Discussion Paper: Conventions for referencing SONIA in new contracts

The Working Group on Sterling Risk-Free Reference Rates

March 2019

Contents

Foreword

The overall objective of the Working Group on Sterling Risk-Free Reference Rates (the 'Working Group') is to enable a broad-based transition to SONIA by the end of 2021 across the sterling bond, loan and derivative markets. This will reduce the financial stability risks arising from widespread reliance on sterling LIBOR.[1] This discussion paper is addressed to market participants who are considering how to reference SONIA in new contracts. It is intended to raise market awareness of the identified conventions for referencing SONIA, and, in doing so, delivers the Working Group's key milestone of highlighting how to reference SONIA in new contracts.

Greater awareness of market conventions like those mentioned in this discussion paper could encourage the further adoption of SONIA by a broad range of market participants and help reduce the risks of fragmented liquidity. It is also intended that this discussion paper will support infrastructure providers and calculation agents in developing the necessary changes to enable end-users to reference SONIA. The Working Group has convened an Infrastructure Sub-Group to help identify and catalyse the necessary technology, operations and systems developments to enable adoption. Consideration of the conventions outlined in this discussion paper forms part of their objectives.[2]

Whilst this discussion paper does not capture all conventions for using SONIA in relevant markets, it discusses those which the Working Group considers to be most significant and where providing more information would be beneficial to the market. It is intended to support preparations being made by market participants to reference SONIA directly so does not discuss referencing Term SONIA Reference Rates (TSRRs) in new contracts. The Working Group consulted on forward-looking TSRRs and published a follow up statement on the development of such rates.[3] The Working Group notes its previous statement on TSRRs that it encourages LIBOR users "to progress their transition from LIBOR to the greatest extent possible, independently of any further progress on the development of a TSRR".

This discussion paper was considered at the meeting of the Working Group on 7 February 2019 where it was agreed to be published. The Working Group is particularly grateful to the Bond Market Sub-Group and the Syndicated Loan Market Sub-Group (together, the 'Sub-Groups'), chaired by Paul Richards of ICMA and Clare Dawson of the LMA, respectively, for having developed this discussion paper.

[1] https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/rfr-terms-of-reference.pdf

[2] The Working Group has published a preliminary infrastructure priority list: https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/infrastructure-and-systems-preliminary-priority-list.pdf.

[3] https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/libor-transition-and-development-of-a-term-rate-based-on-sonia.pdf.

Introduction

1. Market conventions can typically develop and change over time according to market-based evolution and/or changes in practice. In order to meet the objectives of the Working Group to facilitate a smooth transition from LIBOR to alternative risk-free rates, in a comparatively short timeframe, the Working Group believes that clarity in relation to existing and emerging conventions can help to:
    a. avoid fragmentation of liquidity across markets;
    b. minimise unnecessary mismatches between products; and,
    c. allow system changes to be applied consistently across markets and products.
2. Throughout 2018, the Sub-Groups identified and analysed conventions to help inform the development of a market for cash products referencing SONIA. Both Sub-Groups used existing precedents as a starting point, including the well-established SONIA swap market and the only previous SONIA-referencing bond issue from 2010.[4]
3. The purpose of this discussion paper is to raise awareness of the identified conventions for referencing SONIA. As a discussion paper, the Working Group has set out questions to invite potential feedback to support its specific work programmes. It is aimed at all market participants and infrastructure providers considering how to reference and to support preparations for new SONIA based products going forward.
4. This discussion paper is intended to complement the development of conventions in the market. It does not present/discuss an exhaustive list of all possible conventions for referencing SONIA. It does not provide guidance or recommendations, given that market conventions are expected to evolve and can differ for the same type of product according to end-user preference. Market participants remain free to choose their preferred conventions.
5. The discussion paper has been divided into three parts:
    a. Section 1 is a summary of conventions that already exist in SONIA-referencing markets.
    b. Section 2 outlines considerations for new products referencing SONIA.
    c. Section 3 sets out questions for suggested feedback from market participants.

