

iTraxx-CDX IG Global Credit Steepener & Flattener *Indices Guide*

February 2023

Table of Contents

iTraxx-CDX IG Global Credit Steepener & Flattener Indices	3
Index Summary Table	3
Index Calculation	4
Inputs	4
CDS Target Weights	4
Index Value	4
Returns	5
Ratios	6
CDS Notional	6
CDS Rolls	6
CDS Notional Rebalancing Schedule	6
Credit Events	7
Index Governance and Regulatory Compliance	8
Index Data	9
Credit Prices	9
Index History	9
Data Publication and Access	9
Calendar	9
Index Restatement	10
Index Review	10
Annotations	11
Appendix I – Transaction Costs	14
Transaction Costs at Inception	14
Appendix II – Credit Event Costs	15
Appendix III – Index Parameters	16
Further Information	17
Glossary of Key Terms	17
Contractual or Content Issues	17
Technical Issues and Client Support	17
Formal Complaints	17
General Index Inquiries	17

Disclaimer	18
Performance Disclosure/Back-Tested Data	18
Intellectual Property Notices/Disclaimer	19

iTraxx-CDX IG Global Credit Steepener & Flattener Indices

This document describes the methodology for the iTraxx-CDX Investment Grade (IG) Global Credit Steepener & Flattener Indices (the “Indices”). The Steepener Index is rebalanced monthly to hold 3x leveraged 10Y protection buyer positions, with leverage equally allocated to iTraxx Europe (1.5x) and CDX.NA.IG (1.5x) credit default swap (CDS) indices. The Steepener index has 5Y protection seller positions on iTraxx Europe and CDX.NA.IG that are rebalanced to maintain credit spread DV01 neutrality to their respective 10Y positions. The Flattener Index is rebalanced to hold CDS positions with opposite directions to those of the Steepener Index. The base currency of the Steepener and Flattener indices is EUR. No FX hedging is included. A cash return of minus a spread is included.

The CDS index positions held are rolled to the latest issued series over three days starting on the second business day the new series becomes available semi-annually in March and September. The methodology includes transaction costs. The indices are calculated on all business days “t”.

Index Summary Table

Index	Ticker	Underlying Contracts	Base Currency	Target Leverage	Calendars
iTraxx-CDX IG Global Credit Steepener	ITXCDXST	Protection Seller: iTraxx Europe 5Y, CDX.NA.IG 5Y	EUR	3x leverage on 10Y; 5Y leverage determined to balance credit spread DV01	London, TARGET, New York
		Protection Buyer: iTraxx Europe 10Y, CDXIG 10Y			
iTraxx-CDX IG Global Credit Flattener	ITXCDXFL	Protection Buyer: iTraxx Europe 5Y, CDX.NA.IG 5Y	EUR	3x leverage on 10Y; 5Y leverage determined to balance credit spread DV01	London, TARGET, New York
		Protection Seller: iTraxx Europe 10Y, CDXIG 10Y			

Index Calculation

The following sections describe the calculation of the index.

Inputs

The index levels are calculated each business day using the IHS Markit CDS Index prices which in turn are used to derive the Present Value (PV). IHS Markit CDS Index prices as published by the IHS Markit Pricing Service are used. The following Pricing Snaps are used to calculate the respective index levels:

Index	Pricing Snap
CDX North America	New York 17:00 hours
iTraxx Europe	London 17:00 hours

The exchange rates used for currency conversions will be done using the 16:00 London rate from WM/Refinitiv for the relevant currency.

CDS Target Weights

The CDS indices index target weights are given below:

$$(1) \quad w_{j,m,t}^{CDS} = 1.5 \cdot DV01_{j,n,t} / DV01_{j,m,t}$$

$$(2) \quad w_{j,n,t}^{CDS} = 1.5$$

$$(3) \quad w_{k,m,t}^{CDS} = 1.5 \cdot DV01_{k,n,t} / DV01_{k,m,t}$$

$$(4) \quad w_{k,n,t}^{CDS} = 1.5$$

where:

$m = 5Y$ CDS index

$n = 10Y$ CDS index

$j = iTraxx$ Europe CDS index

$k = CDX.NA.IG$ CDS index

$DV01_{n,t}$ is the value change in basis points (bps) per unit notional for a parallel upward shift in the underlying credit spread curve of one basis point (1bp).

