

Guideline

Solactive USD Liquid High Yield Enhanced Corporate Index

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This document contains the underlying principles and regulations regarding the structure and operation of the Solactive USD Liquid High Yield Enhanced Corporate Index. Solactive AG shall make every effort to implement the relevant regulations. Solactive AG does not offer any explicit or tacit guarantee or assurance, neither pertaining to the results from the use of the index nor the index value at any given point in time nor in any other respect. The Solactive USD Liquid High Yield Enhanced Corporate Index is the sole property of Solactive AG. Solactive AG strives to the best of its ability to ensure the correctness of the calculation. There is no obligation for Solactive AG – irrespective of possible obligations to issuers – to advise third parties, including investors and/or financial intermediaries, of any errors in the index. The calculation and publication of the index by Solactive AG is not a recommendation for capital investment and does not contain any assurance or opinion of Solactive AG regarding a possible investment in a financial instrument based on this index.

Introduction

This document is to be used as a guideline with regard to the composition, calculation and management of the Solactive USD Liquid High Yield Enhanced Corporate Index. Any changes made to the guideline are initiated by the Committee specified in section 1.6. The Solactive USD Liquid High Yield Enhanced Corporate Index is the sole property of Solactive AG. The Solactive USD Liquid High Yield Enhanced Corporate Index is calculated and published by Solactive AG. The name "Solactive" is copyrighted.

1 Index specifications

The Solactive USD Liquid High Yield Enhanced Corporate Index is a rules-based index. The Index is engineered to exploit the return potential of US denominated corporate debt securities of the high-yield segment (see 4.2 further Definitions) using a stratified sampling approach with a yield enhancement feature. The index seeks to replicate the Solactive USD High Yield Corporate Index (the Benchmark) with respect to the allocation of effective durations and composite ratings whilst increasing the average weighted yield to maturity. The number of index constituents is limited to 100 and the weight of the energy sector and finance sector is capped at 15%, respectively.

The Solactive USD Liquid High Yield Enhanced Corporate Index is a Total Return Index, i.e. coupon payments will be reinvested on a monthly basis in the index.

The composition of the index is reviewed on the Quarterly and Monthly Selection Day (see 2.2). Any change to the index will be implemented on the Quarterly and Monthly Adjustment Day.

1.1 Name and ISIN

The Solactive USD Liquid High Yield Enhanced Corporate Index is distributed under ISIN DE000SLA44H7; the WKN is SLA44H. The Index is published in Reuters under the code .SOLHYEC and in Bloomberg under the code SOLHYEC Index.

1.2 Initial value

The index will be calculated every Business Day starting on November 24, 2017. Before this date the index values are backfilled, with the index value based on 100 as at the close of trading on March 31, 2005.

1.3 Distribution

The Solactive USD Liquid High Yield Enhanced Corporate Index is published via the price marketing services of Boerse Stuttgart AG and is distributed to all affiliated vendors.

1.4 Prices and calculation frequency

The Solactive USD Liquid High Yield Enhanced Corporate Index is calculated based on the Evaluated Bid Price (see 4.2 Further Definitions) of the respective Index Components, whereas newly added bonds are added at the Evaluated Ask Price. The index is calculated and distributed once every Business Day. Bond and index analytical values are calculated each Business Days using the Last Evaluated Price.

Updated index values and other statistics will not be distributed. In the event that the data required for index calculation purposes is not available or that there are troubles regarding the price marketing of Solactive AG or Stuttgart Stock exchange the index cannot be distributed.

1.5 Weighting

On the Quarterly Selection Day, the weights of the Index Components are determined using a multi-level approach:

- 1) Bonds that are selected as defined in 2.1 for a component cell are weighted proportionally according to their Market Value within the component cell such as to equal the total weight of selected bonds in the cell to the weight of bonds in the Selection Pool in the component cell.
- 2) If the weight of the finance sector or energy sector is hereafter above 15%, the weight is capped to 15% in each case and the total excess weight is distributed pro rata across the bonds with a different sector attributed to them.
- 3) The final weighting is derived by re-allocating weights slightly through means of a linear constrained optimization. The purpose is to further enhance the average weighted yield of the index, which has been done in a first step by selecting the bonds with the highest yield to maturity for each component cell as defined in 2.1.