[4] https://www.bourse.lu/security/XS0496143149/160677

Section 1: Existing conventions for SONIA based products and differences with LIBOR conventions

Key differences between SONIA and LIBOR benchmarks[5]

6. LIBOR is administered by ICE Benchmark Administration Limited and provides an indication of the average rates at which LIBOR panel banks could obtain wholesale, unsecured funding for set periods in particular currencies. LIBOR is produced for various tenors– overnight, one week, one month, two months, three months, six months and one year. However, the underlying market LIBOR measures is no longer liquid and its future sustainability beyond 2021 is in doubt.

7. At each tenor, LIBOR acts as a forward-looking rate whereby the interest due at the end of an interest period is known at the beginning of that interest period. Interest periods typically match the tenor of the LIBOR rate chosen – i.e. the 3 month LIBOR rate is used for a 3 month interest period.

8. SONIA is administered by the Bank of England and is calculated based on the rates paid on eligible overnight unsecured deposit transactions, as reported to the Bank of England's Sterling Money Market daily data collection. It is produced on a T+1 basis, with the SONIA rate for a given day being published the following day. SONIA is only available for overnight tenors. Unlike LIBOR, SONIA is robust as it is anchored in an active and liquid underlying market.

9. As will be addressed below, the overnight SONIA rates have so far been aggregated or averaged in some way to derive term interest payable (i.e. longer than overnight) for use in those cash instruments such as bonds which have referenced SONIA. This is typically achieved through compounding the rates for a given period to match the interest period. As such, the realised interest rate is only known at the end of the interest period. However, it is worth noting that SONIA tracks the Bank of England's Bank Rate very closely (see figure 1) and that the compounded rate is comparatively stable (see figure 2). As such, the compounded rate for a given period is likely to be comparatively predictable.

Figure 1: SONIA vs Bank Rate

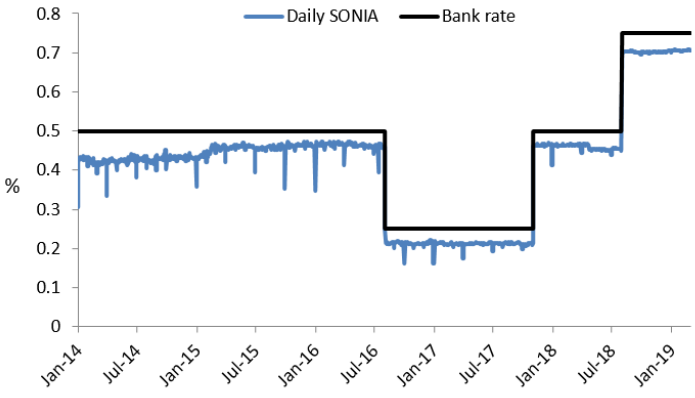
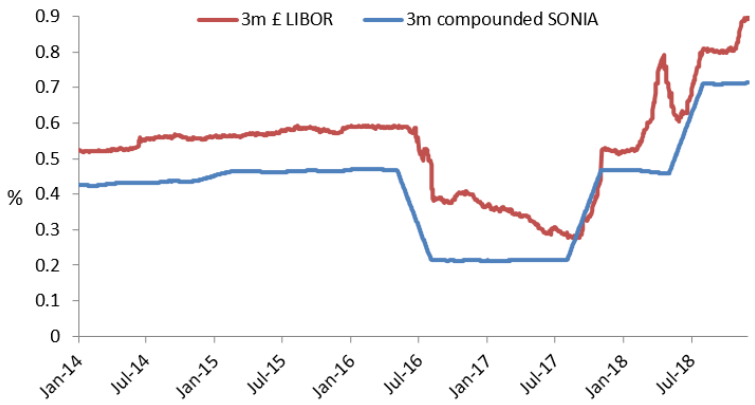


Figure 2: 3m compounded SONIA vs 3m £ LIBOR



Source: Bank of England website, Bank of England calculations, and Bloomberg data.

