INTEREST RATES

A User's Guide to CME SONIA Futures

OCTOBER 2018

This note introduces MPC SONIA futures and Quarterly IMM SONIA futures.

In what follows, Section 1 summarizes the background and workings of the SONIA benchmark. Sections 2 and 3, respectively, discuss terms and conditions for MPC SONIA futures and Quarterly IMM SONIA futures. (The corresponding futures product rules are set forth in Appendixes B and C, respectively.) Section 4 remarks briefly on initial margin levels and margin spread credits. Exchange and quote vendor product codes appear in Appendix A.

(1) SONIA

In 2015 the Bank of England ("BOE") convened the Working Group on Sterling Risk-Free Reference Rates ("Working Group") "to identify and implement a near-risk free reference rate … as an alternative to sterling LIBOR."[1] In April 2017, the Working Group endorsed the Sterling Overnight Index Average ("SONIA") as the interest rate benchmark that, in its consensus view, would represent best practice for use as the underlying reference in new sterling interest rate derivatives and other sterling-denominated financial contracts.[2]

From its birth in 1997, SONIA was administered by the Wholesale Market Brokers' Association ("WMBA"), and was computed as the transaction-volume-weighted average interest rate for all sterling-denominated unsecured overnight funding transactions brokered in London by WMBA member firms between midnight and 4:15pm London time, with all counterparties, in minimum trade size of £25 million. In April 2016, the BOE became the benchmark administrator, with WMBA remaining as agent for calculation and publication. On 20 April 2018, the BOE assumed responsibility for these rôles, in addition to administration, and introduced both an expanded data universe and a new and more robust calculation scheme.

Today, the SONIA benchmark gauges the rate per annum at which interest is paid on sterling short-term wholesale funds in circumstances where credit, liquidity, and other risks are minimal.[3] For any weekday that is not a London bank holiday ("London banking day"),[4] SONIA is computed as the transaction-volume-weighted interquartile average of interest rates paid on eligible sterling-denominated deposit transactions. That is, for any London banking day, the BOE:

(i) ranks that day's eligible transactions by their corresponding interest rates, from lowest to highest, then

(ii) removes 25 percent of trading volume corresponding to the lowest interest rate levels and 25 percent of trading volume corresponding to the highest interest rate levels, then

(iii) computes a transaction-weighted arithmetic average interest rate using the remaining interest-rate/trade-size data pairs (which represent the central 50 percent of probability mass for that day's transaction-volume-weighted distribution of interest rates).

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1 *See Working Group on Sterling Risk-Free Reference Rates, Design Criteria for a Sterling Secured Overnight Money Market Benchmark, 16 December 2015, available at: https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/design-criteria-for-a-sterling-secured-overnight-money-market-benchmark.pdf?la=en&hash=5A5455F471C04C5713B67214EE58534A3C2E995C*

2 *See Bank of England, SONIA recommended as the sterling near risk-free interest rate benchmark, 28 April 2017, available at: https://www.bankofengland.co.uk/-/media/boe/files/news/2017/april/sonia-recommended-as-the-sterling-near-risk-free-interest-rate-benchmark.pdf?la=en&hash=4AF00716EA43928FEBA30FA3523CDA9437ABE0B0*

3 *See Bank of England, SONIA – Key features and polices, May 2018, available at: https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/sonia-key-features-and-policies.pdf?la=en&hash=A11D3AE9E5A070702AE4F777A70C258E871E49B7*

4 *For information on London bank holidays, see: https://www.gov.uk/bank-holidays*

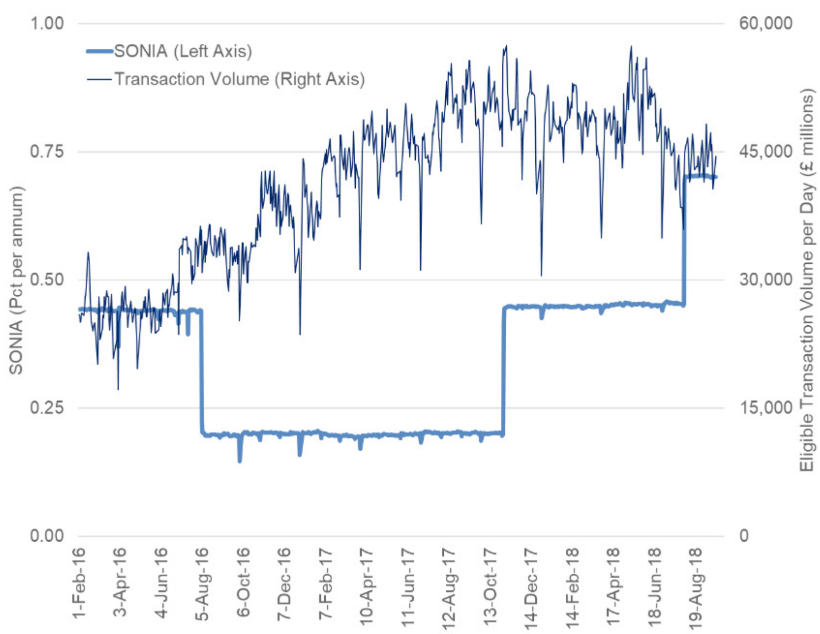
On any London banking day, the eligibility criteria for a sterling-denominated deposit transaction to be included in this calculation are that it must be:

- reported to the BOE Sterling Money Market daily data collection, in accordance with the 'Reporting Instructions for Form SMMD' that are in effect on such London banking day,[5]
- unsecured,
- executed between 12:00am and 6:00pm London time on such London banking day,
- for same-day settlement,
- for term to maturity of one London banking day, and
- for principal amount of £25 million or more.