The average weighted yield to maturity of selected index components is maximized taking into account a set of linear constraints that are defined as follows:

- The weight per component cell in the index at that point is not allowed to defer by more than 5% from the starting weight per component cell in the index at step 2
- The final weight per bond is not allowed to be more than 5% higher than the maximum of weights allocated at step 2 and is not allowed to be more than 5% lower than the minimum of weights allocated at step 2
- To ensure that the optimization does not revoke the capping of step 2, the weight of bonds in the finance and energy sector is respectively limited to 15%
- The sum of weights must equal 100%

For the avoidance of doubt, on the Monthly Selection Day no reweighting occurs.

1.6 Decision-making bodies

A Committee composed of staff from Solactive AG is responsible for decisions regarding the composition of the Solactive USD Liquid High Yield Enhanced Corporate Index, as well as any amendments to the rules (hereinafter referred to as the “**Committee**” or the “**Index Committee**”). The Committee will also determine the future composition of the Solactive USD Liquid High Yield Enhanced Corporate Index if any Extraordinary Event (see chapter 2.3) occurs, as well as the implementation of any necessary adjustments.

Members of the Committee can recommend at any time changes to the composition of the Index or to the guideline and submit them to the Committee for approval. Any change of the guideline will be announced on the web page <http://www.solactive.com>.

1.7 Publication

All specifications and information relevant for calculating the index are made available on the <http://www.solactive.com> web page and sub-pages.

1.8 Historical data

Historical data will be maintained from March 31th 2005.

1.9 Licencing

Licences to use the index as the underlying value for derivative instruments are issued to stock exchanges, banks, financial services providers and investment houses by Solactive AG.

2 Composition of the Index

2.1 Selection of the Index Components

On the Quarterly Selection Day, all financial instruments that meet the requirements of the Selection Pool as described under 4.1 are eligible for inclusion in the index. Eligible bonds are placed into component cells applying a stratified sampling approach based on effective durations and composite numerical ratings as defined by Moody's and S&P.

A component cell is defined as a unique combination of the buckets that are defined respectively for each single parameter:

Effective duration buckets are defined as follows:

Bucket 1:	$D \leq 2$ years
Bucket 2:	$2 < D \leq 3$ years
Bucket 3:	$3 < D \leq 4$ years
Bucket 4:	$4 < D \leq 5$ years
Bucket 5:	$5 < D \leq 6$ years
Bucket 6:	$6 < D \leq 7$ years
Bucket 7:	$D > 7$ years

Rating buckets are defined by the composite rating (see 4.2 Further Definitions) as follows:

Bucket 1:	11
Bucket 2:	12
Bucket 3:	13
Bucket 4:	14
Bucket 5:	15
Bucket 6:	16
Bucket 7:	17
Bucket 8:	18
Bucket 9:	19

For each non-empty component cell c a target number of bonds nc is selected. To get integer numbers nc and obtain a total of $N=100$ index constituents, the target number of bonds to be selected per component cell is calculated by a three step procedure:

- 1) Compute nc^* for each component cell with $nc^* = \text{floor}(N^*wc)$, where wc denotes the market capitalization weight of bonds in component cell c in the Selection Pool as described under 4.1
- 2) Compute N^* with $N^* = \sum nc^*$
- 3) For the $(N-N^*)$ buckets with the highest residual $(N^*wc - nc^*)$: $nc = nc^* + 1$
- 4) For the remaining: $nc = nc^*$

For each component cell c , the target number of bonds for that cell nc is selected by choosing the nc bonds with the highest yield to maturity. If two bonds have the same yield to maturity in the same component cell, the bond with the lower effective duration is selected first.

Extraordinary adjustments are possible as described under 2.3.

2.2 Ordinary adjustment

The composition of the Index is ordinarily adjusted on the Quarterly and Monthly Adjustment Day.