[5] For more general information on the difference between SONIA and LIBOR, see the following document: https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/what-you-need-to-know-about-libor-transition.pdf?la=en&hash=C1AF77CC308280CF84794D152005A3635546A850.

Conventions in well-established SONIA referencing markets

10. SONIA is used as the underlying reference rate in sterling denominated overnight indexed swaps (OIS). An OIS is a derivative contract in which a fixed rate cash flow is exchanged for a floating rate cash flow indexed to an overnight interest rate. OIS curves are also now widely used as a risk-free discount curve for valuation. OIS markets exist in several currencies and are available for clearing. Most OIS are transacted pursuant to ISDA Master Agreements, using the 2006 ISDA definitions.

11. In order to calculate the floating rate on an OIS, the overnight index (such as SONIA) is typically compounded using the following formula which can be found in the ISDA definitions[6]:

$$\left[\prod_{i=1}^{d_o}\left(1+\frac{\text{SONIA}_i \times n_i}{365}\right)-1\right]\times\frac{365}{d}$$

Where:

"d_o", for any Calculation Period, is the number of London Banking Days in the relevant Calculation Period;

"i" is a series of whole numbers from one to d_o, each representing the relevant London Banking Days in chronological order from, and including, the first London Banking Day in the relevant Calculation Period;

"SONIA_i", for any day "i" in the relevant Calculation Period, is a reference rate equal to the daily Sterling Overnight Index Average (SONIA) rate as provided by the administrator of SONIA to, and published by, authorized distributors of the rate as of 9:00 a.m., London time, on the London Banking Day immediately following that day "i";

"n_i" is the number of calendar days in the relevant Calculation Period on which the rate is SONIA_i; and

"d" is the number of calendar days in the relevant Calculation Period.

12. Compounded rates are also used to derive the floating rate cash flow in SONIA futures and bond contracts. Whilst the futures contracts are comparable to OIS in terms of their SONIA-referencing conventions, there are some differences in the developing SONIA-referencing bond market:

    a. Bonds typically make use of a 'lag' mechanism, in which the interest observation period lags the SONIA rate reference period by 5 London banking days.[7] This means that the

[6] Reproduced with permission of ISDA. Copyright ISDA 2019: https://www.isda.org/a/EHmEE/Supplement-number-55-to-the-2006-ISDA-Definitions.pdf

final interest payment is known 5 days before it is due to be paid. This mechanism provides market participants with greater certainty of cash flows ahead of interest payment dates than the conventions used in OIS and futures contracts.[8]

b. Cash products will typically include a margin above the SONIA benchmark. Rather than being part of the compounding calculation, the (uncompounded) margin has been added to the compounded SONIA rate in recent SONIA-referencing bonds.

[7] This is not prescriptive, and in order to facilitate flexibility with this timing should it be required, some debt issuance programme documentation does not specify a certain number of days, allowing the parties to agree the relevant timing on a deal-by-deal basis.

[8] Additionally, while the ISDA definitions provide parameters in OIS markets for the rounding of compounded SONIA to 5 decimal places (Article 8 of the 2006 ISDA definitions), there needs to be greater consistency on the rounding convention for bond markets to facilitate improved matching/reconciliation of SONIA-referencing bonds.

Section 2: Considerations for new products referencing SONIA

13. The use of SONIA in financial market instruments is quickly increasing across different asset classes, but there remain segments where many market participants have yet to begin using SONIA, for example in the loan market. This section discusses considerations for market conventions relevant to all market participants interested in developing new SONIA based products.

Compounding vs simple averaging

14. As term interest is typically payable at terms greater than overnight (i.e. monthly, quarterly), the daily SONIA rate must be aggregated by market participants to determine the interest amount. The usual means to aggregate is by compounding of the daily rates. But market participants could choose to apply a simple arithmetic average with rollover[9] ('simple averaging') of the applicable daily rates instead. The Working Group has summarised below some noteworthy benefits from using either option.