The BOE publishes the resultant SONIA value at 9:00am London time on the next London banking day.[6]

The BOE has published estimates of hypothetical historical daily SONIA values and transaction volumes for the spell from 1 February 2016 to 20 April 2018, computed according to the methodology sketched above.[7] Exhibit 1 depicts these data, augmented by live data for 23 April through 31 August 2018.

Exhibit 1 – Daily SONIA and Eligible Transaction Volumes, 1 February 2016 to 31 August 2018



Source: BOE

5 *See Bank of England, Sterling Money Market Data Collection – Reporting Instructions for Form SMMD, Version 4.1, June 2018, available at: https://www.bankofengland.co.uk/-/media/boe/files/statistics/data-collection/smm/instructions_smm.pdf*

6 *Each daily publication includes, in addition to the SONIA value for the preceding London banking day, other descriptive statistics for the trade-volume-weighted distribution of interest rates on eligible transactions for the preceding London banking day. The SONIA value for any London banking day is made freely available via the BOE Interactive Statistical Database (http://www.bankofengland.co.uk/boeapps/database/) no later than 10:00am London time on the London banking day following the first day on which such SONIA value was initially published. See Bank of England, SONIA – Key features and polices, May 2018, op cit.*

7 *See Bank of England, Data presented in the SONIA key features and policies document, available at: https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/soniareform0518.xlsx?la=en&hash=AB5931770339EBFBA2220F22D58E9B14667C4E3F*

During this two-year seven-month interval, median daily transaction volume is £44 bln. Important from the standpoint of benchmark reliability and robustness is that minimum daily transaction volume is £17.2 bln. With eligible transaction volumes having trended higher during this period, moreover, it's worth scrutinizing a recent subset of the data. For the 12 months from September 2017 through August 2018, for instance, median daily transaction volume is nearly £49 bln, with minimum daily volume of £30.5 bln.

The BOE's published estimates of hypothetical historical data also include daily counts of eligible transactions. These trade incidence data bespeak the same robustness as is evidenced in the aggregate daily trading volumes. Between 1 February 2016 and 20 April 2018, for example, the median daily number of eligible trades is around 350, and the minimum is 208.

(2) Contract Specifications for MPC SONIA Futures

... are summarized in Exhibit 2. A MPC SONIA futures contract for a given delivery month is based on market expectations of compounded daily SONIA interest during the contract's Reference Interval, which:

- starts on (and includes) the scheduled date of a policy announcement by the BOE Monetary Policy Committee ("MPC"), specified as occurring in the contract month, and
- ends on (but excludes) the scheduled date of the next following policy announcement by the MPC, specified as occurring in the contract delivery month.

Both dates are as published by the BOE prior to the exchange's listing of the futures contract for trading. Once the start date and the end date of any contract's Reference Interval have been determined, and the exchange has listed the contract for trading, the Reference Interval shall remain as specified until contract final settlement, irrespective of any subsequent announcement by the BOE that either or both of the corresponding MPC policy announcement dates have been rescheduled.

> ***Example:*** On 19 October 2017, the BOE published the schedule for the eight MPC announcement dates in 2018.[8] Of these, the sixth falls on Thursday, 13 September, and the seventh occurs on Thursday, 1 November. Accordingly, for a MPC SONIA futures contract for which the contract month is September 2018 ("U8") and the delivery month is November 2018 (ie, MPCU8), the Reference Interval shall be defined so as to span from (and to include) 13 September to (and excluding) 1 November.

At launch, contract months listed for trading are as follows:

Contract Month	Contract Code	Reference Interval starts on and includes:	Reference Interval ends on and excludes:
Sep 2018	MPCU8	13 Sep 2018	1 Nov 2018
Nov 2018	MPCX8	1 Nov 2018	20 Dec 2018
Dec 2018	MPCZ8	20 Dec 2018	7 Feb 2019
Feb 2019	MPCG9	7 Feb 2019	21 Mar 2019

Price Basis and Unit of Trade

Prices are quoted and made in terms of the IMM Index, ie, 100 minus the contract interest rate. For a contract for a given Delivery Month, the contract rate is compounded daily SONIA interest during the corresponding Reference Interval, expressed as an interest rate per annum. For instance, a price of 98.760 Index points signifies a contract rate of 1.24 percent per annum.

