



STOXX GC Pooling EUR Deferred Funding Rate as Euro RFR Benchmark

ECB Working Group presentation

17 May 2018



Executive Summary

- GC Pooling, launched in 2005, is an efficient, reliable and representative Pan-European cash driven, electronic and centrally cleared wholesale repo market with 130+ participants
- Commercial banks, state treasuries, supranationals, insurances, pension funds, investment funds & corporates are able to place and raise Euros against approx. 14,000 ISINs of ECB eligible HQLA allocated into two standardized baskets
- Historically, GC Pooling volumes increased during periods of market stress and they are highly negatively correlated to the ECB`s provision of excess liquidity
- In 2013, STOXX Ltd, the leading global index provider, started publishing the STOXX GC Pooling EUR Deferred Funding rate which is solely based on anonymously traded short-term GC Pooling electronic order book transactions
- The STOXX GC Pooling EUR Deferred Funding Rate is a simple, robust and representative depiction of the cost of Pan-European wholesale short-term secured funding and strongly correlated to EONIA and could easily be adopted as the new RFR benchmark rate

A photograph of a modern building with a glass facade. The building is viewed from a low angle, looking up. The sky is a pale blue. A white, semi-transparent rectangular box is overlaid on the left side of the image. Inside this box, the number '1' is written in a large, blue, sans-serif font. Below the '1' is a horizontal line, and below the line, the words 'GC Pooling' are written in a smaller, blue, sans-serif font. The building's facade features a grid of windows and a prominent white geometric pattern that resembles a stylized 'G' or a series of interlocking shapes.

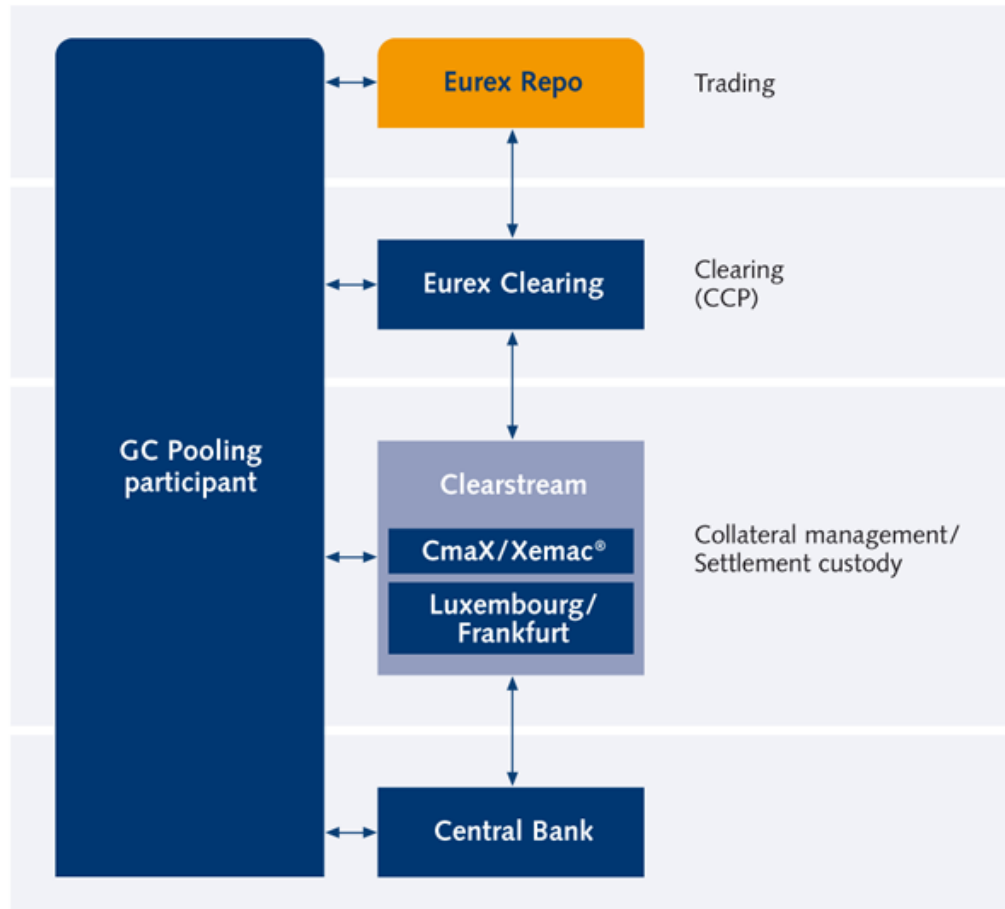
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GC Pooling