Additionally, cash (e.g. resulting from coupon payments or corporate actions) is reinvested on the Quarterly and Monthly Adjustment Day.

The composition of the Index is ordinarily reviewed on the Quarterly and Monthly Selection Day, which is a Business Day 3 Business Days prior to the Quarterly or Monthly Adjustment Day, respectively.

On the Quarterly Selection Day, Index Components are selected as in 2.1 and weight capping factors are calculated such as to apply the weighting as defined in 1.5.

On the Monthly Selection Day, the composition of the index is reviewed with respect to a single aspect: Bonds that are deleted from the Solactive USD High Yield Corporate Index (The Benchmark) during the usual monthly rebalancing of the Benchmark, are also removed from the index at this Monthly Selection Day. The resulting payment is reinvested in the index on the corresponding Monthly Adjustment Day.

Solactive AG shall publish any changes made to the Index composition on the Business Day following the Quarterly or Monthly Selection Day (the Announcement Day) and consequently with sufficient notice before the Quarterly or Monthly Adjustment Day.

2.3 Extraordinary adjustment

The Index Committee will decide about the future composition and the implementation of any necessary adjustments of the Solactive USD Liquid High Yield Enhanced Corporate Index if an Extraordinary Event (early redemption, credit event etc.) regarding one or more index constituents occurs. See details under 3.3 Adjustments

The Index Committee will decide on the future composition of the Solactive USD Liquid High Yield Enhanced Corporate Index as well as the Business Day which marks the starting of the new adjusted index composition.

3 Calculation of the Index

3.1.1 Index formula

The Solactive USD Liquid High Yield Enhanced Corporate Index is an index whose value reflects the relative changes in bond values.

As a formula:

$$Index_t = Index_n \frac{MarketValue_t + PaidCash_t}{BaseValue_n}$$

$$MarketValue_t = \sum_{i=1}^a (DirtyPrice_{i,t} + CPA_{i,t}) \cdot Amount_{i,n} \cdot Capfactor_{i,rb}$$

$$PaidCash_t = \sum_{i=1}^a Coupon_{i,t} \cdot Amount_{i,n} \cdot Capfactor_{i,rb}$$

$$BaseValue_n = \sum_{i=1}^a (DirtyPrice_{i,n} + CPA_{i,t}) \cdot Amount_{i,n} \cdot Capfactor_{i,rb}$$

Whereas:

$Index_t$ = Value of the index on Business Day t.

$Index_n$ = Value of the index on the last Adjustment Day n.

$CPA_{i,t}$ = Variable Coupon Adjustment Factor i on Business Day t is 0 if a bond enters the index during an ex-dividend period. If the bond is already in the index during the ex-dividend period, the Variable Coupon Adjustment Factor equals the coupon amount.

$DirtyPrice_{i,t}$ = Dirty Price of the bond i on Business Day t, whereas Dirty Price t is the sum of the clean price of the bond i on Business Day t and the accrued interest on Business Day t.

$DirtyPrice_{i,n}$ = Dirty Price of the bond i on the last Adjustment Day n, whereas Dirty Price is the sum of the clean price of the bond i on the last Adjustment Day n and the accrued interest on the last Adjustment Day n.

$Amount_{i,n}$ = Amount Outstanding of the respective bond as defined on the last Adjustment Day n.

$PaidCash_t$ = a) Value of the coupon payments between Adjustment Days.
 b) If a bond i will be removed from the index between Adjustment Days, the resulting payment of the bond will be included in the Paid Cash component of the index. On the next Adjustment Day "Paid Cash" will be reinvested in the index.

$Coupon_{i,t}$ = Coupon payment of bond i between payment date and Adjustment Day n. In case there is no coupon payment, $Coupon_{i,t}$ is 0.

$Capfactor_{i,rb}$ = Weighting Cap Factor of portfolio component i determined on Selection day rb, to cap the weighting as described under Index Weighting

3.2 Accuracy

The value of the index will be rounded to two decimal places.

According to the terms of the bond, the Index Calculator will take the following conventions into account:

Act/Act
Act/360
Act/365
30/360
ISMA 30/360

The index does not take taxes into account and assumes gross coupon payments.

