline with regard to the composition, calculation and maintenance of the Solactive MBS USD Index (the "INDEX"). Any amendments to the rules made to the GUIDELINE are approved by the OVERSIGHT COMMITTEE specified in Section 5.5. The INDEX is owned, calculated, administered and published by Solactive AG ("SOLACTIVE") assuming the role as administrator (the "INDEX ADMINISTRATOR") under the Regulation (EU) 2016/1011 (the "BENCHMARK REGULATION" or "BMR"). The name "Solactive" is trademarked.

The text uses defined terms which are formatted with "SMALL CAPS". Such Terms shall have the meaning assigned to them as specified in Section 6 (Definitions).

The GUIDELINE and the policies and methodology documents referenced herein contain the underlying principles and rules regarding the structure and operation of the INDEX. SOLACTIVE does not offer any explicit or tacit guarantee or assurance, neither pertaining to the results from the use of the INDEX nor the level of the INDEX at any certain point in time nor in any other respect. SOLACTIVE strives to the best of its ability to ensure the correctness of the calculation. There is no obligation for SOLACTIVE – irrespective of possible obligations to ISSUERS – to advise third parties, including investors and/or financial intermediaries, of any errors in the INDEX. The publication of the INDEX by SOLACTIVE does not constitute a recommendation for capital investment and does not contain any assurance or opinion of SOLACTIVE regarding a possible investment in a financial instrument based on this INDEX.



1. INDEX SPECIFICATIONS

1.1. SCOPE OF THE INDEX

- > The Index aims to track the performance of the USD denominated MBS issued by US agencies (AGENCY).
- > The Index is rebalanced monthly.
- > INDEX COMPONENTS are weighted according to their respective Market Values in proportion to the aggregated Market Value of all INDEX COMPONENTS in the index.
- > The index currency is USD.

1.2. IDENTIFIERS AND PUBLICATION

The INDEX is published under the following identifiers:

Name	ISIN	Currency	Type	RIC	BBG ticker
Solactive MBS USD Index	DE000SLOAYE6	USD	GTR	.SOLMBSUS	N/A

*GTR means that the INDEX is calculated as Gross Total Return index as described in the Bond Index Methodology, which is available on the SOLACTIVE website: <https://www.solactive.com/documents/bond-index-methodology/>

The INDEX is published on the website of the INDEX ADMINISTRATOR (www.solactive.com) and is, in addition, available via the price marketing services of Boerse Stuttgart AG and may be distributed to all of its affiliated vendors. Each vendor decides on an individual basis as to whether it will distribute or display the INDEX via its information systems.

Any publication in relation to the INDEX (e.g. notices, amendments to the GUIDELINE) will be available at the website of the INDEX ADMINISTRATOR: <https://www.solactive.com/news/announcements/>.

1.3. INITIAL LEVEL OF THE INDEX

The initial level of the INDEX on July 2nd 2020 is 1001.50. Before this date the index values are backtested until December 31st 2014. Historical values will be recorded in accordance with Article 8 of the BMR.

1.4. PRICES AND CALCULATION FREQUENCY

The INDEX is calculated and distributed once every BUSINESS DAY based on the LAST EVALUATED BID PRICE of the INDEX COMPONENTS. Bonds added in a rebalancing (see Section 3) are included the INDEX at the LAST EVALUATED ASK PRICE on the relevant REBALANCE DAY (as specified in Section 3.3). Bonds which are excluded from the INDEX in a rebalance are reflected in the calculation of the level of the INDEX for the REBALANCE DAY



at the LAST EVALUATED BID PRICE on the relevant REBALANCE DAY. INDEX analytical values are calculated each BUSINESS DAY using the LAST EVALUATED BID PRICE based on FIXING TIME.

1.5. LICENSING

Licenses to use the INDEX as the underlying value for financial instruments, investment funds and financial contracts may be issued to stock exchanges, banks, financial services providers and investment houses by Solactive AG.

1.6. CONFLICTS OF INTEREST

There are no conflicts of interest identified for this index.