GC Pooling – Enables trading with integrated CCP and collateral management

Market Concept and main characteristics

- **Settlement efficiency** – settlement occurs between 5 – 30 minutes from trade execution
- **Elimination of transfer risk** – EUR cash is settled directly into the participants TARGET2 account
- **Flexibility** – EUR GC Pooling can be traded from 07:30 – 18:00 CET (until 17:00 CET for SameDay settlement)
- **Standardisation** – only 4 standardised baskets can be traded which focuses liquidity
- **Balance sheet & settlement netting** – significant reduction of balance sheet cost and operational risk achievable



Baskets of the GC Pooling Market

GC Pooling Basket Overview

Fixed Income

Equity

GC Pooling ECB Basket

- Based on the ECB's Eligible Assets Database (EAD)
- LCR Level 1 compliant
- 4,000 ECB eligible securities
 - Instruments of Central Banks, Central Governments, Regional/Local Governments and Supranationals: Min rating "A-/A3"
 - Traditional and Jumbo "Pfandbrief"-style instruments of credit institutions and Agency Credit Institutions: Min rating "AA- and LCR HQLA compliant"
 - Location of bond issuance: Austria, Belgium, Germany, Netherlands, France, Slovenia, Eurobonds
- Tradable in EUR, USD, CHF and GBP
- Re-use of received collateral with ECB/ Bundesbank and Eurex Clearing (margining)
- Repo trade tenors up to two years

GC Pooling ECB EXTended Basket

- Based on the ECB's Eligible Assets Database (EAD)
- 14,000 ECB eligible securities
 - Excluded are (Treasury) Bills, Commercial Papers and Certificates of Deposit issued by corporate issuers and Agency Non-credit Institutions as well as all assets defined as ABS/MBS and other securitized bonds
 - Location of bond issuance: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Malta, Slovenia, Spain, Netherlands, Eurobonds
 - Assets rated below "BBB-/Baa3" are not eligible.
- Tradable in EUR, USD, CHF and GBP
- Re-use of received collateral with Eurex Clearing (margining)
- Repo Trade tenors up to two years

GC Pooling INT MXQ Basket

- Based on the Admissible Securities list of Eurex Clearing
- Min rating "AA-/Aa3"
- 2,000 eligible securities from central banks and supranational issuers
- Bonds may be denominated in AUD, CAD, CHF, DKK, EUR (only non-ECB eligible), GBP, JPY, NOK, SEK and USD.
- Tradable in EUR, USD, CHF and GBP
- Re-use of received collateral with Eurex Clearing (margining)
- Trade tenors up to two years

EQ GC Pooling Basket

- Components of AEX25, CAC40, EUROSTOXX50, DAX
- Around 100 components
- Tradable in EUR, USD, CHF, GBP
- Equity Collateral Haircut between 7-20%
- Corporate Action (income and non-income events): Compensation payments
- Corporate Action (non-income events): To be treated as ineligible and substituted out of the collateral pool
- Re-use of received collateral with Eurex Clearing (margining)
- Trade tenors up to two years

GC Pooling provides a homogeneous funding tool for Eurozone capital markets

Average EUR GC Pooling ECB & ECB EXT allocated collateral by Issuer Residence – 2017