8 *Bank of England, Updated Monetary Policy Committee dates for 2018, News release, October 19, 2017, available at: file:///H:/Fred/My%20Documents/Europe%20MM%20Rates/BOE%202018%20MPC%20Dates%202017Oct19.pdf*

Exhibit 2 – Contract Specifications for CME MPC SONIA Futures

All times of day are Central Time ("CT") unless otherwise noted.

Trading Unit	Compounded daily SONIA interest during contract Reference Interval, such that each basis point per annum = £25 per contract. ***Reference Interval:*** For a given contract, interval from (and including) the scheduled MPC announcement date preceding the Delivery Month, to (and not including) the scheduled MPC announcement date in the Delivery Month.
Price Basis	Contract-grade IMM Index: 100 minus R R = Compounded daily SONIA interest during contract Reference Interval. (See ***Delivery***.)
Contract Size	£2,500 x contract-grade IMM Index
Minimum Price Increment	*Nearby Contract:* 0.0025 IMM Index points (¼ basis point per annum) equal to £6.25 per contract *All Other Contracts:* 0.005 IMM Index points (½ basis point per annum) equal to £12.50 per contract
Delivery Months	Nearest four (4) Reference Intervals for which Bank of England has published MPC announcement dates. First nearby listed contract: Contract Month = Sep 2018 (i.e., Delivery Month = Nov 2018). For each contract, *Contract Month* is the month in which Reference Interval begins. *Example:* For the Sep 2018 contract, Reference Interval starts on (and includes) Thursday, 13 Sep 2018, and ends with (and does not include) Thursday, 1 Nov 2018, the contract Delivery Month.
Termination of Trading	*Last Day of Trading:* Scheduled MPC announcement date in Delivery Month, as published by BOE. *Termination of Trading:* 9:00am London time on Last Day of Trading.
Delivery	By cash settlement, by reference to Final Settlement Price, on first UK banking day immediately following conclusion of contract Reference Interval (typically, the scheduled MPC announcement date in the Delivery Month). ***Final Settlement Price:*** Contract-grade IMM Index (100 minus R) evaluated on the basis of realized SONIA values during Contract Reference Interval: R = $[\ \Pi_{i=1 \ldots n} \{1+(d_i /365)*(ri /100)\} - 1\ ] \times (365/D) \times 100$ n = Number of UK banking days in the Reference Interval i ~ Running variable indexing UK banking days during Reference Interval, $i = 1,2,\ldots,(n-1),n$. $\Pi_{i=1\ldots n}$ denotes the product of values indexed by the running variable, $i = 1,2,\ldots,n$. r_i = SONIA value for i^{th} UK banking day d_i = Number of calendar days to which r_i applies D = $\Sigma_i d_i$ (*ie*, number of calendar days in Reference Interval)
Trading Venues and Hours	CME Globex and CME ClearPort: 5pm to 4pm CT, Sun-Fri.
CME Globex Algorithm	Allocation (A Algorithm, with Top Order Allocation = 100% and Pro Rata Allocation = 100%)
Position Reporting and Accountability	*Reporting Level:* 500 contracts *Accountability Threshold:* 1,000 contracts
Block Trade Minimum	100 contracts
Commodity Code	MPC

Termination of Trading, Final Settlement, and the Reference Interval

Trading in an expiring contract terminates on the scheduled MPC announcement date occurring in the contract delivery month, at 9:00am London time when the BOE is regularly scheduled to publish the SONIA value for the last day of the expiring contract's Reference Interval. Delivery on an expiring contract is by cash settlement, through a final mark-to-market made by reference to the contract final settlement price. The final settlement price is the contract IMM Index, 100 minus R, with R evaluated as the compounded daily SONIA rate per annum during the contract Reference Interval:

R	=	$[\Pi_{i=1 \ldots n} \{1+(d_i/365)*(r_i/100)\} - 1] \text{ x } (365/D) \text{ x } 100$
n	=	the number of London banking days during the Reference Interval
i		a running variable that indexes each London banking day during the Reference Interval, such that *i* takes the values *i* = 1,2,…,(n-1),n.
$\Pi_{i=1 \ldots n}$		denotes the product of values indexed by the running variable, $i = 1,2,\ldots,n$.
r_i	=	the SONIA value for the i^{th} London banking day
d_i	=	the number of calendar days to which r_i applies. For example, if the i^{th} day is a Monday, a Tuesday, a Wednesday, or a Thursday, and if the next following calendar day is a London banking day, then $d_i = 1$. If the i^{th} day is a Friday, and if the next following Monday is a London banking day, then $d_i = 3$.
D	=	the number of calendar days in the Reference Interval, ie, $D = \Sigma_i d_i$

Exhibit 3 illustrates final settlement price determination for hypothetical August 2018 MPC SONIA (MPCQ8) futures, for which the Reference Interval would have covered the span between MPC announcement dates on 2 August and 13 September. Consider the data entries for Friday, 3 August, in the second row:

- SONIA is 0.7028 pct (or 70.28 basis points) per year, for settlement on the same day and for repayment on the next London banking day.
- Friday's SONIA value, moreover, applies as simple interest for the three days over the ensuing weekend.
- The interest accumulation value in the right-hand column indicates the return of principal and payment of interest for a funding transaction with principal amount of £1: 1.000057764 = 1 + (3 days / 365 days/yr) x (0.7028 pct/yr / 100).