2. INDEX SELECTION

On each SELECTION DAY, all bonds which meet the INDEX COMPONENT REQUIREMENTS are eligible for inclusion in the INDEX and will be added as INDEX COMPONENT on the REBALANCE DAY. Additionally, on each SELECTION DAY, it will be evaluated whether all current INDEX COMPONENTS still meet the INDEX COMPONENT REQUIREMENTS. Each INDEX COMPONENT that does not meet the INDEX COMPONENT REQUIREMENTS will be removed from the INDEX on the next REBALANCE DAY.

2.1. SELECTION OF THE INDEX COMPONENTS

The initial composition of the INDEX, as well as any selection for a rebalance (as specified in Section 3) is determined using the following rules:

- Only active senior tranches of MBS issued by AGENCIES are eligible for selection.
- The MBS must be denominated in USD.
- TIME TO MATURITY of the MBS more than 1 year from the REBALANCE DAY.
- CURRENT BALANCE of the MBS must be higher than USD 2 000 000 000.
- Only active, fixed coupon MBS are eligible for selection
- FUNGIBLE STRIPS, PRINCIPAL ONLY STRIPS and INTEREST ONLY STRIPS are excluded.
- A price from the PRICING PROVIDER must be available for each INDEX COMPONENT on each SELECTION DAY
(the "INDEX COMPONENT REQUIREMENTS")]

The determination of the INDEX COMPONENTS is fully rule-based and the INDEX ADMINISTRATOR has no discretion.

2.2. WEIGHTING OF THE INDEX COMPONENTS

On each REBALANCE DAY each INDEX COMPONENT is weighted using the market value based on the LAST EVALUATED BID PRICE and accrued interest as on the SELECTION DAY in order to achieve the aim of the INDEX. The weighting of the INDEX COMPONENTS will be as follows:

The INDEX COMPONENTS are weighted according to their respective Market Values in proportion to the aggregated Market Value of all INDEX COMPONENTS in the index.



3. REBALANCE

3.1. ORDINARY REBALANCE

In order to reflect the new selection of the INDEX COMPONENTS determined on the SELECTION DAY (in accordance with Section 2.1) the INDEX is adjusted on the REBALANCE DAY after CLOSE OF BUSINESS.

For more information on the rebalance procedure please refer to the Bond Index Methodology, which is incorporated by reference and available on the SOLACTIVE website: <https://www.solactive.com/documents/bond-index-methodology/>.

SOLACTIVE will publish any changes made to the INDEX COMPONENTS with sufficient notice before the REBALANCE DAY on the SOLACTIVE webpage under the section "[Announcement](#)", which is available at <https://www.solactive.com/news/announcements/>

3.2. EXTRAORDINARY REBALANCE

The INDEX is not rebalanced extraordinarily.



4. CALCULATION OF THE INDEX

4.1. INDEX FORMULA

The INDEX is calculated as a gross total return Index.

A gross total return index seeks to replicate the overall return from holding an index portfolio, thus considering both coupon payments and Corporate Action proceeds in addition to the price changes adjusted for any accrued interest. Coupon and other cash payments will be reinvested on the monthly basis.

The periodic reinvestment formula implies a periodic reinvestment in the INDEX of proceeds resulting from corporate actions and coupon payments in respect of the INDEX COMPONENTS on the next regular REBALANCE DAY following such events. For the period until reinvestment the proceeds are held in a cash component. On the REBALANCE DAY the proceeds are reinvested in the INDEX proportionately to the weights of the INDEX COMPONENTS. The periodic reinvestment formula tracks the performance of the INDEX COMPONENTS relative to their market value on the immediately preceding REBALANCE DAY. The market value for an individual INDEX COMPONENT on a REBALANCE DAY is based on the price for the respective bond and its face value on the SELECTION DAY associated with the REBALANCE DAY.

