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STOXX[®] REFERENCE RATES



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1. INTRODUCTION TO THE STOXX INDEX GUIDES

The STOXX index guides are separated into the following sub-sets:

- » The **STOXX Calculation guide** provides a general overview of the calculation of the STOXX indices, the dissemination, the index formulas and adjustments due to corporate actions
- » The **STOXX Index Methodology guide** contains the index specific rules regarding the construction and derivation of the portfolio based indices, the individual component selection process and weighting schemes
- » The **STOXX Strategy guide** contains the formulas and description of all non-equity/strategy indices
- » The **STOXX Dividend Points Calculation guide** describes the dividend points products
- » The **STOXX Distribution Points Calculation guide** describes the distribution points products
- » The **STOXX ESG guide** contains the index specific rules regarding the construction and derivation of the ESG indices, the individual component selection process and weighting schemes
- » The **iSTOXX guide** contains the index specific rules regarding the construction and derivation of the iSTOXX indices, the individual component selection process and weighting schemes
- » The **STOXX Reference Rates guide** contains the rules and methodologies of the reference rate indices
- » The **STOXX Statistical Calculations** guide provides a detailed view of definitions and formulas of the statistical calculations as utilized in the reports, factsheets, indices and presentations produced by STOXX

All rule books are available for download on <http://www.stoxx.com/indices/rulebooks.html>

2. CHANGES TO THE STOXX REFERENCE RATE GUIDE

2.1. HISTORY OF CHANGES TO THE STOXX REFERENCE RATE GUIDE

- » Apr. 16, 2013: Launch of STOXX GC Pooling short-term indices (OverNight, TomNext, SpotNext)
- » Oct. 16, 2013: Extension of the STOXX GC Pooling index family for longer-terms (Spot 1 week, ..., 12 months) and introduction of additional index versions
- » Feb. 10, 2014: Introduction of minimum volume for the eligible quotes used for calculating the longer-term indices
- » Jul. 30, 2014: Addition of chapter 3 GENERAL PRINCIPLES
- » Dec. 17, 2014: Clarification of chapter 4.1.2 Longer-term indices
- » Jan. 8, 2015: Clarification of chapter 4.1.2 Longer-term indices – binding quotes

3. GENERAL PRINCIPLES

3.1. INDEX RATIONALE

STOXX defines the index rationale as the basis for applying a certain methodology in order to achieve the index objective. STOXX performs intensive research and may conduct conversations with market participants and third parties for this purpose. STOXX discloses the index objective in every case.

3.2. METHODOLOGY REVIEW POLICIES

STOXX constantly monitors the execution of the index calculation rules in order to ensure the validity of the index methodology. STOXX also conducts general methodology reviews in a periodic and ad-hoc basis, to reflect economic and political changes and developments in the investment industry. As result of these activities, STOXX introduces changes to the methodology books. Material changes are notified to subscribers and the media through the usual communication channels. Clarifications of the methodology are updated in the rulebook. All changes are tracked in the section 2.1 History of changes to the STOXX Reference Rate Guide

3.3. INDEX TERMINATION POLICY

For the termination of an index or index family for which outstanding products are present in the market to the knowledge of STOXX, a market consultation with the involved clients will be initiated by STOXX to take into account their views and concerns related to the termination or transition. A consultation period will be opened. Its duration depends on the specific issue. After the consultation period and in case of further action needed, a notification will be issued and the process defined above will be followed. In the case of a transition, STOXX will launch the alternative index and will notify of its character as a suitable replacement for an existing index whose calculation should be discontinued in the future. This notification advises clients on the alternative recommended by STOXX as replacement. The timeframe in which both indices will be calculated in parallel will be disclosed in the notification's text and will be no shorter than three months.

For the termination of an index or index family for which, to the knowledge of STOXX, no listed financial products are issued in the market, a press release notification or e-mail notification to subscribers will be communicated at least three months before coming into force. Clients or third parties with interest in the index or index family are urged to communicate as soon as possible their concerns to STOXX. Based on the feedback collected, STOXX may alter the index termination decision. For the termination of an index without financial product issued on there will be no market consultation. Changes to the original notification will be communicated in the same manner.