Index Value

The index has an initial value of 100.

$$(6) \quad I_{t_0} = 100$$

The index is rebalanced monthly, but its value is calculated daily on each business day. Its value each day is calculated using the overall return (R_t).

$$(7) \quad I_t = I_{t-1} \cdot (1 + R_t)$$

The overall return is the sum of the return components for the CDS indices weighted by the CDS notional to index values and the cash return:

$$(8) \quad R_t = x_t^{cash} R_t^{cash} + \sum_{i \in G} x_{i,t}^{CDS} \cdot R_{i,t}^{CDS}$$

where:

$$G = \{iTraxx Europe 5Y, iTraxx Europe 10Y, CDX.NA.IG 5Y, CDX.NA.IG 10Y\}$$

In the rest of the document, the subscript i is used to denote the different CDS indices held: (*iTraxx Europe 5Y*, *iTraxx Europe 10Y*, *CDX.NA.IG 5Y*, *CDX.NA.IG 10Y*). During the three days that the CDS are rolled, there will be different variables (returns, notionals, etc.) for both the old and new series.

Returns

CDS Returns. The return on each of the CDS indices considers the change in PV of the index held as well as coupons, credit events, and transaction costs. The PV, coupon terms, and credit event terms in the formula below are for protection seller positions regardless of whether the underlying CDS is a protection seller or protection buyer since the φ_i^{CDS} variable is used to make the sign of the $x_{i,t}^{CDS}$ notional ratio to negative for protection buyer positions. Excluding the credit event and transaction cost terms, the units of these are in terms of percentage of the product of the notional and the index factor ($f_{i,t}$) so these can be multiplied by $f_{i,t}$, the notional to index value fraction ($x_{i,t}^{CDS}$) and the index value to give the change in index value. Over rolls, two sets of variables are used to account for the old and new series. The transaction cost term is defined in *Appendix I – Transaction Costs*.

$$(9) \quad R_{i,t}^{CDS} = FX_{i,t}^{LCY|BCY} \cdot f_{i,t} \cdot PV_{i,t}^{\%,dirty} - FX_{i,t-1}^{LCY|BCY} \cdot f_{i,t-1} \cdot PV_{i,t-1}^{\%,dirty} + FX_{i,t}^{LCY|BCY} \cdot (\Delta_{t_{Cprev},tc} \cdot f_{i,t-1} \cdot Coupon_{i,t-1}^{\%,ifCouponDate} - CEC_{i,t}^{\%} - \varphi_i^{CDS} \cdot TransactionCosts_{i,t}^{\%})$$

The coupon term has a value of zero if it is not a coupon payment date. The credit event costs ($CEC_{i,t}^{\%}$) are zero on all days except the switching date (t_{swt}) that the index calculation methodology switches from the previous index version data for the underlying CDS index i to the “reduced” index version data where the impacted entity is zero weighted as described in the *Credit Events* section; its value is defined in *Appendix II – Credit Event Costs*.

$FX_{i,t}^{LCY|BCY}$ is the foreign exchange rate that specifies how many units of BCY can be bought with one unit of LCY. BCY is the base currency of the Steeper or Flattener Index and LCY is the currency of the underlying CDS. If BCY and LCY are the same currency, then $FX_{i,t}^{LCY|BCY}$ is equal to one.

Cash Return. The cash return R_t^{cash} is the product of the interest rate for the cash component and the year fraction between $t-1$ and t using the Actual/360 convention. The cash component earns interest at the Overnight Rate minus a spread (s_1 or s_2).

$$R_t^{cash} = (r_{t-1}^{ON} - s) \cdot \Delta_{t-1,t}$$

Where, s is the applicable spread, either s_1 or s_2 for the Steeper or Flattener index, respectively.