The intra-month cash payments and prepayments of the MBS are paid with one month delay, using the Cap Factor and the Pool Factor as of the day when the payment was scheduled. For example, if a coupon payment was scheduled on the 1st of May, the coupon payment will be paid on the 1st of June. The calculation of the Index is reflected in the formulas below:

$$Index_t = Index_n \cdot \frac{MarketValue_t + Cash_t}{BaseValue_n}$$

where:

$$BaseValue_n = \sum_{i=1}^a (Price_{i,n} + AI_{i,n} + CAP_{i,n} + CPAdj_{i,n}) \cdot Factor_{i,n} \cdot Amt_{i,SD} \cdot CF_{i,SD} \cdot FX_{i,n} \cdot IR_{i,n}$$

$$MarketValue_t = \sum_{i=1}^a (Price_{i,t} + AI_{i,t} + CAP_{i,t} + CPAdj_{i,t}) \cdot Factor_{i,t} \cdot Amt_{i,SD} \cdot CF_{i,SD} \cdot FX_{i,t} \cdot IR_{i,t}$$



$$Cash_t = CashCoupon_t + Prepayment_t + CashCA_t$$

$$CashCoupon_t = \sum_{i=1}^a CashCoupon_{i,t-1} + \sum_{i=1}^a Coupon_{i,t} \cdot Factor_{i,CouponAppointment} \cdot Amt_{i,SD} \cdot CF_{i,CouponAppointment} \cdot FX_{i,t} \cdot IR_{i,t}$$

$$Prepayment_t = \sum_{i=1}^a Prepayment_{i,t-1} + \sum_{i=1}^a FactorPayment_{i,Paydate} \cdot Amt_{i,SD} \cdot CF_{i,Paydate} \cdot FX_{i,t} \cdot IR_{i,t}$$

$$CashCA_t = \sum_{i=1}^a CashCA_{i,t-1} + \sum_{i=1}^a (RedemptionPrice_{i,t} + AI_{i,t} + CAP_{i,t} + CPAdj_{i,t}) \cdot Factor_{CAdate,t-1} \cdot Amt_{i,SD} \cdot CF_{i,CAdate} \cdot FX_{i,t}$$

Where:

<i>a</i>	Number of bonds in the Index
<i>AI_{i,t}</i>	Interest accrued of bond <i>i</i> on Business Day <i>t</i>
<i>Amt_{i,t}</i>	Amount Outstanding of bond <i>i</i> on Business Day <i>t</i>
<i>BaseValue_n</i>	Base Market Value of the Index as of Rebalance Day <i>n</i>
<i>CAP_{i,t}</i>	Capitalization Rate of bond <i>i</i> on Business Day <i>t</i> (only relevant for Capitalizing Bonds, otherwise the default value is zero)
<i>CAdate</i>	Is the date when the corporate action is effective
<i>CF_{i,SD}</i>	Capping factor of bond <i>i</i> on Selection Day :



	Fixed on the immediately preceding Selection Day and defined as a parameter used to scale the weight of the bond
$CPAdj_{i,t}$	Variable Coupon Adjustment Factor of bond i on Business Day t : If the bond is included in the Index during the Ex-Dividend Period, the factor is zero; if the bond is a constituent of the Index during the Ex-Dividend Period, the Variable Coupon Adjustment Factor equals to the coupon value that will be paid on the next coupon date (only relevant for bonds with Ex-Dividend Period, otherwise default value is zero)
$CashCA_t$	Aggregated cash consisting of all repayments resulting from Corporate Actions effective up to and including Business Day t
$CashCoupon_t$	Aggregated cash consisting of all coupon payments made by the Index Components up to and including Business Day t
$Cash_t$	Aggregated cash consisting of all payments made by the Index Components up to and including Business Day t . In relation to Price Return Indices the term $Cash$ includes cash derived from payments resulting from Corporate Actions and early repayments of Sinkable Bonds, while Total Return Indices reflect coupon payments in addition to that. On the immediately following Rebalance Day, $Cash$ is reinvested into the Index and the value is set to zero
$Cash_{i,t}$	Cash consisting of all payments made by bond i on Business Day t . On the immediately following Business Day, $Cash$ is reinvested into the Index and the value is set to zero
$Coupon_{i,t}$	Coupon value of bond i on Business Day t
$Coupon Appointment$	Is the date when the coupon of an MBS was scheduled to be paid. The actual date of coupon payment is normally delayed
$FactorPayment_t$	Value of the prepayment of MBS i on Business Day t . The Factor Payment is calculated as: $Factor Payment_{i,t} = (Factor_{i,previouspaydate} - Factor_{i,payate}) \cdot Price_{i,t}$
$Factor_{i,t}$	Pool Factor of MBS i on the Business Day t