4. STOXX GC POOLING INDICES

4.1. OVERVIEW

STOXX GC Pooling index family reflects the secured Euro lending transactions based on the Eurex Repo® GC Pooling® market.

GC Pooling® market offers cash driven funding as an easy and reliable exchange between cash and securities. It provides his participants access to secured liquidity in an efficient and risk-optimized environment, processed through a central counterparty with real-time collateral management system. Currently in the Euro GC Pooling® market two relevant standardized baskets with eligible fixed-income securities are available - GC Pooling® ECB and ECB EXTended Basket.

The STOXX GC Pooling index family covers the full money market curve, up to twelve months. Each index is available in three versions – volume-weighted average rate indices, current rate indices and total volume indices.

4.1.1. SHORT-TERM INDICES

The index family includes twenty two short-term indices, exclusively based on trades.

Single short-term indices are calculated for each available standardized basket with eligible fixed-income securities – ECB* Basket and ECB* Extended basket – and standard terms – Overnight (ON), Tom Next (TN), Spot Next (SN).

Within the index family STOXX introduces the funding rates as a combination of all EUR ON, TN and SN transactions in the GC Pooling ECB basket and ECB Extended basket based either on the same trade day or same settlement day.

In addition to the volume-weighted average rate and total volume index versions, a current rate index version is available. It indicates the trading progress during the day and reflect the current market level, by showing intraday the latest trade for the respective short-term, without taking into account volumes.

4.1.2. LONGER-TERM INDICES

The index family includes twenty one longer-term indices, where effective daily market data from the GC Pooling Market is used. To ensure the continuous update of the indices in the absence of trades, quotes will be used for index calculation purposes. These quotes are binding, non-indicative quotes and provide high quality information about the current price level. The indices are based on the GC Pooling ECB basket and are calculated for the following standard terms: Spot - one week, - two weeks, - one month, - three months, - six months, - nine months and - twelve months.

In addition to the volume-weighted average rate and total volume index versions, a current rate index version is available. It indicates the trading progress during the day and reflect the current market level, by showing intraday the latest trade or binding quote for the respective short-term, without taking into account volumes.

4. STOXX GC POOLING INDICES

4.1.3. DEPOSIT INDICES

The two deposit indices measure the total return of a hypothetical rolling deposit with an interest rate corresponding to the STOXX GC Pooling EUR Funding Rate.

4.2. BASIC DATA

Term	GC Basket	Include Quotes	Index	ISIN	Symbol/ Bloomberg Ticker	Reuters RIC
OverNight	ECB	NO	STOXX GC Pooling EUR ON Index	DE000A0Z3MN7	SGCPON	.STXGCPION
OverNight	ECB	NO	STOXX GC Pooling EUR ON Index Volume	DE000A0Z3MP2	SGCPONV	.STXGCPIONV
OverNight	ECB	NO	STOXX GC Pooling EUR ON Current Index	DE000A1X2160	SGCPONC	.STXGCPIONC
OverNight	ECB Ext	NO	STOXX GC Pooling EUR Extended ON Index	DE000A0Z3MQ0	SGCPXON	.STXGCPXON
OverNight	ECB Ext	NO	STOXX GC Pooling EUR Extended ON Index Volume	DE000A0Z3MR8	SGCPXONV	.STXGCPXONV
OverNight	ECB Ext	NO	STOXX GC Pooling EUR Extended ON Current Index	DE000A1X2178	SGCPXONC	.STXGCPXONC
TomNext	ECB	NO	STOXX GC Pooling EUR TN Index	DE000A0Z3MS6	SGCPTN	.STXGCPITN
TomNext	ECB	NO	STOXX GC Pooling EUR TN Index Volume	DE000A0Z3MT4	SGCPTNV	.STXGCPITNV
TomNext	ECB	NO	STOXX GC Pooling EUR TN Current Index	DE000A1X2186	SGCPTNC	.STXGCPITNC
TomNext	ECB Ext	NO	STOXX GC Pooling EUR Extended TN Index	DE000A0Z3MU2	SGCPXTN	.STXGCPIXTN
TomNext	ECB Ext	NO	STOXX GC Pooling EUR Extended TN Index Volume	DE000A0Z3MV0	SGCPXTNV	.STXGCPIXTNV
TomNext	ECB Ext	NO	STOXX GC Pooling EUR Extended TN Current Index	DE000A1X2194	SGCPXTNC	.STXGCPIXTNC
SpotNext	ECB	NO	STOXX GC Pooling EUR SN Index	DE000A0Z3MW8	SGCPSN	.STXGCPISN
SpotNext	ECB	NO	STOXX GC Pooling EUR SN Index Volume	DE000A0Z3MX6	SGCPSNV	.STXGCPISNV
SpotNext	ECB	NO	STOXX GC Pooling EUR SN Current Index	DE000A1X21A6	SGCPSNC	.STXGCPISNC
SpotNext	ECB Ext	NO	STOXX GC Pooling EUR Extended SN Index	DE000A0Z3MY4	SGCPXSN	.STXGCPISXN
SpotNext	ECB Ext	NO	STOXX GC Pooling EUR Extended SN Index Volume	DE000A0Z3MZ1	SGCPXSNV	.STXGCPISXNV
SpotNext	ECB Ext	NO	STOXX GC Pooling EUR Extended SN Current Index	DE000A1X21B4	SGCPXSNC	.STXGCPISXNC
ON/TN/SN	ECB/ECB Ext	NO	STOXX GC Pooling EUR Funding Rate	DE000A0Z3M09	SGCPFR	.STXGCPFR
ON/TN/SN	ECB/ECB Ext	NO	STOXX GC Pooling EUR Funding Rate Volume	DE000A0Z3M17	SGCPFRV	.STXGCPFRV
ON/TN/SN	ECB/ECB	NO	STOXX GC Pooling EUR Deferred Funding Rate	DE000A1X21E8	SGCPDFR	.STXGCPDFR

