THE ULTIMATE GUIDE TO CALCULATING COMPOUNDED SONIA

About This Paper

This paper is based on the April 2020 Bank of England consultation on Compounded SONIA. The Bank has recognised that calculating a daily compounded interest rate such as SONIA from the raw data will be daunting for some and therefore from August 2020 plans to make life easier by publishing a SONIA Compounded Index each day. The new Compounded SONIA Index will simplify the calculation of any SONIA linked loan interest rate by reducing the calculation to a one-stage formula that has much greater familiarity than daily compound interest.

This paper simply looks at how Compounded SONIA Index will work in practise.

Alongside this paper we have created a SONIA Glossary to help understand the new jargon. The rest of this paper gives worked examples of how this new index is intended to work.

Worked Example 1

A SONIA Loan for £10,000,000, that is drawn down on 15 January 2019 and repaid on 15 January 2020, has a Loan Term of 12 months. It was agreed, between the parties, that the Loan Term is divided into four, three month Interest Periods with Interest calculated with reference to SONIA and payable on the last day of each Interest Period.

Compounded SONIA for any Interest Period is calculated in arrears based on a "Reference Period." Each Reference Period will always have the same number of days as the corresponding Interest Period. However, the Reference Period End Date will fall 'n' days earlier than the Interest Period End Date to allow a short period, the "Lag,"[1] to calculate and pay interest. This Lag allows sufficient time for (i) the lender to calculate Compounded SONIA for the Reference Period and inform the borrower, and (ii) for the borrower to pay interest on the Interest Period End Date.

In the example below, the Lag ('n') is 5 London Banking Days; therefore the first Reference Period Start Date is 8 January 2019 and the Reference Period End Dates are 8 April 2019, 8 July 2019, 8 October 2019 and 8 January 2020.

Worked Example 2 – Accrued Interest[2] on 31 March

This is based on exactly the same first Reference Period. In Worked Example 1, the first Interest Period bridges the Financial Year End 31 March 2019 and so has accrued interest at the year end. Therefore Worked Example 2 shows how accrued interest can be calculated from the SONIA Compounded Index in a consistent manner. The following method has been used:

- The Reference Period Start Date is the same as in Worked Example 1, i.e. 5 London Business Days prior to the Interest Period Start Date; and

- The Interest Period day count is 76 days to the end of the financial year (i.e. for year-end accrued interest, the Reference Period End Date is 1 April 2019).

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[1] NOTE - ISDA consulted on "backward shift" instead of "Lag" in its October 2019 consultation. In this paper we have followed the Bank's jargon as the primary source although clearly this may evolve with usage. Furthermore, the Bank refers to 5 days of Lag whereas the majority of respondents to ISDA's consultation favoured 2 days of backward shift. Therefore we should also expect that the convention for the number of Lag days to evolve. This difference would affect the results but wouldn't otherwise affect the principles set out in this paper.

[2] **NOTE – accrued interest periods that start or end on a weekend or bank holiday need to be adjusted because the Index is only published for London Banking Days.**

Worked Example 1 – Interest Payable at the end of the first 3 month Interest Period

- Amount   (£10,000,000)
- Interest Period Start Date -15/01/19   (Drawdown Date)
- Interest Period End Date – 15/04/19   (the date interest is paid)
- Reference Period Start Date – 08/01/19   (SONIA Compounded Index = 1.0043204418)
- Reference Period End Date – 08/04/19   (SONIA Compounded Index = 1.0060693360)
- Interest Period   (90 days)
- Lag   (5 London Banking Days)
- Trim %   (SONIA convention is 4 decimal places)
- Margin[3]   (y%)
- Adjustment Spread[4]   (z%)

$$Compounded\ SONIA\ Rate = \left(\left(\frac{1.0060693360}{1.0043204418}\right) - 1\right) * \frac{365}{90} = 0.7062\% + y\% + z\%$$

$$£10,000,000 * \frac{90}{365} * 0.7062\% = £17,413.15\ (\underline{Payable}\ on\ 15/04/19) + y\% + z\%$$

Worked Example 2 – Accrued Interest at 31 March 2019

- Amount   (£10,000,000)
- Interest Period Start Date -15/01/19   (Drawdown Date)
- Interest Period End Date – 01/04/19   (the accrued interest date)
- Reference Period Start Date – 08/01/19   (SONIA Compounded Index = 1.0043204418)
- Reference Period End Date – 25/03/19   (SONIA Compounded Index = 1.0057971023)
- Interest Period   (76 days)
- Lag   (5 London Banking Days)
- Trim %   (SONIA convention is 4 decimal places)
- Margin   (y%)
- Adjustment Spread   (z%)

$$Compounded\ SONIA\ Rate = \left(\left(\frac{1.0057971023}{1.0043204418}\right) - 1\right) * \frac{365}{76} = 0.7061\% + y\% + z\%$$

$$£10,000,000 * \frac{76}{365} * 0.7061\% = £14,702.36\ (\underline{Accrued}\ on\ 31/03/19) + y\%\ Margin$$

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[3] The margin cannot be compounded otherwise it would produce result depending on the underlying SONIA rate.
[4] Likewise the Adjustment Spread is never compounded.