On the morning of 13 September, after the BOE has published the SONIA value for Wednesday, 12 September, the exchange would have determined the expiring MPCQ8 contract's final settlement interest rate, R, as indicated above. That is, it would have obtained the product of the daily interest accumulation factors throughout the contract Reference Interval, subtracted one, then multiplied by (365 days/yr) / (42 days) to achieve an interest rate per annum of 0.702973.

Rounded to four decimal places, this would become R = 0.7030 pct/yr. Thus, the final settlement price – the contract IMM Index evaluated at the final settlement value of R – would have been: 99.2970 = 100 minus 0.7030.

Exhibit 3 – Final Settlement Price Determination – Hypothetical MPCQ8

Date	Daycount	SONIA (Pct per Yr)	Interest Accumulation
2-Aug	1	0.6897	1.000018896
3-Aug	3	0.7028	1.000057764
6-Aug	1	0.7006	1.000019195
7-Aug	1	0.7011	1.000019208
8-Aug	1	0.7028	1.000019255
9-Aug	1	0.7019	1.000019230
10-Aug	3	0.7035	1.000057822
13-Aug	1	0.7037	1.000019279
14-Aug	1	0.7021	1.000019236
15-Aug	1	0.7018	1.000019227
16-Aug	1	0.7024	1.000019244
17-Aug	3	0.7030	1.000057781
20-Aug	1	0.7039	1.000019285
21-Aug	1	0.7037	1.000019279

Date	Daycount	SONIA (Pct per Yr)	Interest Accumulation
22-Aug	1	0.7028	1.000019255
23-Aug	1	0.7035	1.000019274
24-Aug	4	0.7036	1.000077107
28-Aug	1	0.7032	1.000019266
29-Aug	1	0.7048	1.000019310
30-Aug	1	0.7058	1.000019337
31-Aug	3	0.7042	1.000057879
3-Sep	1	0.7020	1.000019233
4-Sep	1	0.7046	1.000019304
5-Sep	1	0.7022	1.000019238
6-Sep	1	0.7032	1.000019266
7-Sep	3	0.7028	1.000057764
10-Sep	1	0.7016	1.000019222
11-Sep	1	0.7003	1.000019186
12-Sep	1	0.7025	1.000019247
13-Sep		Final Settlement Rate = 0.7030	Final Settlement Price = 99.2970

Data Source: BOE

(3) Contract Specifications for Quarterly IMM SONIA Futures

Exhibit 4 summarizes Quarterly IMM SONIA ("SON") futures contract specifications, which closely resemble those for MPC SONIA futures. The chief difference is that the interval of interest rate exposure in a SON futures contract is the contract Reference Quarter, which typically will span 13 weeks. Specifically, for a given delivery month, the Reference Quarter will run from (and will include) the third Wednesday of the third month preceding the delivery month, until (and excluding) the third Wednesday of the delivery month.

Once a start date and end date for a contract's Reference Quarter have been specified, and the exchange has listed the contract for trading, the Reference Quarter will remain fixed until contract final settlement, irrespective of any subsequently-announced unscheduled London bank holidays.

Price Basis, Final Settlement Price, and Unit of Trade

Like MPC SONIA futures, prices of Quarterly IMM SONIA futures are quoted and made in terms of the IMM Index, *ie*, 100 minus the contract interest rate. For a contract for a given delivery month, the contract rate is compounded daily SONIA interest during the corresponding Reference Quarter, expressed as an interest rate per annum.

The contract is sized at £2,500 times the corresponding IMM Index – 100 minus R, the contract rate — with each basis point per annum of the contract interest rate (*ie*, 0.01 Index points) worth £25 per contract.

Exhibit 4 – Contract Specifications for CME Quarterly IMM SONIA Futures

All times of day are Central Time ("CT") unless otherwise noted.