EUR GC Pooling ECB Basket*	100%
Germany	50,566%
Supranational	13,533%
France	13,246%
Austria	9,613%
Denmark	3,733%
Belgium	2,650%
United Kingdom	1,951%
Netherlands	1,459%
Finland	1,200%
Swede	0,977%
Czech Republic	0,588%
Slovakia	0,224%
Hungary	0,171%
Poland	0,074%
Luxembourg	0,012%
Slovenia	0,003%

EUR GC Pooling ECB EXT Basket*	100%
Spain	32,185%
Italy	23,786%
Germany	8,940%
France	5,869%
United Kingdom	4,504%
Austria	3,861%
Supranational	3,595%
Denmark	3,281%
Netherlands	2,857%
Ireland	2,373%
Canada	1,562%
Norway	1,007%
Iceland	0,885%
Swede	0,872%
United States	0,780%
Belgium	0,740%
Luxembourg	0,622%
Finland	0,589%
Slovenia	0,461%
Switzerland	0,357%
Poland	0,276%
Czech Republic	0,242%
Hungary	0,205%
Slovakia	0,094%
Japan	0,055%

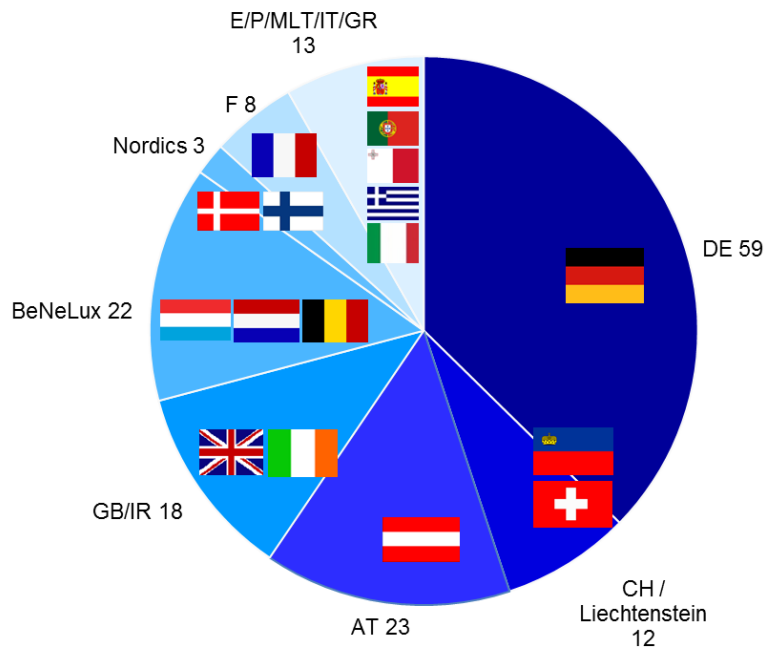
Total	100%
Germany	29,647%
Spain	16,175%
Italy	11,954%
France	9,539%
Supranational	8,539%
Austria	6,722%
Denmark	3,506%
United Kingdom	3,234%
Netherlands	2,162%
Belgium	1,690%
Ireland	1,192%
Swede	0,924%
Finland	0,893%
Canada	0,785%
Norway	0,506%
Iceland	0,445%
Czech Republic	0,414%
United States	0,392%
Luxembourg	0,319%
Slovenia	0,233%
Hungary	0,188%
Switzerland	0,179%
Poland	0,176%
Slovakia	0,159%
Japan	0,028%

*Eurex Repo GC Pooling ECB & ECB EXT Basket Definition: <http://www.eurexrepo.com/repo-en/products/gcpooling>