15. For compounding:

    a. There will be economic equivalence between the compounded rate of interest and the interest applicable for a deposit that is held daily for the same period. The compounded rate of interest more accurately reflects the time value of money than a simple average.

    b. Use of a compounded rate aligns with the established market practice for SONIA-referencing derivatives, including the OIS market. This may be preferable for hedging purposes.

    c. The prevalent use of compounded rates in SONIA-referencing markets and other financial markets points to a certain degree of familiarity and existing infrastructure for this calculation to continue to be used.

    d. Using compounding may reduce the risk of liquidity fragmentation, given that simple averaging is not typically used in any SONIA-referencing products at present.

16. For simple averaging:

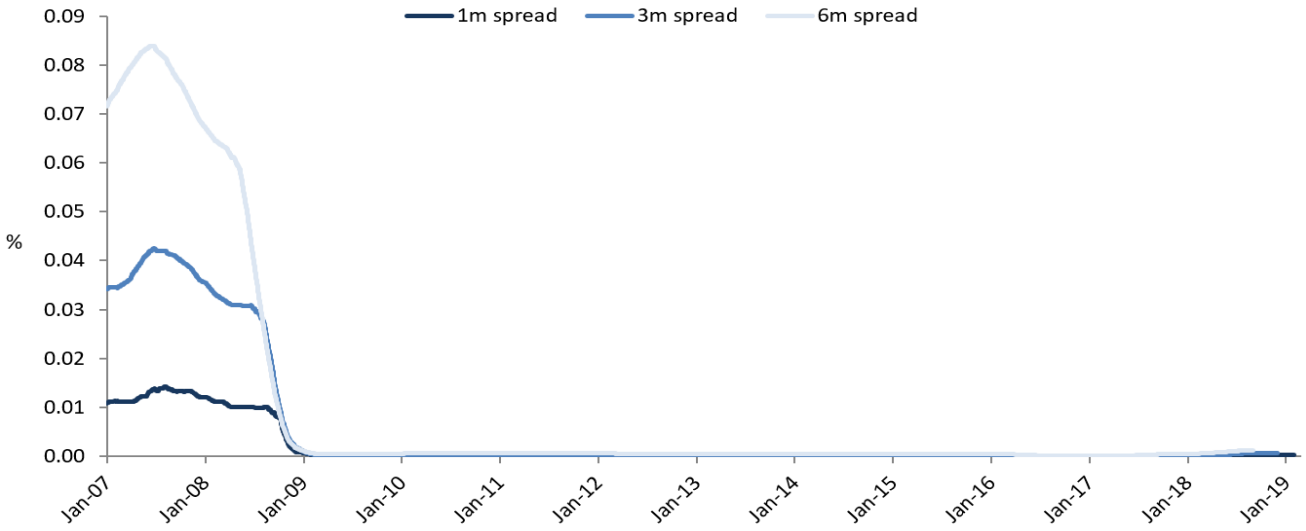
    a. As the formula is less complex when compared to compounding, it may be easier to include in interest calculation systems.

    b. Whilst at present the method is not typically in use for SONIA-referencing products, it has been used in risk-free referencing products in other currencies (such as US Dollar FRNs).

17. However, market participants should be aware that the compounding method and the simple averaging method will not generate the same result. As shown in figure 3, whilst the spread between the two has been very narrow since 2009, it has been wider during higher and more volatile interest rate environments historically. This effect is more pronounced at longer terms – the 6m simple average vs compounded spread reached a peak above 8bps in 2007 at the height of the last interest rate rising cycle.

[9] Where the Friday rate is rolled over for Saturday and Sunday when performing the simple arithmetic average over 7 days.

Figure 3: Spreads between compounded and simple average SONIA



Source: Bank of England website, Bank of England calculations, and Bloomberg data.