$Factor_{i,n}$	Pool Factor of MBS i on Rebalance Day n
$Factor_{i,previouspaydate}$	Pool Factor as of the previous payment period, i.e. the period which the previous prepayment is linked to
$Factor_{i,paydate}$	Pool Factor as of the payment period, i.e. the period which the prepayment is linked to
$FX_{i,t}$	Exchange rate of bond i currency against the Index Currency on Business Day t
$IR_{i,t}$	Inflation ratio of bond i on Business Day t (only relevant for Inflation-Linked Bonds, otherwise the default value is one)
$Index_t$	Index Level on Business Day t
$MarketValue_t$	Market Value of Index on Business Day t
n	Last Rebalance Day
$Prepayment_t$	Aggregated cash consisting of all early repayments of all MBS securities up to and including Business Day t
$PriceReturn_{i,t}$	Price Return of bond i on Business Day t
$Price_{i,t}$	Clean Price of bond i on Business Day t
$RedemptionPrice_{i,t}$	Price at which bond i is redeemed as a result of a Corporate Action effective on Business Day t
SD	Last Selection Day
t	Business Days between two regular Rebalance Days
$TotalReturn_{i,t}$	Total Return of bond i on Business Day t
$Weight_{i,t}$	Weight of bond i on Business Day t

4.2. ACCURACY

The level of the INDEX will be rounded to 2 decimal places. The amount outstanding per bond instrument will be rounded to 0 decimal places. The Last Evaluated Price of a bond instrument will be rounded to 4



decimal places, when expressed as a percentage of par (for example 99.17542466 will be rounded to 99.1754). The accrued interest per bond instrument will be used according to market convention for each Index Component.

4.3. ADJUSTMENTS

Under certain circumstances, an adjustment of the INDEX may be necessary between two regular REBALANCE DAYS. Basically, such adjustment needs to be done if a corporate action (as specified in Section 4.4 below) in relation to an INDEX COMPONENT occurs. Such adjustment may need to be done in relation to an INDEX COMPONENT and/or may also affect the number of INDEX COMPONENTS and/or the weighting of certain INDEX COMPONENTS and will be made in compliance with the Bond Index Methodology, which is available which is available on the SOLACTIVE website: <https://www.solactive.com/documents/bond-index-methodology/>.

4.4. CORPORATE ACTIONS

As part of the INDEX maintenance SOLACTIVE will consider various events – also referred to as corporate actions – which result in an adjustment to the INDEX between two regular REBALANCE DAYS. Such events have a material impact on the price, weighting or overall integrity of INDEX COMPONENTS. Therefore, they need to be accounted for in the calculation of the INDEX. Corporate actions will be implemented from the cum-day to the ex-day of the corporate action, so that the adjustment to the INDEX coincides with the occurrence of the price effect of the respective corporate action.

Adjustments to the INDEX to account for corporate actions will be made in compliance with the Bond Index Methodology, which is available which is available on the SOLACTIVE website: <https://www.solactive.com/documents/bond-index-methodology/>. This document contains for each corporate action a brief definition and specifies the relevant adjustment to the INDEX variables.

While SOLACTIVE aims at creating and maintaining its methodology for treatment of corporate actions as generic and transparent as possible and in line with regulatory requirements, it retains the right in accordance with the Bond Index Methodology to deviate from these standard procedures in case of any unusual or complex corporate action or if such a deviation is made to preserve the comparability and representativeness of the INDEX over time.