4. STOXX GC POOLING INDICES

	Ext					
ON/TN/SN	ECB/ECB Ext	NO	STOXX GC Pooling EUR Deferred Funding Rate Volume	DE000A1X21F5	SGCPDFRV	.STXGCPDFRV
ON/TN/SN	ECB/ECB Ext	NO	STOXX GC Pooling EUR Deposit Index	DE000A1X21C2	SGCPDI	.STXGCPD
ON/TN/SN	ECB/ECB Ext	NO	STOXX GC Pooling EUR Investable Deposit Index	DE000A1X21D0	SGCPIDI	.STXGCPID

4. STOXX GC POOLING INDICES

Term	GC Basket	Include Quotes	Index	ISIN	Symbol/ Bloomberg Ticker	Reuters RIC
1 week	ECB	YES	STOXX GC Pooling EUR 1 Week Index	DE000A1X21G3	SGCP1W	.STXGCP1W
1 week	ECB	YES	STOXX GC Pooling EUR 1 Week Index Volume	DE000A1X21H1	SGCP1WV	.STXGCP1WV
1 week	ECB	YES	STOXX GC Pooling EUR 1 Week Current Index	DE000A1X21J7	SGCP1WC	.STXGCP1WC
2 weeks	ECB	YES	STOXX GC Pooling EUR 2 Weeks Index	DE000A1X21K5	SGCP2W	.STXGCP2W
2 weeks	ECB	YES	STOXX GC Pooling EUR 2 Weeks Index Volume	DE000A1X21L3	SGCP2WV	.STXGCP2WV
2 weeks	ECB	YES	STOXX GC Pooling EUR 2 Weeks Current Index	DE000A1X21M1	SGCP2WC	.STXGCP2WC
1 month	ECB	YES	STOXX GC Pooling EUR 1 Month Index	DE000A1X21N9	SGCP1M	.STXGCP1M
1 month	ECB	YES	STOXX GC Pooling EUR 1 Month Index Volume	DE000A1X21P4	SGCP1MV	.STXGCP1MV
1 month	ECB	YES	STOXX GC Pooling EUR 1 Month Current Index	DE000A1X21Q2	SGCP1MC	.STXGCP1MC
3 months	ECB	YES	STOXX GC Pooling EUR 3 Months Index	DE000A1X21R0	SGCP3M	.STXGCP3M
3 months	ECB	YES	STOXX GC Pooling EUR 3 Months Index Volume	DE000A1X21S8	SGCP3MV	.STXGCP3MV
3 months	ECB	YES	STOXX GC Pooling EUR 3 Months Current Index	DE000A1X21T6	SGCP3MC	.STXGCP3MC
6 months	ECB	YES	STOXX GC Pooling EUR 6 Months Index	DE000A1X21U4	SGCP6M	.STXGCP6M
6 months	ECB	YES	STOXX GC Pooling EUR 6 Months Index Volume	DE000A1X21V2	SGCP6MV	.STXGCP6MV
6 months	ECB	YES	STOXX GC Pooling EUR 6 Months Current Index	DE000A1X21W0	SGCP6MC	.STXGCP6MC
9 months	ECB	YES	STOXX GC Pooling EUR 9 Months Index	DE000A1X21X8	SGCP9M	.STXGCP9M
9 months	ECB	YES	STOXX GC Pooling EUR 9 Months Index Volume	DE000A1X21Y6	SGCP9MV	.STXGCP9MV
9 months	ECB	YES	STOXX GC Pooling EUR 9 Months Current Index	DE000A1X21Z3	SGCP9MC	.STXGCP9MC
12 months	ECB	YES	STOXX GC Pooling EUR 12 Months Index	DE000A1X2202	SGCP12M	.STXGCP12M
12 months	ECB	YES	STOXX GC Pooling EUR 12 Months Index Volume	DE000A1X2210	SGCP12MV	.STXGCP12MV
12 months	ECB	YES	STOXX GC Pooling EUR 12 Months Current Index	DE000A1X2228	SGCP12MC	.STXGCP12MC