Table A – Overnight Rate & Spread Removed from Overnight Rate

Start Date	Overnight Rate	S1	S2
20 March 2007	EONIA ¹	0.00%	0.00%
1 April 2021	EONIA	0.15%	0.15%
15 June 2021	ESTR ²	0.07%	0.07%
10 February 2023	ESTR	0.18%	0.18%

¹ Euro Overnight Index Average (EONIA)

² Euro Short Term Rate (ESTR)

Ratios

CDS Notional to Index Value Ratio. The notional must be determined as described in the next section in order to calculate the CDS notional to index value ratio, $x_{i,t}^{CDS}$.

$$(14) \quad x_{i,t}^{CDS} = \frac{\varphi_i^{CDS} \cdot \text{Notional}_{i,t-1}}{I_{t-1}}$$

Cash Notional to Index Value Ratio. The cash notional to index value ratio, $x_{i,t}^{cash}$ is set to be equal to 1.

$$(15) \quad x_{i,t}^{cash} = 1$$

CDS Notional

The portfolio is rebalanced monthly to align the notional to index value ratios with the target weights. The notional is always considered positive although $x_{i,t}^{CDS}$ can be positive or negative depending on long/short direction.

The following relation holds for each underlying CDS index when it is rebalanced monthly, excluding over rolls described in the next section:

$$(16) \quad \frac{FX_{i,t-1}^{LCY|BCY} \cdot \text{Notional}_{i,tr}}{I_{t-1}} = w_{i,t-1}^{CDS}$$

The CDS notional values for each underlying CDS index that satisfy the ratios above when rebalancing can then be determined by the formula below obtained from rearranging the preceding equations. The formula below gives the notional after rebalancing on rebalancing date tr . Note: $\text{Notional}_{i,tr}$ is in the currency of the CDS which may be different from the Index currency, hence the FX conversion.

$$(17) \quad \text{Notional}_{i,tr} = \frac{w_{i,t-1}^{CDS} \cdot I_{t-1}}{FX_{i,t-1}^{LCY|BCY}}$$

On days that are not rebalancing or roll dates, the Notional remains constant and equal to the previous day's notional.

$$(18) \quad \text{Notional}_{i,t \neq tr} = \text{Notional}_{i,t-1}$$

CDS Rolls

The CDS index positions held are rolled to the latest issued series over three days starting on the second business day the new series becomes available semi-annually in March and September. One third of the target weight allocation is shifted from the old series to the new series each day over the roll, and the notionals are rebalanced each day over the roll.

CDS Notional Rebalancing Schedule

The CDS index notionals are rebalanced monthly on the first business day of the month in the months of January, February, March, May, June, July, August, September, November, and December. CDS index notionals are also rebalanced over the three days in the roll month when the old CDS index series is rebalanced to the new CDS index series. The CDS notionals are not rebalanced on the first business day in April and October (since they will have recently been rebalanced during the roll) unless the roll is delayed and no rebalancing related to the roll has taken place by the first business day of April or October, respectively.

Credit Events

In the case of credit events, the Credit Derivatives Determinations Committee votes to determine if a credit event has occurred for an entity and if an auction will be held. If the vote is positive for an entity in either of the underlying CDS indices, IHS Markit publishes a new index version (the “reduced” index) giving the impacted entity a weight of zero. Note the new “reduced” index version will still be the same CDS index series as the previous version.

The index methodology handles restructuring and non-restructuring credit events in the underlying CDS indices differently as described below.

In the case of credit events, the index calculation methodology switches from using the previous index version data for the underlying CDS index i to the “reduced” index version data on the switching date (t_{swt}) when it becomes available. If the switch to the “reduced” index data occurs on day $t = t_{swt}$, the $f_{i,t} \cdot PV_{i,t}^{\%,dirty}$ variables use the “reduced” CDS index i version data and $f_{i,t-1} \cdot PV_{i,t-1}^{\%,dirty}$ variables use the previous index i version data.