Eurex Repo – Pan-European Participants Structure

Geographical Expansion as of 2 January 2018

Continuous growth of participants across Europe



Total: 158 Participants
 Thereof: 132 GC Pooling and 143 Repo Market

Type of participants

- Credit institutions
- Central banks e.g. Banque Centrale du Luxembourg, Swiss National Bank
- Finance Agencies e.g. German and Dutch Finance Agency
- German regional countries
- Supranational organizations e.g. European Investment Bank (EIB), EFSF, ESM
- Corporates and Insurance Companies (Select Invest and Select Finance participants)
- Brokers

Top 20 Distribution in Traded Volume 1 Aug 2015 – 15 Jan 2018

Average Daily Traded EUR Volume for ECB & ECB EXT Basket TomNext, SpotNext and Overnight transactions from 1 Aug 2015 – 15 Jan 2018

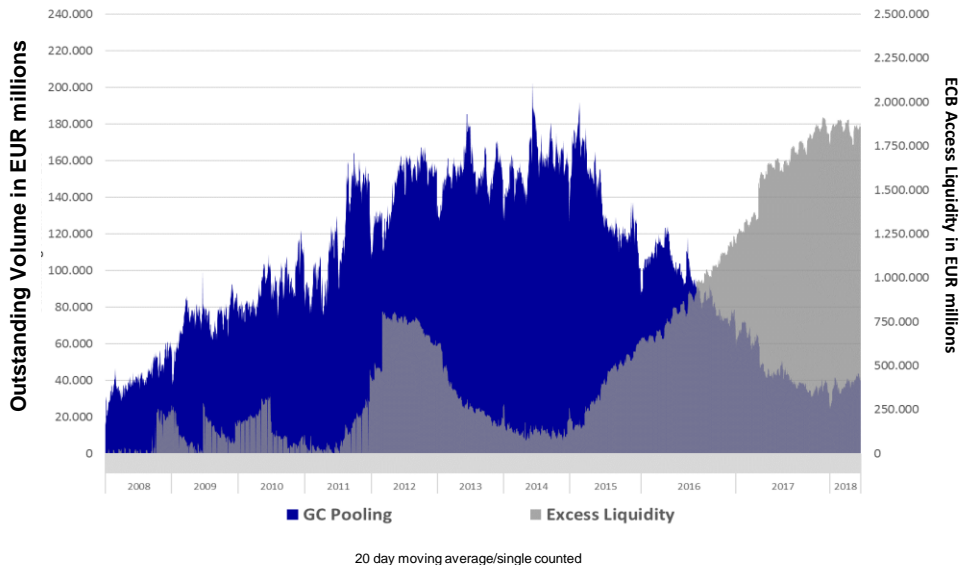
Top 5 Clients	Share of Average Daily Traded Volume
Total	43,41%

Top 10 Clients	Share of Average Daily Traded Volume
Total	60,78%

Top 20 Clients	Share of Average Daily Traded Volume
Total	80,18%

- Total of 131 participants* across 17 countries admitted for GC Pooling
 - Thereof, 118 active participants trading from Aug15 – Jan18
 - Thereof, 32 daily trading clients on average
 - Eight countries are represented in the Top 20 clients (Three countries in Top 5 / Four countries in Top 10)

GC Pooling provides continuous liquidity during times of stress and represents a substitute to central bank liquidity



- EUR Deferred Funding Rate trading volumes increased while EONIA volumes stagnated or dropped over last 8 years
- During 2014 Southern European Sovereign debt crises volumes surged as banks preferred secured funding via CCP and recognised that they could more easily receive funding through GC Pooling's wide baskets
- GC Pooling trading volumes continue to be significantly higher than EONIA during problematic month, quarter and year ends

