# Report from the Sub-Group on Loans

■ The Sub-Group on Loans reported on the results of its consultation at the seventeenth meeting of the Committee (November 5, 2020) and explained that almost all members of the sub-group preferred the "Lookback without Observation Shift" approach for TONA (Fixing in Arrears)[1] conventions to use in loans. It also reported on its plan to continue examining matters, on which the sub-group could build a consensus between its members, as necessary.

■ Accordingly, the sub-group continued to discuss mainly the "Lookback without Observation Shift" approach and consulted with its members on the following: (1) points regarding the interest calculation methodology based on the approach, (2) points including the interest calculation methodology based on other approaches, and (3) other points.

■ While the sub-group had built a consensus on many points with regard to (1) to (3) above, some respondents expressed the opinion that they deemed it not appropriate to specify a single methodology or approach in some of the points and that it was necessary to take into consideration the compatibility with the current administration and systems. Therefore, the sub-group decided to ask the Committee to publish the results of the consultation in the sub-group, although it would not to request for a recommendation by the Committee, with a view to contributing to market participants developing systems and operations for TONA (Fixing in Arrears) in loans.

< "Lookback without Observation Shift" approach – Example of a lookback period of 5 business days - >

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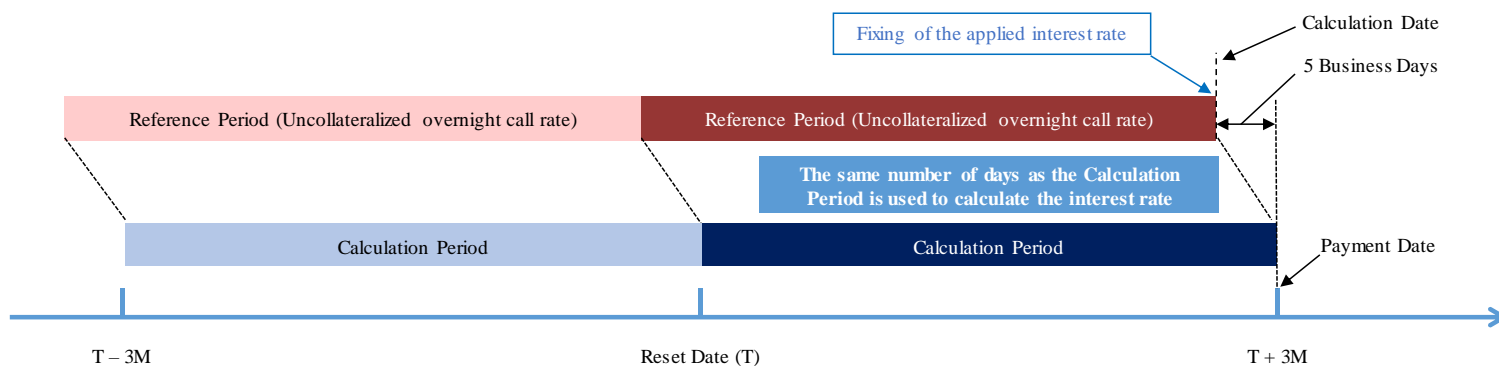
[1] The Committee recommended the waterfall structure for loans using O/N RFR Compounding (Fixing in Arrears) in the second priority. Additionally, the Committee outlined the target deadline for developing systems and operations for O/N RFR Compounding (Fixing in Arrears) by the end of Q1 in 2021 in the "Roadmap to prepare for the discontinuation of LIBOR."

(Tentative translation)

[Results of the Consultation in the Sub-Group on Loans][2]

    (1) Points regarding the interest calculation methodology based on "Lookback without Observation Shift"

Point	Results of the Consultation
Lookback period	・A large majority of respondents agreed with illustrating a lookback period of five business days as an example with a view to maintaining consistency with the discussions in the United Kingdom and the United States[3] and taking into consideration interest payment operations.[4] ・Some respondents added that it would be desirable to keep the lookback period as short as possible with a view to calculating the interest more precisely.
Compound the Rate / Compound the Balance[5]	・Most respondents agreed to illustrate both the "Compound the Rate (ACR/NCR)" method and the "Compound the Balance" method. ・Some respondents that had agreed expressed a view that they preferred the "Compound the Rate" method due to its compatibility with the current systems. ・Respondents who had disagreed pointed out that it would be desirable to specify a single method, instead of illustrating two methods, to proceed with preparations smoothly in terms of administrations and systems, and that it would be difficult to allow different methods to be used by each financial institution.
Rounding	Almost all respondents agreed with rounding the calculated interest rate to five decimal points (when displayed in percentage) with a view to maintaining consistency with LIBOR and ISDA derivatives.
Holiday and weekend convention	Almost all respondents agreed with the following. ・Compound Interest: Interest is compounded on business days; the preceding business day's rate is applied over weekends or holidays, weighted by the number of calendar days until the next business day. ・Simple Interest: For all days simple interest based on TONA is used; the preceding business day's rate is applied over weekends or holidays, weighted by the number of calendar days until the next business day. ・In multi-currency contracts, interest can be compounded on business days for the drawn currency and ignore the business/nonbusiness days of other currencies with a view to maintaining consistency with the discussion in the United Kingdom.