Trading Unit	Compounded daily SONIA interest during contract Reference Quarter, such that each basis point per annum of interest = £25 per contract. **Reference Quarter:** For a given contract, interval from (and including) 3rd Wed of 3rd month preceding Delivery Month, to (and not including) 3rd Wed of Delivery Month.
Price Basis	Contract-grade IMM Index: *100 minus R* R = Compounded daily SONIA interest during contract Reference Quarter. (See ***Delivery***.) *Example:* Contract price of 97.2850 IMM Index points signifies R = 2.715 percent per annum.
Contract Size	£2,500 x contract-grade IMM Index
Minimum Price Increment	***Any Contract with Four Months or Less Until Last Day of Trading:*** 0.0025 IMM Index points (¼ basis point per annum) equal to £6.25 per contract ***All Other Contracts:*** 0.005 IMM Index points (½ basis point per annum) equal to £12.50 per contract
Delivery Months	Nearest 20 March Quarterly months (Mar, Jun, Sep, Dec). Initial nearby listed contract: Contract Month = Dec 2018 (*i.e.*, Delivery Month = Mar 2019). For each contract, *Contract Month* is the month in which Reference Quarter begins. *Example:* For the Dec 2018 contract, Reference Quarter starts on IMM Wed of Dec 2018 and ends with Termination of Trading on IMM Wed of Mar 2019, the contract Delivery Month.
Termination of Trading	***Last Day of Trading:*** 3rd Wed of Delivery Month. ***Termination of Trading***: 9:00am London time on Last Day of Trading.
Delivery	By cash settlement, by reference to Final Settlement Price, on 3rd Wed of Delivery Month. ***Final Settlement Price:*** Contract-grade IMM Index (100 minus R) evaluated on the basis of realized SONIA values during Contract Reference Quarter: R = $[\Pi_{i=1 \ldots n} \{1+(d_i/365)*(r_i/100)\} - 1] \times (365/D) \times 100$ n = Number of UK banking days in the Reference Interval i ~ Running variable indexing UK banking days during Reference Interval, $i = 1,2,\ldots,(n-1),n$. $\Pi_{i=1 \ldots n}$ denotes the product of values indexed by the running variable, $i = 1,2,\ldots,n$. r_i = SONIA value for i^{th} UK banking day d_i = Number of calendar days to which r_i applies D = $\Sigma_i d_i$ (*ie*, number of calendar days in Reference Quarter)
Trading Venues and Hours	CME Globex and CME ClearPort: 5pm to 4pm CT, Sun-Fri.
CME Globex Algorithm	Allocation (A Algorithm, with Top Order Allocation = 100% and Pro Rata Allocation = 100%)
Position Reporting and Accountability	Reporting Level: 500 contracts Accountability Threshold: 1,000 contracts
Block Trade Minimum	100 contracts
Commodity Code	SON

Computation of the final settlement price of an expiring SON futures contract will be similar to the calculation that applies to an expiring MPC SONIA futures contract, as exemplified in Exhibit 3. The only important difference lies in the contract's interval of interest rate exposure:

- For a SON contract the Reference Quarter almost always spans 13 weeks (approximately 63 London bank business days).
- For a MPC SONIA contract the Reference Interval typically runs seven weeks (roughly 34 London bank business days) but may vary in length from as brief as five weeks (around 24 London bank business days) to as long as eight weeks (around 39 London bank business days).

Contract Critical Dates: Quarterly IMM SONIA Futures versus Three-Month Eurodollar Futures

As a nomenclatural convention, the contract month is the month in which the contract Reference Quarter begins, and the contract delivery month is the month in which the Reference Quarter ends and the contract comes to final settlement.

This convention clarifies the alignment between Quarterly IMM SONIA futures and established IBOR-reference futures products, such as the exchange's Three-Month Eurodollar futures. To see how, consider two contracts:

> A Three-Month Eurodollar ("GE") future comes to final settlement on the Monday before the third Wednesday of December. The final settlement price is based on the US dollar three-month ICE LIBOR® that corresponds to a three-month unsecured bank funding transaction that settles on the third Wednesday of December and that matures three months later.
>
> For a Quarterly IMM SONIA ("SON") futures contract, the Reference Quarter – the interval of interest rate exposure that informs the contract final settlement price – starts on the third Wednesday of December. The contract does not come to final settlement, however, until the third Wednesday of the following March, the London banking day following the last day of the Reference Quarter.

The interval of interest rate exposure that informs the final settlement price for one contract – either December SON or December GE — is the same as for the other. That is, the hypothetical cash market transaction settlement date that corresponds to final settlement of December GE futures matches the start of the contract Reference Quarter for December SON futures.

(4) Margin Levels and Spread Offsets

For MPC SONIA futures, minimum initial margin per contract as of first trading day is £170 for all delivery months. For SON futures, minimum performance bond levels range from £175 per contract for each of the two nearest delivery months to £350 per contract for the most distant eight delivery months (the Blue and Gold contract years, in the parlance of GE futures users). *Holders of various intermarket spreads will benefit from potentially significant reductions in performance bond requirements.* Taking SON futures for example, spread credits as of first trading day range from 30 to 50 percent for spreads against GE futures, from 30 to 45 percent for spreads versus 30-Day Federal Funds futures, from 25 to 45 percent for spreads versus Three-Month SOFR futures, and from 25 to 35 percent for spreads against MPC SONIA futures. See: https://www.cmegroup.com/content/dam/cmegroup/notices/clearing/2018/09/Chadv18-384.pdf

Minimum performance bond levels and spread-related reductions in minimum performance bonds are reviewed regularly by CME Clearing, and are subject to change in response to fluctuations in interest rate volatility or in foreign exchange rate volatility, or to shifts in correlative relationships between different segments of the fixed-income and money markets. Up-to-date maintenance margin levels and intra- and intermarket spread credits are published at: https://www.cmegroup.com/clearing/margins/outright-vol-scans.html#pageNumber=1&sortField=exchange&sortAsc=true