4. STOXX GC POOLING INDICES

4.3. CALCULATION

4.3.1. INDEX FORMULAS

4.3.1.1. SHORT-TERM INDICES

The calculation of volume-weighted average rate, the total volume and current rate index for OverNight, TomNext and SpotNext terms considers only trades. The volume of a trade is unlimited. The index total volume is rounded to the nearest million, the volume-weighted average rate index to 3 decimal places, the current rate index to 6 decimal places. Below the relevant formulas:

	Method	Legend
Average Rate Index (I_{t0})	$I_{t0} = \frac{\sum_{j=1}^n (t_j * v_j^t)}{\sum_{j=1}^n v_j^t}$	t_j = Trade price j v_j^t = Volume of trade price j
Total Volume Index (V_{t0})	$V_{t0} = \sum_{j=1}^n v_j^t$	
Current Rate Index (CI_n)	$CI_n = t_n$	If T_n exist in the interval prior to publication, the later one will be used

4.3.1.2. LONGER-TERM INDICES

The calculation of volume-weighted average rate, the total volume and current rate index for Spot 1 week, 2 weeks, 1 month, 3 months, 6 months, 9 months and 12 months terms considers trades and binding quotes. Strict filtering and limits criteria are applied in order to ensure protection against manipulation and trades to be the driving factor. The index total volume is rounded to the nearest million, the volume-weighted average rate index to 3 decimal places, the current rate index to 6 decimal places. Below the relevant formulas:

	Method	Legend
Average Rate Index (I_{t0})	$I_{t0} = I_n = \frac{I_{n-1} * \sum_{j=1}^{n-1} V_j + T_n * V_n}{\sum_{j=1}^n V_j}$	T_j = Trade price j or average quote j V_j = Volume of Trade j or average quote j $\sum_{j=1}^{n-1} V_j$ = past volume for average quotes and trades used for calculation
	$T_n = t$ and $V_n = v^t$ or $T_n = AQ$ and $V_n = V_{AQ}$	t = Eligible trade price v^t = Volume of the eligible trade price AQ = Average quote V_{AQ} = Average quote volume
	$T_{n-1} + S^t \geq t \geq T_{n-1} - S^t$	S^t = 50bp = Spread applied for determining the eligible trades/volumes