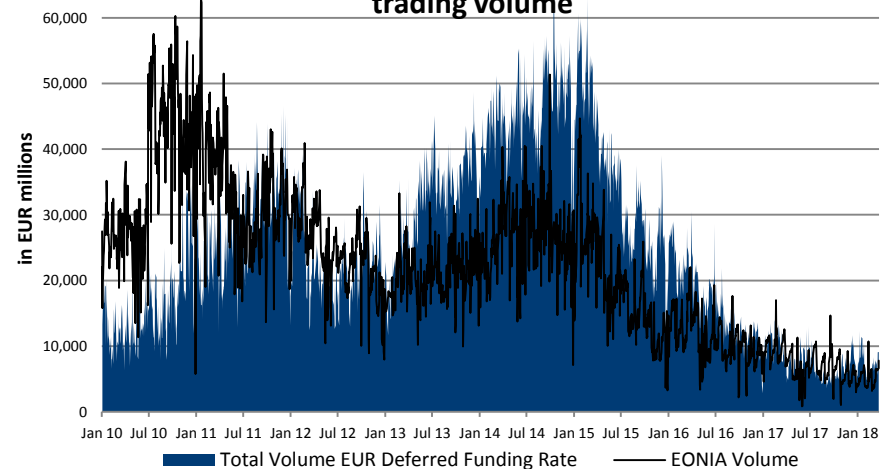
- Central bank liquidity injection is the key driver of current GC Pooling repo rates and volume development
- Correlation between Excess Liquidity (Bloomberg ticker: ECBLXLIQ <Index>) and Outstanding GC Pooling Volume:

2015: -0,94

2016: -0,89

2017: -0,90

EONIA vs. STOXX GC Pooling EUR Deferred Funding trading volume



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STOXX GC Pooling Deferred Funding Rate

Retail	11.9849	4.008
MED	13.1979	4.008
DOCLS1		
PARA		
PRA		
CONSUM	40.7458	
ADSM		
HEHS		
ENG		
	1.0119	4.008
	1.0119	4.008
	1.0119	4.008

STOXX Ltd. is a leading global index provider

- STOXX is 100% owned by Deutsche Börse Group, one of the world's leading exchange organizations
- Headquartered in Zurich; offices in Frankfurt, London, New York, Sydney, Hong Kong and Tokyo
- Since its inception in 1998, STOXX has been valued by the market as a provider of neutral, transparent and strictly rules-based indices
- STOXX has more than 110 employees globally and calculates more than 12,000 indices daily incl. the global benchmarks EURO STOXX 50®, STOXX® Europe 600 and DAX®
- STOXX was one of the first adopters of the IOSCO Principles for Financial Benchmarks
- Approx. 500 companies around the world use STOXX underlyings for exchange-traded funds (ETFs), futures and options, structured products and passively managed investment funds
- STOXX is Europe's largest and the world's second largest index provider in the derivatives segment

STOXX GC Pooling EUR Deferred Funding Rate accurately and reliably depicts Pan-European secured EUR funding cost (1/2)

Main characteristics

1. Simple

- 100% transaction based
- Combines trades in EUR GC Pooling ECB and ECB EXTended basket, i.e. the benchmark collateral baskets for funding purposes in Europe
- Rate is simple volume weighted average of all repo trades in both baskets for 3 tenors but with identical front leg settlement, i.e. Overnight repos traded today, TomNext repos traded yesterday and SpotNext repos traded the day before yesterday

2. Transparent

- Historic data since Jan 2010 available on Bloomberg and Reuters
- Individual basket volumes and repo rates available for each tenor (intraday & end of day)
- Daily Deferred Funding Rate easily replicable

3. Robust

- All trades on MiFID II compliant, EU 27 domiciled multilateral trading facility
- Only anonymous central limit order book transactions
- All GC Pooling repos are centrally cleared

STOXX GC Pooling EUR Deferred Funding Rate accurately and reliably depicts Pan-European secured Euro funding cost (2/2)