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[2] The Sub-Group on Loans shall not preclude contracting parties from selecting different methodologies or approaches from that indicated in this document.

[3] The Working Group on Sterling Risk-Free Reference Rates (RFRWG) in the United Kingdom recommended five business days. The Alternative Reference Rates Committee (ARRC) in the United States illustrated five business days as an example.

[4] Some respondents expressed a view that it would be appropriate to only introduce what other national working groups recommended or examples of what they actually implemented in a situation where there were only a few loan products referencing TONA (Fixing in Arrears) so far.

[5] See Appendix for details.

(Tentative translation)

Point	Results of the Consultation
Business day convention for payments	Almost all respondents agreed with adopting "Modified Following Business Day Convention" with a view to maintaining consistency with discussions in the United Kingdom and the United States.
Day count	All respondents agreed with ACT/365 (fixed) with a view to maintaining consistency with TONA.
Treatment of the first and the last business days in the relevant calculation period	Almost all respondents agreed with the methodology which would include the first business day and not the last business day in the relevant calculation period with a view to maintaining consistency with discussions in the United Kingdom and the United States.

(2) Points including the interest calculation methodology based on other approaches

Point	Results of the Consultation
Approaches other than "Lookback without Observation Shift"	Almost all respondents agreed that contracting parties shall not be precluded from adopting "Observation Period Shift" as it was a viable and robust approach.
Simple interest[6]	Almost all respondents agreed that contracting parties shall not be precluded from adopting "simple interest" (simple average) if they agree to use it in contracts.
Floors	Overall, the respondents did not indicate a strong preference for a specific methodology[7] on this point. Some respondents expressed a view that market participants should be free to decide whether a floor would be applied and at which level. Others also indicated that there was no consensus on the methodology with regard to this point in the global discussions.[8]
Margin treatment	All respondents agreed that margin should be added after the rate compounding (i.e., margin is not compounded) with a view to maintaining consistency with discussions in the United Kingdom and the United States.

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[6] The Committee indicated in the second public consultation paper that the waterfall structure using a simple average of O/N RFR (Fixing in Arrears) in the second priority could be also considered, taking into account the discussion in the ARRC.

[7] For legacy LIBOR contracts containing a floor, if the replacement rate (TONA [Fixing in Arrears] + the credit adjustment spread [CAS]) is less than zero, adjustments such as the following can be carried out based on an agreement between contracting parties: (i) to adjust TONA (Fixing in Arrears) so that the replacement rate would equal to zero, while maintaining the CAS at the same level; (ii) to adjust the CAS so that the replacement rate would equal to zero, while maintaining TONA (Fixing in Arrears) at the same level.

[8] Different methodologies to calculate a floor have been illustrated in different jurisdictions: RFR (before compounded) in the United Kingdom and the United States, "RFR + CAS" in Europe, and RFR (after compounded) in Switzerland.

(Tentative translation)

(3) Other points

Point	Results of the Consultation
Publication of the results	Almost all respondents agreed to publish the results of the consultation in the sub-group and an example of calculation methodology (see Appendix).
Selection of publishing entity for TONA (Fixing in Arrears) calculator[s]	・Most respondents agreed with each contracting party using such calculators[9] as those introduced by the RFRWG as necessary, given that separate publishing entities for TONA (Fixing in Arrears) calculator[s] would not be selected.[10] ・Respondents who had disagreed pointed out that publishing entities for TONA (Fixing in Arrears) should be selected, or at least some calculators should be provided, with a view to enabling contracting parties to confirm the interest rate mutually and objectively.
Glossary	The Japanese Bankers Association planned to create a glossary of terms related to TONA (Fixing in Arrears). All respondents agreed to use the glossary for contracts as necessary.

■ The sub-group would deliberate on any additional issues as necessary, when the number of loan products referencing TONA (Fixing in Arrears) would increase to some extent in Japan.

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[9] The RFRWG provides a summary of freely available calculators. For details, see the following link:
https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/rfr/rfrwg-freely-available-calculator-summary.pdf
[10] Some respondents expressed a view that it would be preferable to publish TONA Index and TONA Average in addition to calculators.