Appendix A
Product Symbols

	MPC SONIA Futures	Quarterly IMM SONIA Futures
CME Globex/Clearing	MPC	SON
Bloomberg	*Outrights:* MPCA <Cmdty> *Calendar Spreads:* MPCMPC <Cmdty> *Butterlies:* MPC:FST <Cmdty> *Condors:* MPC:CST <Cmdty>	*Outrights:* ONSA <Cmdty> *Calendar Spreads:* ONSONS <Cmdty> *Butterlies:* ONS:FST <Cmdty> *Condors:* ONS:CST <Cmdty>
Thomson Reuters Globex Chain RICs	0#1MPZ	0#1SNO
Thomson Reuters Composite Chain RICs	0#1MPZ	0#1SNO
TT	MPC	SON
CQG	MPC	SOI ("ess-oh-eye")
Fidessa	MPC	SON
ION (Pats & FFastFill)	MPC	SON
FIS/SunGard	MPC	SON
Itiviti (Orc and Tbricks)	MPC	SON
Vela	MPC	SON
DTN	MPC	SON

Appendix B
CME Rulebook Chapter 470 — Quarterly IMM SONIA Futures

47000. SCOPE OF CHAPTER

This chapter is limited in application to Quarterly IMM SONIA futures (“futures” or “contract”). In addition to this chapter, futures shall be subject to the general rules and regulations of the Exchange insofar as applicable.

Unless otherwise specified, times referenced herein shall indicate Chicago time.

47001. CONTRACT SPECIFICATIONS

Each contract is valued at £2,500 times the contract-grade IMM Index (Rule 47002.C.).

47002. TRADING SPECIFICATIONS

47002.A. Trading Schedule

Contracts shall be scheduled for trading during such hours and for delivery in such months as may be determined by the Exchange.

47002.B. Trading Unit

For a contract for a given delivery month, the unit of trading shall be compounded daily Sterling Overnight Index Average (“SONIA”) interest during the contract Reference Quarter (Rule 47003.A.1.), expressed as an interest rate per annum for which (i) such interest rate shall accrue on the basis of the actual number of days spanned by such contract Reference Quarter, divided by a 365-day year, and (ii) each basis point per annum of such interest rate shall be worth £25 per futures contract. SONIA shall be as published by the Bank of England (“BOE”).

47002.C. Price Basis and Minimum Price Increments

For a contract for a given delivery month, prices shall be quoted and made in terms of the contract IMM Index (“Index”), 100.0000 minus compounded daily SONIA interest during the contract Reference Quarter, as specified in Rule 47002.B.

> *Example:* Where the value of such compounded daily SONIA is 2.055 percent per annum, it shall be quoted as an Index value of 97.9450.

The minimum price fluctuation shall be 0.005 Index points, equal to £12.50 per contract, *provided that* the minimum price fluctuation shall be 0.0025 Index points, equal to £6.25 per contract, for any contract with four months or less until its termination of trading (Rule 47002.G.), where the applicable four-month interval shall be defined so as to begin on, and to include, either (i) the Monday before the third Wednesday of the fourth month preceding the month in which trading in such contract terminates, if such Monday is a Business Day, or (ii) the Business Day next following such Monday, if such Monday is not a Business Day.

47002.D. Position Limits, Exemptions, Position Accountability and Reportable Levels

The applicable position limits and/or accountability levels, in addition to the reportable levels, are set forth in the Position Limit, Position Accountability and Reportable Level Table in the Interpretations & Special Notices Section of Chapter 5.

A Person seeking an exemption from position limits for bona fide commercial purposes shall apply to the Market Regulation Department on forms provided by the Exchange, and the Market Regulation Department may grant qualified exemptions in its sole discretion.

Refer to Rule 559 for requirements concerning the aggregation of positions and allowable exemptions from the specified position limits.

47002.E. Special Price Fluctuation Limits

At the commencement of each trading day, the contract shall be subject to special price fluctuation limits as set forth in Rule 589 and in the Special Price Fluctuation Limits Table in the Interpretations & Special Notices Section of Chapter 5.

47002.F. [Reserved]

47002.G. Termination of Trading

Trading in an expiring contract shall terminate at 9:00 a.m. London time on the third Wednesday of the contract delivery month.

47002.H. [Reserved]

47003. SETTLEMENT PROCEDURES

Delivery shall be by cash settlement.

47003.A. Final Settlement Price

1. Definition of Reference Quarter

For a contract for a given delivery month, the Reference Quarter shall be the interval that ends on (and does not include) the third Wednesday of the contract delivery month, and that begins on (and includes) the third Wednesday of the third calendar month preceding the contract delivery month.

> ***Example:*** For a hypothetical contract for which the delivery month is March 2022, the contract Reference Quarter shall start on (and shall include) the third Wednesday of December 2021 (December 15, 2021) and shall end on (and shall not include) the third Wednesday of March 2022 (March 16, 2022).