Solactive considers following, but not conclusive, list of corporate actions as relevant for INDEX maintenance:

- > Early Redemption (an event that leads to a redemption of a bond before the regular maturity date)
- > Flat Trading (e.g. a bond ISSUER fails to meet its coupon payment obligation)
- > Bond Default (e.g. when the ISSUER fails to meet its coupon payment obligation or repay the principal at maturity)



- > Tender Offers (a holder of a bond is invited to tender the bond for a specific price at a specific time before the regular maturity date)
- > Exchange Offers (type of a tender offer where the ISSUER offers its bondholders to exchange their existing bonds for an asset other than cash)
- > Distressed Debt Exchange (form of debt exchange when bondholders agree to reduce the principal amount of debt securities in order to obtain higher payment priority in the form of secured debt)
- > Bond Funge (bond issue that is attached to an existing one (parent bond). On a defined date the parent bond absorbs the funged bond)
- > Bond Maturity

4.5. RECALCULATION

SOLACTIVE makes the greatest possible efforts to accurately calculate and maintain its indices. However, errors in the determination process may occur from time to time for variety reasons (internal or external) and therefore, cannot be completely ruled out. SOLACTIVE endeavors to correct all errors that have been identified within a reasonable period of time. The understanding of "a reasonable period of time" as well as the general measures to be taken are generally depending on the underlying and is specified in the Solactive Correction Policy, which is incorporated by reference and available on the SOLACTIVE website: <https://www.solactive.com/documents/correction-policy/>.

4.6. MARKET DISRUPTION

Market stress can arise due to a variety of reasons, but generally results in inaccurate or delayed prices for one or more INDEX COMPONENTS. The determination of the INDEX may be limited or impaired at times of illiquid or fragmented markets and market stress.



5. MISCELLANEOUS

5.1. DISCRETION

Any discretion which may need to be exercised in relation to the determination of the INDEX (for example the determination of the INDEX COMPONENTS or any other relevant decisions in relation to the INDEX) shall be made in accordance with strict rules regarding the exercise of discretion or expert judgement established by the INDEX ADMINISTRATOR.

5.2. METHODOLOGY REVIEW

The methodology of the INDEX is subject to regular review, at least annually. In case a need of a change of the methodology has been identified within such review (e.g. if the underlying market or economic reality has changed since the launch of the INDEX, i.e. if the present methodology is based on obsolete assumptions and factors and no longer reflects the reality as accurately, reliably and appropriately as before), such change will be made in accordance with the Methodology Policy, which is incorporated by reference available on the SOLACTIVE website: <https://www.solactive.com/documents/methodology-policy/>.

Such change in the methodology will be announced on the SOLACTIVE webpage under the Section "Announcement", which is available at <https://www.solactive.com/news/announcements/>. The date of the last amendment of this INDEX is contained in this GUIDELINE.

5.3. CHANGES IN CALCULATION METHOD

The application by the INDEX ADMINISTRATOR of the method described in this document is final and binding. The INDEX ADMINISTRATOR shall apply the method described above for the composition and calculation of the INDEX. However, it cannot be excluded that the market environment, supervisory, legal, financial or tax reasons may require changes to be made to this method. The INDEX ADMINISTRATOR may also make changes to the terms and conditions of the INDEX and the method applied to calculate the INDEX that it deems to be necessary and desirable in order to prevent obvious or demonstrable error or to remedy, correct or supplement incorrect terms and conditions. The INDEX ADMINISTRATOR is not obliged to provide information on any such modifications or changes. Despite the modifications and changes, the INDEX ADMINISTRATOR will take the appropriate steps to ensure a calculation method is applied that is consistent with the method described above.