Index Governance and Regulatory Compliance

IHS Markit Benchmark Administration Limited (IMBA UK) is the Administrator of the iTraxx-CDX Investment Grade Global Credit Steepener & Flattener Indices. Information on IMBA UK's governance and compliance approach can be found [here](#). This document covers the following topics:

- Governance arrangements, including external committees
- Input data integrity
- Conflicts of interest management
- Market disruption and Force Majeure
- Methodology changes and cessations
- Complaints
- Errors and restatements
- Reporting of infringements and misconduct
- Methodology reviews
- Business continuity

More details about IMBA UK can be found on the Administrator's website: [Benchmark Administration by IMBA UK | IHS Markit](#).

Index Data

Credit Prices

All market data used is end-of-day data at mid-price. CDS index prices as published by the S&P Global Market Intelligence CDS Pricing Service are used. The following pricing snaps are used to calculate the index levels:

Index	Pricing Snap
iTraxx Europe 5Y	London 17:00 hours
iTraxx Europe 10Y	London 17:00 hours
CDX.NA.IG 5Y	New York 17:00 hours
CDX.NA.IG 10Y	New York 17:00 hours

Index History

Index	Base Date	Base Level
iTraxx-CDX IG Global Credit Steepener	20 March 2007	100
iTraxx-CDX IG Global Credit Flattener	20 March 2007	100

Data Publication and Access

The table below summarizes the publication of the Index data.

Frequency	File Type	Access	Publication Time
Daily	Index levels	S&P Dow Jones Indices FTP Server / S&P Dow Jones Indices website / Bloomberg / Refinitiv	New York Close

In the event that S&P Global Market Intelligence Pricing Service does not publish the relevant CDS index price/spread or in periods of market stress or disruption as well as in illiquid or fragmented markets preventing the publication of a daily S&P Global Market Intelligence CDS index price, S&P Dow Jones Indices will publish on the iTraxx News page of its [website](#) a statement outlining the course of action due to the disruption.

In the event of a major structural change in the CDS market that affects the calculation of the Indices, S&P Dow Jones Indices will confer with all relevant stakeholders and publish the outcome of any material change. Also published will be any decisions made at S&P Dow Jones Indices' discretion that prompted the resulting methodology change.

Calendar

Markit publishes an index calculation calendar which is available [here](#): under Calendar for registered users.

The following business calendars are used for the respective indices:

Index	Business Calendars
iTraxx-CDX IG Global Credit Steepener	London, TARGET, New York
iTraxx-CDX IG Global Credit Flattener	London, TARGET, New York

Index Restatement

Index restatement follows the policy described in the [CDS Benchmarks Restatement Policy](#), available on S&P Dow Jones Indices' [website](#).

Index Review

Index methodology reviews for the iTraxx-CDX IG Global Credit Steepener Index and iTraxx-CDX IG Global Credit Flatteners Index outlined within this guide are performed on a periodic basis. The index rules, their enforcement will be governed by the Index Advisory Committee. The purpose of this committee is to conduct a timely review of the index methodology and any changes thereto. As part of the review process, the committee will address any suggested changes brought to it by index stakeholders, such as a potential change to any of the Index Parameters. In the event that following an index review an amendment is to be made to the Index Parameters, a notice of the proposed change will be published on the iTraxx News page. Following the publication of the impending index rule change, a consultation period is put in place up until the second Wednesday following the notice having been made public or the business day thereafter if the Wednesday is not an index business day. Provided that during the consultation period no concerns raised by index stakeholders are seen to be material by the Index Advisory Committee, the rule change will be implemented for the index close on the index business day following the final day of the consultation period.