2. Definition of Final Settlement Price

For a contract for a given delivery month, the Final Settlement Price shall be 100 minus compounded daily SONIA during the contract Reference Quarter ("R"), as follows:

Final Settlement Price = 100 minus R

where

R	=	$[\ \Pi_{i=1 \ldots n} \{1+(di/365)*(ri/100)\} - 1\ ] \times (365/D) \times 100$
n	=	the number of weekdays that are not UK bank holidays ("UK banking days") during such Reference Quarter.
i		is the running variable that indexes each UK banking day in such Reference Quarter, such that i takes the values $i = 1,2,\ldots,(n\text{-}1),n$.
$\Pi_{i=1\ldots n}$		denotes the product of values indexed by the running variable, $i = 1,2,\ldots,n$.
r_i	=	the SONIA value corresponding to UK banking day *i*, expressed as an interest rate per annum.
		Example: If SONIA for UK banking day *i* is two and one quarter percent per annum, then $r_i = 2.25$.
d_i	=	the number of calendar days to which r_i applies. For any calendar day that is not a UK banking day (*eg*, weekend days, UK bank holidays), the applicable value shall be SONIA for the first preceding UK banking day.
		Examples: If the i^{th} day is a Monday, a Tuesday, a Wednesday, or a Thursday, and if the next following calendar day is a UK banking day, then $d_i = 1$. If the i^{th} day is a Friday, and if the next following Monday is a UK banking day, then $d_i = 3$.
D	=	the number of calendar days in the Reference Quarter: $D = \Sigma_{i=1\ldots n}\, d_i$.

3. Computational Conventions

The final settlement price for an expiring contract shall be calculated by the Exchange on the day on which the BOE publishes the SONIA value for the last day of such contract's Reference Quarter (Rule 47003.A.1.). Customarily, though not always, such publication will occur on the third Wednesday of such contract's delivery month.

The SONIA value for the last day of such expiring contract's Reference Quarter shall be as first published by the BOE.

The value of R determined pursuant to Rule 47003.A.2. shall be rounded to the nearest 1/10,000th of one percent per annum, *ie*, the nearest 1/100th of one interest rate basis point per annum, or 0.0001 Index points. A tie value, *ie*, any such value ending in 0.00005, shall be rounded up.

> ***Example:*** A value of 3.14155 percent per annum would be rounded up to 3.1416 percent per annum, and then subtracted from 100.000 to determine a contract final settlement price of 96.8584 Index points.

47003.B. Final Settlement

Clearing members holding open positions in a contract at the time of termination of trading in such contract shall make payment to or receive payment from the Clearing House in accordance with normal variation performance bond procedures based on a settlement price equal to the final settlement price.

47004.-35. [RESERVED]

(End Chapter 470)

INTERPRETATIONS AND SPECIAL NOTICES RELATING TO CHAPTER 470

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Appendix C
CME Rulebook Chapter 471 — MPC SONIA Futures

47100. SCOPE OF CHAPTER

This chapter is limited in application to MPC SONIA futures ("futures" or "contract"). In addition to this chapter, futures shall be subject to the general rules and regulations of the Exchange insofar as applicable.

Unless otherwise specified, times referenced herein shall indicate Chicago time.

47101. CONTRACT SPECIFICATIONS

Each contract is valued at £2,500 times the contract-grade IMM Index (Rule 47102.C.).

47102. TRADING SPECIFICATIONS

47102.A. Trading Schedule

Contracts shall be scheduled for trading during such hours and for delivery in such months as may be determined by the Exchange.

47102.B. Trading Unit

For a contract for a given delivery month, the unit of trading shall be compounded daily Sterling Overnight Index Average ("SONIA") interest during the contract Reference Interval (Rule 47103.A.1.), expressed as an interest rate per annum for which (i) such interest rate shall accrue on the basis of the actual number of days spanned by such contract Reference Interval, divided by a 365-day year, and (ii) each basis point per annum of such interest rate shall be worth £25 per futures contract. SONIA shall be as published by the Bank of England ("BOE").

47102.C. Price Basis and Minimum Price Increments

For a contract for a given delivery month, prices shall be quoted and made in terms of the contract IMM Index ("Index"), 100.0000 minus compounded daily SONIA interest during the contract Reference Interval, as specified in Rule 47102.B.

> ***Example:*** Where the value of such compounded daily SONIA is 2.055 percent per annum, it shall be quoted as an Index value of 97.9450.

The minimum price fluctuation shall be 0.005 Index points, equal to £12.50 per contract, provided that for any contract the minimum price fluctuation shall be 0.0025 Index points, equal to £6.25 per contract, as of either (i) the Monday first preceding the date on which such contract's Reference Interval commences, if such Monday is a Business Day, or (ii) the Business Day next following such Monday, if such Monday is not a Business Day.

47102.D. Position Limits, Exemptions, Position Accountability and Reportable Levels

The applicable position limits and/or accountability levels, in addition to the reportable levels, are set forth in the Position Limit, Position Accountability and Reportable Level Table in the Interpretations & Special Notices Section of Chapter 5.