Main characteristics

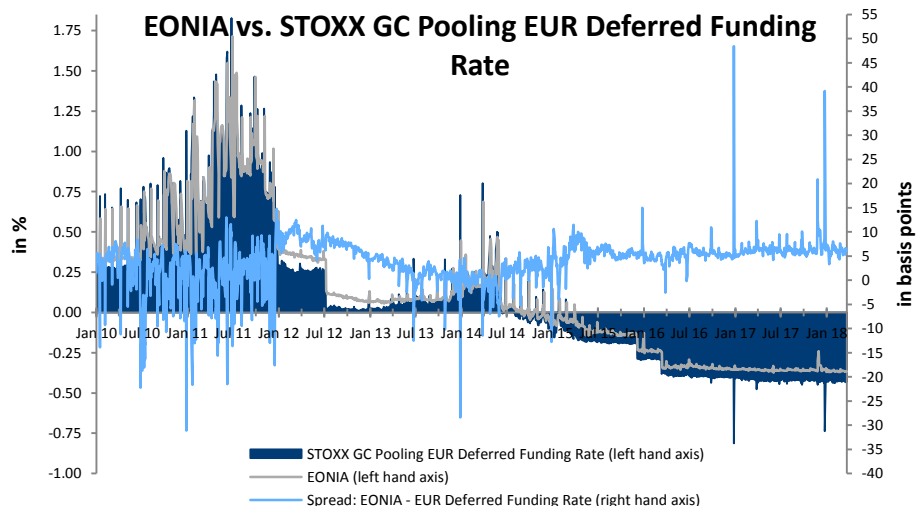
4. Representative

- 132+ market participants from 17 countries covering approx. 14,000 ISINs of ECB eligible collateral
- High positive correlation to EONIA rate
- Volumes reliably increased during times of market stress
- Volumes inversely correlated to ECB Excess liquidity provision

5. Future proof

- All GC Pooling repos are centrally cleared on ESMA authorised and EU27 domiciled CCP
- Focus on two wide Pan-European baskets addresses rating migration, initial margin and collateral eligibility concerns associated with CCPs
- Development of derivatives and term structure relatively easy as only 2 homogenous baskets
- Eurex Exchange already listed a cash settled futures contract in Dec 2014 whilst the ECB replaced Eurepo with the STOXX GC Pooling ECB basket term indices

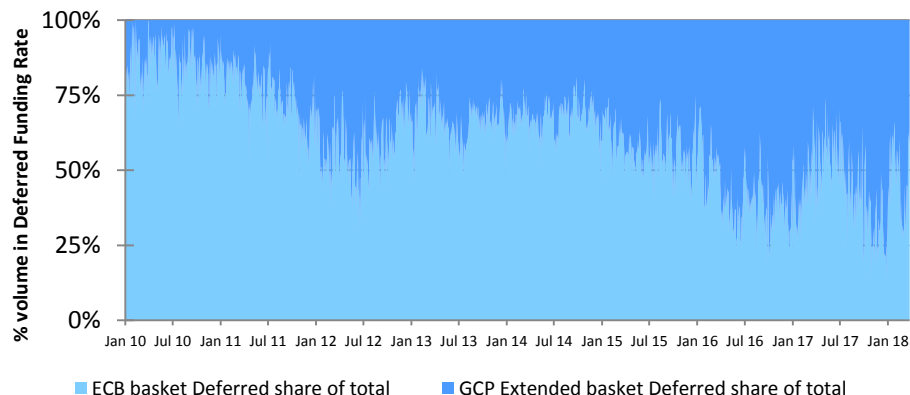
Deferred Funding Rate shows high correlation and limited spread to EONIA which should greatly reduce adoption costs



- Since inception, very high correlation of 99.5% between STOXX GC Pooling EUR Deferred Funding Rate and EONIA
- Deferred Funding Rate correctly captured the year end and quarter end squeezes observed in European repo markets
- Average interest rate differential to EONIA of around 6bps since Jan 2015

- Deferred Funding Rate provides unique insight into evolution of funding patterns and the impact of rating migration, e.g.
 - Credit rating downgrade of Italy in January 2012 shifted funding to EXTended basket
 - ECB QE has gradually reduced share of ECB basket as funding outside of GC Pooling becomes more attractive over last 8 years