Annotations

$b_{j,m}$	Fraction of the iTraxx Europe 5Y index spread assumed to be the estimate of the bid-offer spread
$b_{j,n}$	fraction of the iTraxx Europe 10Y index spread assumed to be the estimate of the bid-offer spread
$b_{k,m}$	fraction of the CDX IG 5Y index spread assumed to be the estimate of the bid-offer spread
$b_{k,n}$	fraction of the CDX IG 10Y index spread assumed to be the estimate of the bid-offer spread
$b_{e,(t,swt)}$	Percentage of the CDS single name spread assumed to be the estimate of the bid/offer spread
$BidOffer_{i,t}^{\%,roll}$	Bid/offer cost when buying/selling CDS indices to roll to the new series on roll dates
$BidOffer_{i,tr}^{\%,rebal}$	Bid/offer rebalancing transaction cost
$ClearingCosts_{i,tr}^{\%}$	Clearing cost representing other transaction costs for trading cleared CDS indices that are not bid-offer related
$Coupon_{i,t-1}^{\%ifCouponDate}$	Coupon as a percent of the product of the notional and the index factor (has a value of 0 if not a coupon payment date)
$CEC_{i,t}^{\%}$	Credit event cost as a percent of the notional
$d_{j,m}$	Roll trade discount parameter for the iTraxx Europe 5y reflecting reduced transaction costs for trades rolling CDS indices around roll dates
$d_{j,n}$	Roll trade discount parameter for iTraxx Europe 10y reflecting reduced transaction costs for trades rolling CDS indices around roll dates
$d_{k,m}$	Roll trade discount parameter for iTraxx Europe 5y reflecting reduced transaction costs for trades rolling CDS indices around roll dates
$d_{k,n}$	Roll trade discount parameter for the iTraxx Europe 10y reflecting reduced transaction costs for trades rolling CDS indices around roll dates
$DV01_{i,t}$	Value change in the underlying CDS index in basis points per unit of notional for a 1bp parallel upward shift in the underlying credit spread curve

E_i	Original total number of entities present in the CDS index series i on the day it was created
$f_{i,t}$	Index factor representing the fraction of entities remaining in the CDS index out of the total number of entities at the CDS index series inception
g	Clearing cost parameter
I_t	Index value at day t
i	Denotes the underlying CDS Index
L	Target CDS notional market exposure ratio
$\eta_{i,tr}$	Approximation of absolute value of the amount of notional to be bought or sold at rebalancing
$Notional_{i,tr}$	CDS notional
$PV_{i,t}^{\%,clean}$	CDS index clean PV as a percent of the product of the notional and the index factor
$PV_{i,t}^{\%,dirty}$	CDS index dirty PV as a percent of the product of the notional and the index factor
$PV_{e,t_{swt}}^{\%,dirty,single}$	Single name CDS dirty PV for the entity e impacted by the credit event as a percent of the notional
r_{t-1}^{ON}	Overnight Rate (as per Table A) on
R_t	Overall index return at time t
R_t^{cash}	Cash return
$RebalTransactionCosts_{i,t}^{\%}$	Transaction cost of rebalancing
$RecoveryRate_{e,(t_{swt}-1)}$	Recovery rate for the entity e
s	Spread subtracted from the benchmark interest rate for overall interest on cash component
$S_{i,t_{roll},series}$	CDS index spread of the old or new series on the roll date. It should be entered as a decimal number (e.g., a 250bp spread should be entered as 0.0250).
$S_{e,(t_{swt})}$	Single name CDS spread for the entity e impacted by the credit event. It should be entered as a decimal number (e.g., a 250bp spread should be entered as 0.0250).
t_0	Inception date (also considered a rebalancing date)
t	Business day t

$t - 1$	Previous business day
tr	Refers to rebalancing date
$TransactionCosts_{i,t}^{\%}$	Transaction cost as a percent of the notional
$w_{j,m}^{CDS}$	iTraxx Europe 5Y target weight
$w_{k,m}^{CDS}$	iTraxx Europe 10Y target weight
$w_{j,n}^{CDS}$	CDX.NA.IG 5Y target weight
$w_{k,n}^{CDS}$	CDX.NA.IG 10Y target weight
x_t^{cash}	Ratio of cash to index value at time t
$x_{i,t}^{CDS}$	Ratio of CDS notional to index value
$\Delta_{t_{prev}t_c}$	Year fraction between the previous and the current coupon payment date using the Actual/360 convention
$\Delta_{t_{prev}t_{EDD}}$	Year fraction from the previous coupon date to the Event Determination Date using the Actual/360 convention
φ_i^{CDS}	A long/short variable that is equal to 1 if CDS index i are protection seller positions or -1 if they are protection buyer positions