A Person seeking an exemption from position limits for bona fide commercial purposes shall apply to the Market Regulation Department on forms provided by the Exchange, and the Market Regulation Department may grant qualified exemptions in its sole discretion.

Refer to Rule 559 for requirements concerning the aggregation of positions and allowable exemptions from the specified position limits.

47102.E. Special Price Fluctuation Limits

At the commencement of each trading day, the contract shall be subject to special price fluctuation limits as set forth in Rule 589 and in the Special Price Fluctuation Limits Table in the Interpretations & Special Notices Section of Chapter 5.

47102.F. [Reserved]

47102.G. Termination of Trading

Trading in an expiring contract shall terminate at 9:00 a.m. London time on the scheduled BOE Monetary Policy Committee (“MPC”) announcement date by reference to which the end of such expiring contract’s Reference Interval has been defined (Rule 47103.A.1.). If such scheduled MPC announcement date is a UK bank holiday, then trading in such expiring contract shall terminate at 9:00 a.m. London time on the next following weekday that is not a UK bank holiday (“UK banking day”).

47102.H. [Reserved]

47103. SETTLEMENT PROCEDURES

Delivery shall be by cash settlement.

47103.A. Final Settlement Price

1. Definition of Reference Interval

For a given contract, the Reference Interval shall be the interval that ends on (and does not include) the MPC announcement date by reference to which the Exchange defines the end of such expiring contract’s Reference Interval, and that begins on (and includes) the first preceding scheduled MPC announcement date.

> *Example:* For a hypothetical contract for which the delivery month is May 2018, the Exchange defines the contract Reference Interval so as to end on (and not to include) the MPC announcement date scheduled to occur on Thursday, May 10, 2018, and to start on (and to include) the first preceding MPC announcement date, which is scheduled to occur on Thursday, March 22, 2018.

For a given contract, the corresponding Reference Interval shall be determined solely by the Exchange on the basis of such scheduled MPC announcement dates as the BOE has published prior to the date on which such contract is listed for trading by the Exchange. The Reference Interval dates for such contract, so determined, shall remain fixed after such contract has been listed for trading by the Exchange, irrespective of such revisions to the schedule of MPC announcement dates as the BOE may publish subsequently.

2. Definition of Final Settlement Price

For a contract for a given delivery month, the Final Settlement Price shall be 100 minus compounded daily SONIA during the contract Reference Interval ("R"), as follows:

Final Settlement Price = 100 minus R

where

R	=	$[\ \Pi_{i=1\ldots n}\ \{1+(d_i/365)*(r_i/100)\} - 1\ ] \times (365/D) \times 100$
n	=	the number of UK banking days during the Reference Interval
i		is the running variable that indexes each UK banking day in such Reference Interval,such that i takes the values *i = 1,2,…,(n-1),n*.
$\Pi_{i=1\ldots n}$		denotes the product of values indexed by the running variable, $i = 1,2,\ldots,n$.
r_i	=	the SONIA value corresponding to UK banking day *i*, expressed as an interest rate per annum. *Example:* If SONIA for UK banking day *i* is two and one quarter percent per annum, then $r_i = 2.25$.
d_i	=	the number of calendar days to which r_i applies. For any calendar day that is not a UK banking day (eg, weekend days, UK bank holidays), the applicable value shall be SONIA for the first preceding UK banking day. *Examples:* If the i^{th} day is a Monday, a Tuesday, a Wednesday, or a Thursday, and if the next following calendar day is a UK banking day, then $d_i = 1$. If the i^{th} day is a Friday, and if the next following Monday is a UK banking day, then $d_i = 3$.
D	=	the number of calendar days in the Reference Quarter: $D = \Sigma_{i=1\ldots n}\ d_i$.

3. Computational Conventions

The final settlement price for an expiring contract shall be calculated by the Exchange on the day on which the BOE publishes the SONIA value for the last day of such contract's Reference Interval (Rule 47103.A.1.). Customarily, though not always, such publication will occur on the scheduled MPC announcement date by reference to which the end of such expiring contract's Reference Interval is defined.

The SONIA value for the last day of such expiring contract's Reference Interval shall be as first published by the BOE.

The value of R determined pursuant to Rule 47103.A.2. shall be rounded to the nearest 1/10,000th of one percent per annum, ie, the nearest 1/100th of one interest rate basis point per annum, or 0.0001 Index points. A tie value, ie, any such value ending in 0.00005, shall be rounded up.

> ***Example:*** A value of 3.14155 percent per annum would be rounded up to 3.1416 percent per annum, and then subtracted from 100.000 to determine a contract final settlement price of 96.8584 Index points.

47103.B. Final Settlement

Clearing members holding open positions in a contract at the time of termination of trading in such contract shall make payment to or receive payment from the Clearing House in accordance with normal variation performance bond procedures based on a settlement price equal to the final settlement price.

47104.-35. [RESERVED]

(End Chapter 471)

INTERPRETATIONS AND SPECIAL NOTICES RELATING TO CHAPTER 471

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PM2552/1018