5.4. TERMINATION

SOLACTIVE makes the greatest possible efforts to ensure the resilience and continued integrity of its indices over time. Where necessary, SOLACTIVE follows a clearly defined and transparent procedure to adapt index methodologies to changing underlying markets (see Section 5.2 "Methodology Review") in order to maintain continued reliability and comparability of the indices. Nevertheless, if no other options are available the orderly cessation of the INDEX may be indicated. This is usually the case when the underlying market or economic reality, which the INDEX is set to measure or to reflect, changes substantially and in a way not foreseeable at the time of inception of the INDEX, the INDEX rules, and particularly the selection criteria, can no longer be applied coherently or the INDEX is no longer used as the underlying value for financial instruments, investment funds and financial contracts.

SOLACTIVE has established and maintains clear guidelines on how to identify situations in which the cessation of the INDEX is unavoidable, how stakeholders are to be informed and consulted and the procedures to be followed for a termination or the transition to an alternative index. Details are specified in the Solactive Termination Policy, which is incorporated by reference and available on the SOLACTIVE website: <https://www.solactive.com/documents/termination-policy/>.

5.5. OVERSIGHT

An oversight committee composed of staff from SOLACTIVE and its subsidiaries (the "OVERSIGHT COMMITTEE") is responsible for decisions regarding any amendments to the rules of the INDEX. Any such amendment, which may result in an amendment of the GUIDELINE, must be submitted to the OVERSIGHT COMMITTEE for prior approval and will be made in compliance with the Methodology Policy, which is available on the SOLACTIVE website: <https://www.solactive.com/documents/methodology-policy/>.

6. DEFINITIONS

"AGENCY" are the issuers with tickers FNMA, GNMA and FHLMC.

"BENCHMARK REGULATION" shall have the meaning as defined in Section "Introduction".

"BMR" shall have the meaning as defined in Section "Introduction".

"BUSINESS DAY" is in relation to the index is each day, Monday to Friday, except banking holidays as defined by the New York Stock Exchange (NYSE) and SIFMA.

"CLOSE OF BUSINESS" is a time stamp when an INDEX is calculated.

"CURRENT BALANCE" is total outstanding balance of a MBS.



"FIXING TIME" is the time when the prices for the INDEX COMPONENTS are fixed for index calculation. This is specified in the Bond Index Methodology, which is available on the SOLACTIVE website: <https://www.solactive.com/documents/bond-index-methodology/>.

"FUNGIBLE STRIPS" are securities where the principal and interest rate cash flows have been separated.

"GUIDELINE" shall have the meaning as defined in Section "Introduction".

"INDEX" shall have the meaning as defined in Section "Introduction".

"INDEX ADMINISTRATOR" shall have the meaning as defined in Section "Introduction".

"INDEX CALCULATOR" is SOLACTIVE or any other appropriately appointed successor in this function.

"INDEX COMPONENT" is each bond reflected in the INDEX.

"INDEX COMPONENT REQUIREMENTS" shall have the meaning as defined in Section 2.1.

"INDEX CURRENCY" is the currency specified in the column "Currency" in the table in Section 1.2.

"ISSUER" is the issuing entity of the respective bond.

"INTEREST ONLY STRIPS" are fixed income securities which represent only the interest part of a bond.

"LAST EVALUATED ASK PRICE" the last available evaluated ask price by the designated PRICING PROVIDER.

"LAST EVALUATED BID PRICE" the last available evaluated bid price by the designated PRICING PROVIDER.

"LAST EVALUATED MID PRICE" is the average between LAST EVALUATED ASK PRICE and LAST EVALUATED BID PRICE.

"MBS" (mortgage-backed security) is a security which has the cashflows linked to a pool of loans bought from the banks that issued them.

"OVERSIGHT COMMITTEE" shall have the meaning as defined in Section 5.5.

"PRICING PROVIDER" is Interactive Data Corporation part of the ICE group.

"PRINCIPLE ONLY STRIP" are securities which represent only the principal cash flow of a bond

"REBALANCE DAY" is the last BUSINESS DAY of the month.

"SELECTION DAY" is 8 BUSINESS DAYS before the scheduled REBALANCE DAY,

"SOLACTIVE" shall have the meaning as defined in Section "Introduction".

"TIME TO MATURITY" is measured from the REBALANCE DAY

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