Appendix I – Transaction Costs

The transaction cost is zero if not a rebalancing tr or roll date t_{roll} . It is the sum of the transaction cost components when rebalancing the CDS index notional and the bid-offer cost component when buying/selling CDS indices to roll to the new series on roll dates. In general, the bid offer costs are calculated by assuming the bid-offer spread can be estimated as a percentage of the CDS index spread.

$$(19) \quad TransactionCosts_{i,t}^{\%} = RebalTransactionCosts_{i,t}^{\%,rebal} + BidOffer_{i,t}^{\%,roll}$$

The $BidOffer_{i,t}^{\%,roll}$ is zero if not a roll date. On roll dates, it is calculated as follows:

$$(20) \quad BidOffer_{i,t_{roll}}^{\%,roll} = \frac{1}{3} \cdot \frac{1}{2} \cdot b_i \cdot d_i \cdot (f_{i,t,oldseries} \cdot S_{i,t_{roll},oldseries} \cdot DV01_{i,t_{roll},oldseries} + f_{i,t,newseries} \cdot S_{i,t_{roll},newseries} \cdot CS01_{i,t_{roll},newseries})$$

$RebalTransactionCosts_{i,t}^{\%}$ are zero if it is not a rebalancing date. $RebalTransactionCosts_{i,t}^{\%}$ are also zero on the rebalancing date coinciding with the series rolls. On other monthly rebalancing dates, it's calculated as:

$$(21) \quad RebalTransactionCosts_{i,tr}^{\%} = BidOffer_{i,tr}^{\%,rebal}$$

The bid-offer rebalancing transaction cost is calculated using an approximation $\eta_{i,tr}$ for the absolute value of the amount of notional to be bought or sold in the rebalancing to avoid circular dependencies in the formulas:

$$(23) \quad BidOffer_{i,tr}^{\%,rebal} = f_{i,tr} \cdot \frac{\eta_{i,tr}}{Notional_{i,tr-1}} \cdot \frac{1}{2} \cdot b_i \cdot S_{i,tr} \cdot DV01_{i,tr}$$

$$(24) \quad \eta_{i,tr} = \left| \frac{w_{i,t-1}^{CDS}}{FX_{i,t-1}^{LCY|BCY}} \cdot I_{t-1} - Notional_{i,tr-1} \right|$$

Transaction Costs at Inception

The index value at t_0 (I_{t_0}) is 100. No transaction costs are applied for the CDS indices that are included at inception.

Appendix II – Credit Event Costs

The credit event costs as a percentage of the notional are calculated as described below. It reflects the net protection payment cost in the case of a credit event. The credit event costs are zero on all days except the switching date (t_{swt}), on which the index calculation methodology switches from using the previous index version data for the underlying CDS index i to the new “reduced” index version data where the impacted entity is zero weighted, when it becomes available. The calculation of credit event costs is different for restructuring and non-restructuring credit events in the underlying CDS indices.

The formula below gives the credit event costs for the non-restructuring case:

$$(26) \quad CEC_{i,t_{swt}}^{\%,non-res} = \frac{1}{E_i} \cdot \left((1 - Recovery\ Rate_{e,(t_{swt}-1)}) - (\Delta_{t_{c_{prev},t_{EDD}}} \cdot Coupon_{i,t_{EDD}}^{\%}) \right)$$

The formula below gives the credit event costs for the restructuring case (if it is applicable for the underlying CDS). A cost for a restructuring case is only included if applicable for the underlying CDS. It is applicable for iTraxx indices, but not CDX indices.

$$(27) \quad CEC_{i,t_{swt}}^{\%,res} = \frac{-1}{E_i} \cdot \left(PV_{e,t_{swt}}^{\%,dirty,single} - \frac{1}{2} \cdot b_{e,(t_{swt})} \cdot S_{e,(t_{swt})} \cdot DV01_{e,(t_{swt})} \right)$$

In the unlikely event of multiple entities being removed from the underlying CDS index series on the same day, the credit event costs of each of these would be added. However, if an entity had been removed previously at an earlier date and its credit event cost already included previously, it is not included again.