GC Pooling ECB basket & ECB EXTended relative volume shares in STOXX GC Pooling EUR Deferred Funding Rate



Conclusion

- STOXX GC Pooling EUR Deferred Funding Rate fulfils the criteria to become the EUR RFR Benchmark
- Index Provider STOXX has the necessary experience, expertise and resources to administer the benchmark
- The underlying GC Pooling baskets succeed in delivering a homogenous funding tool to the Eurozone credit market

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Appendix



STOXX GC Pooling index family (1/2)

Term	GC Pooling Basket	Index	ISIN	Bloomberg Ticker	Reuters RIC
OverNight	ECB	STOXX GC Pooling EUR ON Index	DE000A0Z3MN7	SGCPON	.STXGCPION
OverNight	ECB	STOXX GC Pooling EUR ON Index Volume	DE000A0Z3MP2	SGCPONV	.STXGCPIONV
OverNight	ECB Ext	STOXX GC Pooling EUR Extended ON Index	DE000A0Z3MQ0	SGCPXON	.STXGCPIXON
OverNight	ECB Ext	STOXX GC Pooling EUR Extended ON Index Volume	DE000A0Z3MR8	SGCPXONV	.STXGCPIXONV
TomNext	ECB	STOXX GC Pooling EUR TN Index	DE000A0Z3MS6	SGCPTN	.STXGCPI TN
TomNext	ECB	STOXX GC Pooling EUR TN Index Volume	DE000A0Z3MT4	SGCPTNV	.STXGCPI TNV
TomNext	ECB Ext	STOXX GC Pooling EUR Extended TN Index	DE000A0Z3MU2	SGCPXTN	.STXGCPIXTN
TomNext	ECB Ext	STOXX GC Pooling EUR Extended TN Index Volume	DE000A0Z3MV0	SGCPXTNV	.STXGCPIXTNV
SpotNext	ECB	STOXX GC Pooling EUR SN Index	DE000A0Z3MW8	SGCPSN	.STXGCPI SN
SpotNext	ECB	STOXX GC Pooling EUR SN Index Volume	DE000A0Z3MX6	SGCPSNV	.STXGCPI SNV
SpotNext	ECB Ext	STOXX GC Pooling EUR Extended SN Index	DE000A0Z3MY4	SGCPXSN	.STXGCPIXSN
SpotNext	ECB Ext	STOXX GC Pooling EUR Extended SN Index Volume	DE000A0Z3MZ1	SGCPXSNV	.STXGCPIXSNV
ON/TN/SN	ECB/ECB Ext	STOXX GC Pooling EUR Funding Rate	DE000A0Z3M09	SGCPFR	.STXGCPIFR
ON/TN/SN	ECB/ECB Ext	STOXX GC Pooling EUR Funding Rate Volume	DE000A0Z3M17	SGCPFRV	.STXGCPIFRV
ON/TN/SN	ECB/ECB Ext	STOXX GC Pooling EUR Deferred Funding Rate	DE000A1X21E8	SGCPDFR	.STXGCPIFR
ON/TN/SN	ECB/ECB Ext	STOXX GC Pooling EUR Deferred Funding Rate Volume	DE000A1X21F5	SGCPDFRV	.STXGCPIFRV
1 week	ECB	STOXX GC Pooling EUR 1 Week Index	DE000A1X21G3	SGCP1W	.STXGCPI1W
1 week	ECB	STOXX GC Pooling EUR 1 Week Index Volume	DE000A1X21H1	SGCP1WV	.STXGCPI1WV
2 weeks	ECB	STOXX GC Pooling EUR 2 Weeks Index	DE000A1X21K5	SGCP2W	.STXGCPI2W
2 weeks	ECB	STOXX GC Pooling EUR 2 Weeks Index Volume	DE000A1X21L3	SGCP2WV	.STXGCPI2WV
1 month	ECB	STOXX GC Pooling EUR 1 Month Index	DE000A1X21N9	SGCP1M	.STXGCPI1M
1 month	ECB	STOXX GC Pooling EUR 1 Month Index Volume	DE000A1X21P4	SGCP1MV	.STXGCPI1MV
3 months	ECB	STOXX GC Pooling EUR 3 Months Index	DE000A1X21R0	SGCP3M	.STXGCPI3M
3 months	ECB	STOXX GC Pooling EUR 3 Months Index Volume	DE000A1X21S8	SGCP3MV	.STXGCPI3MV
6 months	ECB	STOXX GC Pooling EUR 6 Months Index	DE000A1X21U4	SGCP6M	.STXGCPI6M
6 months	ECB	STOXX GC Pooling EUR 6 Months Index Volume	DE000A1X21V2	SGCP6MV	.STXGCPI6MV
9 months	ECB	STOXX GC Pooling EUR 9 Months Index	DE000A1X21X8	SGCP9M	.STXGCPI9M
9 months	ECB	STOXX GC Pooling EUR 9 Months Index Volume	DE000A1X21Y6	SGCP9MV	.STXGCPI9MV
12 months	ECB	STOXX GC Pooling EUR 12 Months Index	DE000A1X2202	SGCP12M	.STXGCPI12M
12 months	ECB	STOXX GC Pooling EUR 12 Months Index Volume	DE000A1X2210	SGCP12MV	.STXGCPI12MV