Accrued interests are calculated with settlement convention t+0

3.3 Adjustments

Indices need to be adjusted for systematic changes in prices once these become effective. The Committee will decide from time to time if the Solactive USD Liquid High Yield Enhanced Corporate Index needs to be adjusted.

The following corporate actions will result in changes or adjustments to an index as indicated below between Adjustment Days:

(a) Full Tender or Early Redemption: The bond proceeds will be held as “Paid Cash” and reinvested into the index on the next Adjustment Day. For the avoidance of doubt a Tender must be mandatory, the pure offer to tender a bond will not lead to an adjustment of the index.*

(b) Flat Trading: A bond is flat trading if the bond issuer will not meet its coupon payment obligation which means that the buyer of a bond is not responsible for paying the interest that has accrued since the last payment. If a bond is defined to be “flat trading” between two Adjustment Days the respective accrued interests and coupons will be set to 0. The bond will not be removed until the next Adjustment Day.

(c) Defaulted Bonds: If the status of a bond changes to “In Default”, the bond will remain as part of the index or portfolio at the last available evaluated price provided by the pricing source until the next regular index Adjustment Day.

(d) Exchange Offers:

- 1) optional exchange offers are not treated in the index;*
- 2) mandatory exchange offers: In case less than 90% of the amount outstanding is exchanged the exchange will not be considered in the index.
- 3) mandatory exchange offers: In case more than 90% of the amount outstanding is exchanged the exchange will be considered in the index calculation by exchanging the relevant bonds, so that the new bond will receive the weight of the old exchanged bond.

The capping factor of the new bond is calculated based on the following formula:

$$CapFactor_{t,new} = \frac{(Price_{t,old} + ACCInt_{t,old}) * Amount_{SD,old} * Cap_{SD,old}}{(Price_{t,new} + ACCInt_{t,new}) * Amount_{t,new}}$$

(e) Fungible Bonds:

- 1) The parent bond and the sub-tranche are both index constituents: Both bonds are kept in the index until the next Adjustment Day. On the next Adjustment Day, the new bond will be removed and the Amount Outstanding of the parent bond will be increased by the amount of the new bond issue.
- 2) The parent bond is an index constituent and the sub-tranche is not: On the next Adjustment Day, the Amount Outstanding of the parent bond will be increased by the amount of the sub-tranche.

3) The parent bond is not an index constituent but the sub-tranches: On the next Adjustment Day, the sub-tranche leaves the index and the parent bond enters the index including the Amount Outstanding added from the sub-tranche (assuming that it meets the requirements of the Selection Pool).

(f) Payment-in-Kind Bonds: These bonds pay interest in additional bonds rather than in cash. Assuming the additional bonds will be sold immediately and the proceeds will be reinvested in the index, payments-in-kind are therefore considered as cash in the Paid Cash component in all Total Return calculations.

Note: Debt issuances of an existing bond will not be considered until the next Adjustment Day.

*For the avoidance of doubt, an optional tender or exchange offer may lead to an index adjustment after the end of the submission period. In case the tender or exchange has been successful for at least 90% of the Amount outstanding, the bond will be removed from the index/exchanged into the relevant bond.

4. Definitions

4.1 index-specific definitions

The “**Selection Pool**” comprises bonds that fulfill the following conditions:

- Bonds are part of the Solactive USD High Yield Corporate Index
- Bonds that have a composite numerical rating strictly above 19 are excluded
- Bonds that lack information on sector classification, effective duration or yield to maturity are excluded

4.2 Further definitions

“**Announcement Day**” is the Business Day following the Quarterly or Monthly Selection Day.

A “**Business Day**” 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.

“**Call**” means that a bond with a callable feature will be redeemed before the actual maturity date of the bond. The callable feature allows the issuer of the bond to retain the privilege of redeeming the bond before the actual maturity date.