Appendix III – Index Parameters

Symbol	Value	Description
$b_{e,(t_{swt})}$	.10	fraction of the CDS single name spread assumed to be the estimate of the bid/offer spread
$b_{j,m}$	.007	fraction of the iTraxx Europe 5Y index spread assumed to be the estimate of the bid-offer spread
$b_{j,n}$	.008	fraction of the iTraxx Europe 10Y index spread assumed to be the estimate of the bid-offer spread
$b_{k,m}$	.007	fraction of the CDX IG 5Y index spread assumed to be the estimate of the bid-offer spread
$b_{k,n}$	.008	fraction of the CDX IG 10Y index spread assumed to be the estimate of the bid-offer spread
$d_{j,m}$	.25	roll trade discount parameter for the iTraxx Europe 5y reflecting reduced transaction costs for trades rolling CDS indices around roll dates
$d_{j,n}$	.33	roll trade discount parameter for the iTraxx Europe 10y reflecting reduced transaction costs for trades rolling CDS indices around roll dates
$d_{k,m}$	.25	roll trade discount parameter for the iTraxx Europe 5y reflecting reduced transaction costs for trades rolling CDS indices around roll dates
$d_{k,n}$	.33	roll trade discount parameter for the iTraxx Europe 10y reflecting reduced transaction costs for trades rolling CDS indices around roll dates

Further Information

Glossary of Key Terms

Further information regarding use of IHS Markit Credit Indices and the glossary of key terms is available in the [IHS Markit Credit Index Primer](#) located on the IHS Markit [website](#).

Contractual or Content Issues

For contract- or content-related queries, please refer to the following:

Markit Indices Limited
Friedrich-Ebert-Anlage 35-37
60327 Frankfurt am Main
Germany

Tel +49 (0) 69 299 868 100 Fax +49 (0) 69 299 868 149
E-mail: indices@ihsmarkit.com
Internet: <https://ihsmarkit.com/index>

Technical Issues and Client Support

For client and technical support, please e-mail indices@ihsmarkit.com, or call the relevant telephone number below:

Asia Pacific

Japan: +81 3 6402 0127

Singapore: +65 6922 4210

Europe

General: +800 6275 4800

UK: +44 20 7260 2111

USA

General: +1 877 762 7548

Formal Complaints

Formal complaints should be e-mailed to spdji_compliance@spglobal.com.

Please note: spdji_compliance@spglobal.com should only be used to log formal complaints.

General Index Inquiries

For general index inquiries, please contact indices@ihsmarkit.com.

Disclaimer

Performance Disclosure/Back-Tested Data

Where applicable, S&P Dow Jones Indices and its index-related affiliates (“S&P DJI”) defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index’s Launch Date are considered back-tested. S&P DJI defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company’s public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed “Date of introduction”) is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index’s public release date.

Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Information presented prior to an index’s launch date is hypothetical back-tested performance, not actual performance, and is based on the index methodology in effect on the launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate certain ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using “Backward Data Assumption” (or pulling back) of ESG data for the calculation of back-tested historical performance. “Backward Data Assumption” is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as “product involvement”) were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on “Backward Data Assumption” please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used. Index returns shown

do not represent the results of actual trading of investable assets/securities. S&P DJI maintains the index and calculates the index levels and performance shown or discussed but does not manage any assets.

Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).