(Tentative translation)

Appendix: Example of Calculation Methodology for TONA (Fixing in Arrears) in Loans

I. Definitions[1]

Notation	Details (used in "Compound the Rate")	Notation	Details (used in "Compound the Balance")
d_b	The number of business days in the calculation period	t	A given business date
i	The i-th business day in chronological order from, and including, the first business day in the relevant calculation period	P_t	Outstanding principal for date t
j	The j-th business day in chronological order from, and including, the first business day in the relevant calculation period	A_t	The accumulated unpaid accrued interest for date t *before* any interest paydown
$TONA_i$	TONA applicable on business day i in the reference period, as published on the business day immediately after business day i	A'_t	The accumulated unpaid accrued interest for date t *after* any interest paydown
n_i	The number of calendar days for which $TONA_i$ applies in the relevant calculation period	PD_t	The amount of any interest paydown for date t
tn_i	Total number of calendar days from business day 1 to business day i+1 in the relevant calculation period		
$\left[\prod_{i=1}^{d_b}\left(1+\frac{TONA_i \times n_i}{365}\right)-1\right]\times\frac{365}{tn_{d_b}}$	Annualized cumulative compounded $TONA_i$ for the relevant calculation period (tn_{d_b} indicates the number of calendar days in the relevant calculation period)	$r_t = \dfrac{TONA_t \times n_t}{365}$	The effective TONA for date t

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[1] For the treatment of the first and the last business days in the relevant calculation period, it is based on the premise that the first day is included and the last day is not included, which is the same treatment as that described in "Report from the Sub-Group on Loans" (p.3), meeting item for the December 25, 2020 meeting.

(Tentative translation)

II. Interest calculation methodology (without taking account of the lookback period)

A. Compound the Rate (Annualized Cumulative Compound Rate [ACR])

➢ "Compound the Rate (ACR)" calculates the compounded rate at the end of the calculation period and it is applied to the whole period. It allows calculation of interest for the whole period using a single compounded rate.

➢ Interest amount is calculated as follows (margin is added after compounding):

【Step 1】 ACR[2]

$$ACR_{d_b} = \left[\prod_{i=1}^{d_b} \left(1 + \frac{TONA_i \times n_i}{365} \right) - 1 \right] \times \frac{365}{tn_{db}}$$

【Step 2】 Interest amount (disregarding fractions of 1 JPY)

$$Interest\ Amount = \frac{Principal \times ACR_{d_b} \times tn_{db}}{365}$$

B. Compound the Rate (Noncumulative Compound Rate [NCR])

➢ "Compound the Rate (NCR)" is derived from "Compound the Rate (ACR)," i.e., Cumulative rate as of current day minus Cumulative rate as of prior business day. This generates a daily compounded rate which allows the calculation of a daily interest amount.

➢ Interest amount is calculated as follows (margin is added after compounding):

【Step 1】 ACR[3]

$$ACR_i = \left[\prod_{j=1}^{i} \left(1 + \frac{TONA_j \times n_j}{365} \right) - 1 \right] \times \frac{365}{tn_i}$$

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[2] It would be an option to round the calculated rate to five decimal points (when displayed in percentage), which is the same treatment as that described in "Report from the Sub-Group on Loans" (p.2), meeting item for the December 25, 2020 meeting.
[3] The same option as Footnote 2 is applicable.

【Step 2】 Unannualized Cumulative Compound Rate (UCR)[4]

$$UCR_i = ACR_i \times \frac{tn_i}{365}$$

【Step 3】 NCR[5]

$$NCR_i = (UCR_i - UCR_{i-1}) \times \frac{365}{n_i}$$

【Step 4】 Interest Amount (disregarding fractions of 1 JPY)

$$Interest\ Amount = \left[\sum_{i=1}^{d_b} \left(\frac{Principal_i \times NCR_i \times n_i}{365} \right) \right]$$

C. Compound the Balance

➢ The rate is multiplied by the outstanding principal and unpaid accrued interest.

➢ Interest is calculated as follows (margin is added after compounding):

$$A_{t+1} - A'_t = r_t \times (P_t + A'_t) \quad \text{(disregarding fractions of 1 JPY)}$$

PD_t is negative number, so that $A'_t = A_t + PD_t$

D. Simple Interest

➢ The rate is sourced daily and multiplied by the outstanding principal.

➢ Interest is calculated as follows (margin is added after compounding):

$$A_{t+1} - A'_t = r_t \times P_t \quad \text{(disregarding fractions of 1 JPY)}$$

PD_t is negative number, so that $A'_t = A_t + PD_t$

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[4] In the worked example provided by the RFRWG, the rate is not rounded in this step.
[5] The same as Footnote 4.