Manual calculation vs use of a calculator/screen rate

18. The Working Group noted from discussions within its Sub-Groups that it would be helpful for market participants if a third party published a standard SONIA rate calculator or a SONIA screen rate for a given period[10]. This suggestion could be implemented for each of the compounding and simple averaging methods. It would:

    a. Expedite processes by enabling market participants to take the applicable compounded or simple averaged rate from the screen or calculator.

    b. Assist with interest calculations involving non-business days and national holidays.

    c. Provide third party validation to calculations of interest payable.

19. The use of a SONIA calculator/screen rate is included in the Working Group's priority list for potential infrastructure development.[11] A more detailed specification note for third parties to consider in potentially developing a SONIA calculator/screen rate has also been published.[12]

Margin treatment

20. As mentioned in section 1, there are options for applying a margin to a SONIA-referencing product. With both the compounding method and the simple averaging method, the margin could be included as part of the daily rate calculation or it could be added to the already calculated rate.

21. For compounding, the Working Group noted the following:

[10] Although noting the possibility for human error with the use of a calculator-based rate.

[11] https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/infrastructure-and-systems-preliminary-priority-list.pdf.

[12] https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/infrastructure-sub-group-calculator-specifications.pdf?la=en&hash=621A8AC51158BB9B3A195C4DB62A10C5305B2C3B.

a. Daily compounding of the margin would lead to changes to the prevailing level of margin for the product based on movements in daily SONIA rates. For example an increase / decrease of 1bp in daily SONIA would have a greater than 1bp increase / decrease impact for the overall rate. This effect could create economic incentives for interest periods to be either shorter or longer than currently in certain segments of the market.

b. It would be easier to benchmark and compare transactions if the SONIA rate plus the additional margin were kept separate.

c. Margin compounding is likely to introduce additional complexity to the interest payment calculation and might give rise to variations in interest calculation. It may also not be compatible with use of a standard calculator tool or screen rate, were one to become widely accepted.

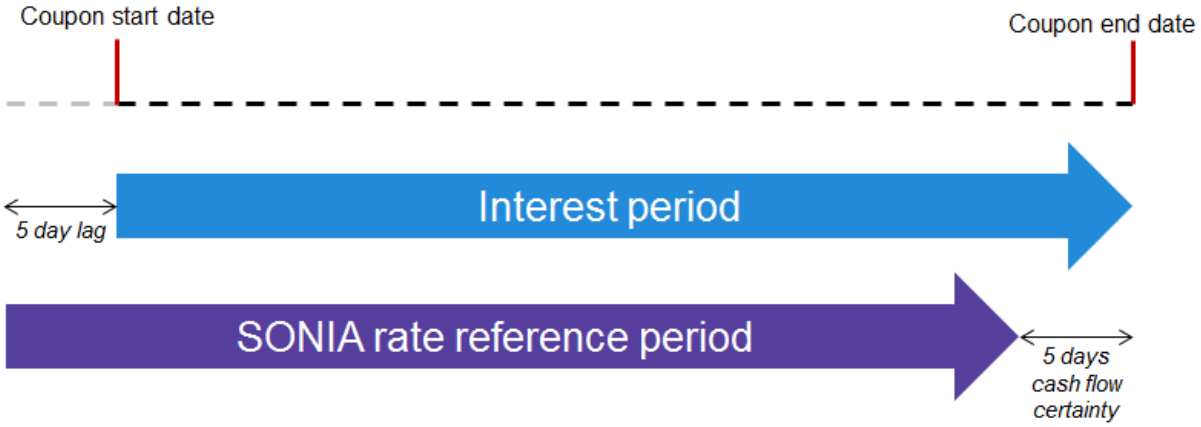
d. Compounding the margin could lead to misalignment between the underlying SONIA product (i.e. a SONIA-referencing bond) and its associated hedge, as SONIA derivatives do not compound the margin.