“**Composite Rating**”

Bond ratings from Standard & Poor’s and Moody’s are mapped to numerical ratings between 1 and 22 as below:

SP	Moody	Numerical
AAA	Aaa	1
AA+	Aa1	2
AA	Aa2	3
AA-	Aa3	4
A+	A1	5
A	A2	6
A-	A3	7
BBB+	Baa1	8
BBB	Baa2	9
BBB-	Baa3	10
BB+	Ba1	11
BB	Ba2	12
BB-	Ba3	13
B+	B1	14
B	B2	15
B-	B3	16
CCC+	Caa1	17
CCC	Caa2,caa	18
CCC-	Caa3	19
CC	Ca	20
C	C	21
D,SD	D	22

Composite numerical rating of a bond is calculated as the average numerical ratings from all available ratings, rounded to signal digit, with .5 rounded up. The composite numerical rating can then be mapped to a composite rating in string as below:

Numerical	Rating
AAA	1

AA+	2
AA	3
AA-	4
A+	5
A	6
A-	7
BBB+	8
BBB	9
BBB-	10
BB+	11
BB	12
BB-	13
B+	14
B	15
B-	16
CCC+	17
CCC	18
CCC-	19
CC	20

A **“Credit Event”** is the suspension of debt service, insolvency or failure to pay on time.

“Early Redemption” includes every event that leads to a redemption of a bond before the actual maturity date.

“Exchange Offer” means that the holder of a bond is invited to exchange the existing bond to another debt security.

In particular, an **“Extraordinary Event”** is

- an early redemption of the bond
- a credit event

A bond is **“Flat Trading”** if the bond issuer will not meet its coupon payment obligation which means that the buyer of a bond is not responsible for paying the interest that has accrued since the last payment.

A **“Fungible Bond”** is a new issue that has all the same specifications as an existing issue (bonds with the same parameters can be issued in different tranches). At a specific date, the tranches will be combined into one bond. After this date, the parent tranche will include the Amount Outstanding of all new tranches.

A bond is **“In Default”** when the issuer is not able to fulfil its bond payment obligations anymore after the 30 days’ grace period.

“High-Yield” are all issues that are rated below investment grade (BBB-/Baa3) by at least one of these two rating agencies: Standard & Poor’s and Moody’s

“Index Components” are all bonds in the index.

The **“Index Currency”** is USD.

“Last Evaluated Bid Price” the last available Evaluated Bid Price by the designated Pricing Provider.

“Monthly Adjustment Day” is the last Business Day of each month other than March, June, September and December.

“Monthly Selection Day” is a Business Day 3 Business Days prior to the Monthly Adjustment Day.

“Paid Cash” is either the value of the coupon payments between Adjustment Days or the resulting payment when a bond is removed from the index between Adjustment Days. On the next Adjustment Day **“Paid Cash”** will be reinvested in the index.

“Payment-In-Kind Bonds” are a type of bonds that pay interest in additional bonds rather than in cash.

“Quarterly Adjustment Day” is the last Business Day of March, June, September and December.

“Quarterly Selection Day” is a Business Day 3 Business Days prior to the Quarterly Adjustment Day in March, June, September and December. If the Quarterly Selection Day happens to be Christmas Eve the new composition is fixed 1 Business Day in advance.

“Tender Offer” means that a holder of a bond is invited to tender the bond for a specific price at a specific time before the actual maturity date.

A **“Total Return Index”** measures the performance of the index components by assuming that all distributions are reinvested into the index, i.e. the index does not only reflect pure price movements.

“Zero Coupon Bonds” do not pay interest but are issued at a discount.

5 Appendix

5.1 Contact data

Information regarding the Solactive USD Liquid High Yield Enhanced Corporate Index concept

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**Further information about the index can also be obtained via the following link:
<https://www.solactive.com>**

5.2 Calculation of the Index – change in calculation method

The application by the index calculator of the method described in this document is final and binding. The index calculator 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 calculator may also make changes to the terms and conditions of the index and the method applied to calculate the index, which he 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 calculator is not obliged to provide information on any such modifications or changes. The Index calculator will make announcements regarding the amendment of the index guideline. Despite the modifications and changes the index calculator will take the appropriate steps to ensure a calculation method is applied that is consistent with the method described above.