4. STOXX GC POOLING INDICES

	Method	Legend
	$AQ = \frac{\sum_{j=1}^n q_j * v_j^q}{\sum_{j=1}^n v_j^q}$ $V_{AQ} = \frac{\sum_{j=1}^n v_j^q}{n}$	q_j = Eligible quote price j v_j^q = Volume of eligible quote price j , where Min. volume of quote price = EUR 25 m. Cap volume of quote price = EUR 250 m. Cap volume for equal quotes = EUR 250 m. Max. 10 best buy and 10 sell quotes Max. 1 quote per customer per side
	$M + S^q \geq q_j \geq M - S^q$ $M = \frac{b \cdot v_b + s \cdot v_s}{v_b + v_s}$	M = Mid price S^q = Spread applied for determining the eligible quotes (price and volume): S^q = 6bp (1w, 2w, 1m terms) S^q = 10bp (3m, 6m, 9m, 12m terms) b = best buy quote s = best sell quote v_b = best buy quote volume v_s = best sell quote volume
	If (s=NA and b=NA and n=2), → $AQ = M$ and $V_{AQ} = \frac{v_b + v_s}{2}$	
	If (s=NA and/or b=NA), Else if (b - s >= 20bp or b < s) → No calculation	
Total Volume Index (V_{t0})	$V_{t0} = \sum_{j=1}^n V_j$	V_{t0} = Index Volume, calculated based on the trade and quote volumes, used for calculating the Average Rate Index V_j = Volume of Trade j or average quote j
Current Rate Index (CI_n)	$CI_n = T_n \text{ or } CI_n = M = \frac{b + s}{2}$	M = Mid price b = best buy quote s = best sell quote If T_n/M exist in the interval prior to publication, the later one will be used
	If (s=NA and/or b=NA), Else if ($T_n=NA$), Else if (b - s >= 20bp or b < s) → $CI_n = CI_{n-1}$	

4. STOXX GC POOLING INDICES

4.3.1.1. DEPOSIT INDICES

The calculation of the deposit indices is based on the STOXX GC Pooling EUR Funding Rate used as interest rate. Below the relevant formulas:

	Method	Legend
Deposit Index (DI_{t0})	$DI_{t0} = DI_{t0-1} \left[1 + \left(\frac{d(t0-1, t0)}{360} \right) * I_{t0-1} \right]$	DI_{t0} = deposit index level today DI_{t0-1} = deposit index level previous business day I_{t0-1} = STOXX GC Pooling Funding Rate published at 18:00 on previous business day $d(t0-1, t0)$ = number of actual calendar days between current and previous business day Day Count Convention = ACT/360
Investable Deposit Index (DI_{t0}^{INV})	$DI_{t0}^{INV} = DI_{t0-1}^{INV} \left[1 + \left(\frac{d(t0+2, t0+3)}{360} \right) * I_{t0-1} \right]$	DI_{t0}^{INV} = investable deposit index level today DI_{t0-1}^{INV} = investable deposit index level previous business day I_{t0-1} = STOXX GC Pooling Funding Rate published at 18:00 on previous business day $d(t0+2, t0+3)$ = number of actual calendar days between today plus three business days and today plus two business days Day Count Convention = ACT/360

4.3.2. CURRENCY

The volume-weighted average rate indices are in percentage reflecting transaction denominated in EUR, volume indices are calculated in EUR.

4.3.3. TRADING DAYS AND HOURS

4.3.3.1. SHORT- AND LONGER-TERM INDICES

- » Calculation Frequency: Real-time
- » Dissemination period: 13:00 CET

4. STOXX GC POOLING INDICES

- » Calendar: 18:00 CET
- » Distribution: TARGET
- » Distribution: via CEF

4.3.3.2. CURRENT INDICES

- » Calculation Frequency: Real-time
- » Dissemination period: Every 15 minutes
- » Calendar: TARGET
- » Distribution: via CEF

4.3.3.3. DEPOSIT INDICES

- » Calculation Frequency: End-of-day
- » Dissemination period: 09:00 CET
- » Calendar: TARGET
- » Distribution: via CEF

4.3.4. HISTORICAL DATA

4.3.4.1. SHORT-TERM INDICES

Historical data is available since January, 4th 2010.

4.3.4.2. LONGER-TERM AND CURRENT INDICES

Historical data is not available.

4.3.4.3. DEPOSIT INDICES

Historical data is available since January, 6th 2010.