e. All recent SONIA-referencing bonds have added the margin after the compounding calculation, which suggests that there is a degree of comfort with this approach.[13]

Lag mechanism vs lock out mechanism

22. As previously noted in this discussion paper, there are different ways by which market participants using SONIA-referencing products can achieve some degree of cash flow certainty before an interest payment is due. One approach is to 'lag' the SONIA rate reference period by 5 London banking days in order to establish 5 days of cash flow certainty (figure 4).[14]

Figure 4: Illustration of floating rate note lag mechanism



[13] Though it is worth noting a previous EIB SONIA bond issuance in which the spread was included in the margin calculation: https://www.bourse.lu/security/XS0496143149/160677.

[14] Currently, the labelling of this approach may vary and also be referred to as a 'look back' or 'reset days prior'.

23. An alternative approach would be the 'lock out' mechanism, which repeats one of the daily rates for the final few days of the calculation. The Working Group has considered the following with regards to both of these approaches:

    a. A lag mechanism provides certainty for a given number of days at any point in the interest period whereas a lock out mechanism would only do so at the end. Market participants may find a lag helpful in circumstances where there is a need to calculate interest accruing during an interest period, for example primary and secondary delayed compensation or prepayment.

    b. From a systems perspective, market participants may find it easier to adopt a lag mechanism than a lock out. Implementation of a lock out would require the additional functionality to lock the rate and then compound/average it.

    c. A lag mechanism avoids the risk of locking the rate on a date where the rate is unusually high/low (for example, at quarter and year ends) leading to disproportionate changes in the compounded/average rate.

    d. All recent new issuances of SONIA-referencing bonds have adopted the lag approach, so there is a certain degree of familiarity with the concept.

24. It is also worth noting that SONIA swaps with lag or lock out features cannot be centrally cleared at present, though clearing houses have indicated a willingness to offer this if there is a demand over time.

Number of days for lag or lock out

25. There are both advantages and disadvantages to having a longer or shorter period for the lag and lock out mechanisms. Generally, it would be desirable for market participants to have a choice of how many days of cash flow certainty they require. The following considerations are likely to be important in this regard:

    a. Increasing the number of days gives a greater degree of cash flow certainty for end-users. This may be required in certain instances, for example when tax obligations need to be calculated.

    b. Decreasing the number of days gives greater alignment with the general level of interest rates. This will vary for different interest periods.

    c. For shorter interest periods, such as 1 month, lag/lock out periods of 5 days or longer could be seen as more problematic given the lag/lock out would represent a greater proportion of the interest period.

    d. Excessively long lag/lock out periods could impact on hedge effectiveness if the end-user were to use a standard OIS for hedging purposes (i.e. no lag or lock out).

    e. Significantly long lags/lock out periods may lead to accounting challenges. For example, IFRS9 includes the sole payment of principal and interest (SPPI) test where a financial instrument to be held at amortised cost is required to have cash flows that solely relate to principal and interest payments for a given period. If the interest payable differs significantly from the general level of interest rates for the period, this may affect whether the SPPI test is met.

26. Market participants will likely want to consider their own cash flow certainty needs in determining an appropriate length of lag or lock out. Therefore, it may be beneficial for documentation and infrastructure supporting any lag/lock out to have sufficient flexibility to incorporate different options.

Fallbacks for SONIA

27. Market participants need to ensure they have robust contractual fallbacks for SONIA under the EU Benchmarks Regulation (BMR), and in line with the IOSCO Statement on Matters to Consider in the Use of Financial Benchmarks.[15] The BMR requires that supervised users of all benchmarks must produce and maintain robust written plans setting out their planned course of action in the event of cessation or material change of a benchmark. This applies irrespective of the degree of flexibility in the benchmark's methodology.