Intellectual Property Notices/Disclaimer

© 2023 S&P Dow Jones Indices. All rights reserved. S&P, S&P 500, SPX, SPY, The 500, US500, US 30, S&P 100, S&P COMPOSITE 1500, S&P 400, S&P MIDCAP 400, S&P 600, S&P SMALLCAP 600, S&P GIVI, GLOBAL TITANS, DIVIDEND ARISTOCRATS, Select Sector, S&P MAESTRO, S&P PRISM, S&P STRIDE, GICS, SPIVA, SPDR, INDEXOLOGY, iTraxx, iBoxx, ABX, ADBI, CDX, CMBX, MBX, MCDX, PRIMEX, HHPI, and SOVX are registered trademarks of S&P Global, Inc. ("S&P Global") or its affiliates. DOW JONES, DJIA, THE DOW and DOW JONES INDUSTRIAL AVERAGE are trademarks of Dow Jones Trademark Holdings LLC ("Dow Jones"). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. This document does not constitute an offer of services in jurisdictions where S&P DJI does not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P DJI is impersonal and not tailored to the needs of any person, entity, or group of persons. S&P DJI receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P DJI does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P DJI makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P DJI is not an investment advisor, commodity trading advisor, fiduciary, "promoter" (as defined in the Investment Company Act of 1940, as amended) or "expert" as enumerated within 15 U.S.C. § 77k(a), and S&P DJI makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. S&P DJI is not a tax advisor. Inclusion of a security, commodity, crypto currency, or other asset within an index is not a recommendation by S&P DJI to buy, sell, or hold such security, commodity, crypto currency, or other asset, nor is it considered to be investment or trading advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof ("Content") may be modified, reverse engineered, reproduced, or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P DJI. The Content shall not be used for any unlawful or unauthorized purposes. S&P DJI and its third-party data providers and licensors (collectively "S&P Dow Jones Indices Parties") do not guarantee the accuracy, completeness, timeliness, or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN "AS IS" "WHERE IS" BASIS. S&P DOW JONES INDICES PARTIES DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM

BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special, or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

Credit-related information and other analyses, including ratings, research and valuations are generally provided by licensors and/or affiliates of S&P Dow Jones Indices, including but not limited to S&P Global's other divisions such as S&P Global Market Intelligence. Any credit-related information and other related analyses and statements in the Content are statements of opinion as of the date they are expressed and not statements of fact. Any opinion, analyses and rating acknowledgement decisions are not recommendations to purchase, hold, or sell any securities or to make any investment decisions, and do not address the suitability of any security. S&P Dow Jones Indices does not assume any obligation to update the Content following publication in any form or format. The Content should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. S&P DJI does not act as a fiduciary or an investment advisor. While S&P DJI has obtained information from sources it believes to be reliable, S&P DJI does not perform an audit or undertake independent verification of any information it receives. S&P DJI reserves the right to vary or discontinue any index at any time for regulatory or other reasons. Various factors, including external factors beyond S&P DJI's control might necessitate material changes to indices.

To the extent that regulatory authorities allow a rating agency to acknowledge in one jurisdiction a rating issued in another jurisdiction for certain regulatory purposes, S&P Global Ratings reserves the right to assign, withdraw or suspend such acknowledgement at any time and in its sole discretion. S&P Dow Jones Indices, including S&P Global Ratings, disclaim any duty whatsoever arising out of the assignment, withdrawal, or suspension of an acknowledgement as well as any liability for any damage alleged to have been suffered on account thereof. Affiliates of S&P Dow Jones Indices LLC, including S&P Global Ratings, may receive compensation for its ratings and certain credit-related analyses, normally from issuers or underwriters of securities or from obligors. Such affiliates of S&P Dow Jones Indices LLC, including S&P Global Ratings, reserve the right to disseminate its opinions and analyses. Public ratings and analyses from S&P Global Ratings are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription), and may be distributed through other means, including via S&P Global Ratings publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.

S&P Global keeps certain activities of its various divisions and business units separate from each other to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process.

In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions, and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate, or otherwise address.

Some indices use the Global Industry Classification Standard (GICS[®]), which was developed by, and is the exclusive property and a trademark of, S&P Global and MSCI. Neither MSCI, S&P DJI nor any other party involved in making or compiling any GICS classifications makes any express or implied warranties or representations with respect to such standard or classification (or the results to be obtained by the use thereof), and all such parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability, or fitness for a particular purpose with respect to any of such standard or

classification. Without limiting any of the foregoing, in no event shall MSCI, S&P DJI, any of their affiliates or any third party involved in making or compiling any GICS classifications have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

S&P Dow Jones Indices products are governed by the terms and conditions of the agreements under which they may be provided. A license is required from S&P Dow Jones Indices to display, create derivative works of and/or distribute any product or service that uses, is based upon and/or refers to any S&P Dow Jones Indices and/or index data.