STOXX GC Pooling index family (2/2)

Term	GC Pooling Basket	Index	ISIN	Bloomberg Ticker	Reuters RIC
OverNight	ECB	STOXX GC Pooling EUR ON Current Index	DE000A1X2160	SGCPONC	.STXGCPIONC
OverNight	ECB Ext	STOXX GC Pooling EUR Extended ON Current Index	DE000A1X2178	SGCPXONC	.STXGCPXONC
TomNext	ECB	STOXX GC Pooling EUR TN Current Index	DE000A1X2186	SGCPTNC	.STXGCPITNC
TomNext	ECB Ext	STOXX GC Pooling EUR Extended TN Current Index	DE000A1X2194	SGCPXTNC	.STXGCPXTNC
SpotNext	ECB	STOXX GC Pooling EUR SN Current Index	DE000A1X21A6	SGCPSNC	.STXGCPISNC
SpotNext	ECB Ext	STOXX GC Pooling EUR Extended SN Current Index	DE000A1X21B4	SGCPXSNC	.STXGCPXSNC
ON/TN/SN	ECB/ECB Ext	STOXX GC Pooling EUR Deposit Index	DE000A1X21C2	SGCPDI	.STXGCPDI
ON/TN/SN	ECB/ECB Ext	STOXX GC Pooling EUR Investable Deposit Index	DE000A1X21D0	SGCPIDI	.STXGCPIDI
1 week	ECB	STOXX GC Pooling EUR 1 Week Current Index	DE000A1X21J7	SGCP1WC	.STXGCP1WC
2 weeks	ECB	STOXX GC Pooling EUR 2 Weeks Current Index	DE000A1X21M1	SGCP2WC	.STXGCP2WC
1 month	ECB	STOXX GC Pooling EUR 1 Month Current Index	DE000A1X21Q2	SGCP1MC	.STXGCP1MC
3 months	ECB	STOXX GC Pooling EUR 3 Months Current Index	DE000A1X21T6	SGCP3MC	.STXGCP3MC
6 months	ECB	STOXX GC Pooling EUR 6 Months Current Index	DE000A1X21W0	SGCP6MC	.STXGCP6MC
9 months	ECB	STOXX GC Pooling EUR 9 Months Current Index	DE000A1X21Z3	SGCP9MC	.STXGCP9MC
12 months	ECB	STOXX GC Pooling EUR 12 Months Current Index	DE000A1X22Z8	SGCP12MC	.STXGCP12MC

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