28. The Bank of England, as administrator of SONIA, has contingency arrangements in place to enable continued SONIA publication. In the event of short-term disruption, SONIA will be determined as the level of Bank Rate plus the trimmed mean of the SONIA-Bank Rate margin over the previous 5 publication days. The following is noteworthy in this regard:

    a. The Bank of England has defined SONIA in such a way as to allow it to evolve in response to changing market structure while providing contract continuity.

    b. Were such an evolution ever to be required, it would be subject to consultation to the extent possible.[16] The ability to evolve SONIA was one of the Working Group's reasons for recommending SONIA as the preferred RFR[17] and should reassure users that it will remain viable over the long-term.

29. These contingency mechanisms only apply to the overnight SONIA rate provided by the Bank of England (rather than any derived screen rate).

30. Some bond issuers have replicated these mechanisms in their fallback contractual language. Written plans and fallback arrangements should be proportionate, and the flexibility and responsiveness of the methodology may be one relevant consideration. Market participants will have to consider their own needs to determine appropriate fallback contractual language.

Alignment with well-established SONIA-referencing markets

31. It had not been previously possible to clear OIS with a payment frequency greater than annual. In Q4 2018, LCH added this capability meaning cleared OIS will have greater alignment with products in cash markets where interest periods are typically either monthly, quarterly or semi-annual.

32. However, the use of lag or lock out mechanisms is less typical in the OIS market and it is not yet possible to clear swaps with these features. The development of cash market conventions in these areas may help to concentrate demand to which clearing houses can respond. Market

[15] https://www.iosco.org/library/pubdocs/pdf/IOSCOPD589.pdf

[16] For more information please see section 8 of the following link: https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/sonia-key-features-and-policies

[17] https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/sonia-as-the-risk-free-reference-rate-and-approaches-to-adoption.pdf

participants operating across both (a) bond or loan markets and (b) derivatives markets will need to consider the extent to which greater alignment is necessary, including use of bespoke hedging derivatives where necessary. The Working Group's current view is that such variations between the cash market and derivatives market are not excessively problematic at present; particularly given that new features in bond markets could help to support adoption in the loan markets.

Cross-currency considerations

33. The Working Group considers that small differences in conventions between currencies in certain products would not be overly problematic. There are already such differences between currencies: for example, some derivatives and bonds use averaging while others use compounding. However, cross-currency alignment is likely to be more important and reduce complexity for end-users. There is potential for the sterling market to provide some precedents in this regard.

34. In August 2018, the US Alternative Reference Rates Committee formed a subgroup consisting of official and private sector members of national RFR Working Groups to discuss potential specifications that market participants could consider in trading cross-currency basis swaps that reference overnight RFRs. The subgroup is planning to publish and seek feedback on a document proposing options for potential RFR-to-RFR cross-currency swap conventions in the dealer-to-dealer market. Cross-currency coordination in this and other areas is likely to continue to be important going forward as market participants continue to adopt RFRs.

Section 3: Next steps and feedback

35. The Working Group encourages all interested market participants and infrastructure providers to read this discussion paper and use it to support preparations for adopting SONIA in new products.

Question 1: *Does there need to be further explanation of the considerations for conventions for referencing SONIA set out in this discussion paper?*

Question 2: *Given the considerations outlined in Section 2 of this discussion paper, are the conventions being used in the SONIA-referencing bond market (as outlined in paragraph 12 of this discussion paper) suitable for the loan market? Please explain your answer.*

Question 3: *Are there any infrastructure considerations to the conventions outlined in this discussion paper that need to be particularly highlighted? Please explain your answer.*

Question 4: *What more could be done to further encourage market adoption and awareness of the SONIA conventions outlined in this discussion paper?*

Question 5: *Are there any additional considerations or conventions that this discussion paper has not identified which might be relevant to SONIA adoption?*

36. Market participants are welcome to contribute their views on the above questions by 30 April 2019 by contacting the following email address: **RFR.Secretariat@bankofengland.co.uk**. Information provided will be shared on an anonymous basis with the Working Group.