

Calculation of interest on Loans and discounting products using compounded overnight risk-free rates (ON RFRs).

I. Definitions:

1. Start Day of an Interest Period	the first day of an Interest Period, which at the same time is the last day of the immediately preceding Interest Period and the repayment day of interest calculated in the previous Interest Period, unless the commencing Interest Period is the first Interest Period for a Drawing,
2. End Day of an Interest Period	the last day of an Interest Period, which at the same time is the first day of the immediately following Interest Period, unless the ending Interest Period is the last Interest Period for a Drawing,
3. Interest Period	a period in which interest is calculated, i.e. from the Start Day (inclusive) to the End Day (exclusive),
4. ON RFR (overnight risk-free rate)	an overnight interest rate benchmark (ON RFR) published in the Portal, including in particular: SARON for CHF, SONIA for GBP, SOFR for USD, TONA for JPY, and ESTR for EUR, POLSTR for PLN,
5. Fixing Day Calendar	a business day calendar for an overnight rate, i.e. for the country of a currency,
6. ON(t)	the ON RFR applicable on day t (from day t inclusive to the next business day) as per the Fixing Day Calendar; the following are set for an RFR ON(t): <ul style="list-style-type: none"> ■ Applicability Start Day – day t as per the Fixing Day Calendar, ■ Applicability End Day – the business day following t as per the Fixing Day Calendar, ■ Rate Publication Date – the business day following t as per the Fixing Day Calendar where the currency of RFR ON(t) is EUR, USD, GBP, JPY or PLN, and day t as per the Fixing Day Calendar where the currency of RFR ON(t) is CHF. Where the rate was not published by the administrator on the publication date, we assume the rate published on the previous publication date,
7. T Date Lag	as per the Fixing Day Calendar it consists in setting day P(T) corresponding to the business day as per the Fixing Day Calendar preceding day T by the number of business days indicated in the Agreement, counting backwards from day T,
8. Compounded RFR	the Base Rate for Daily Interest Calculation referred to in section II.5, calculated by compounding daily ON RFRs,
9. Compounded Discount RFR	the Base Rate for Discount Interest Calculation referred to in section IV.4, calculated by compounding historical daily ON RFRs,

II. Calculation of compounded RFR used to determine interest payable on Loans

- A compounded RFR is calculated by compounding ON RFRs over an Interest Period.
- We designate the subsequent calendar days of the current Interest Period as T_1, \dots, T_n . Consequently T_1 is the Start Day of the Interest Period and T_n is the End Day of the Interest Period.
- For every day T_i where $i = 1, \dots, (n-1)$ we determine a series of n_i subsequent business days $T_{i+1}^*, \dots, T_{i+n_i}^*$ as per the Fixing Day Calendar, such that $T_{i+1}^* = P(T_i)$ and $T_{i+n_i}^* = P(T_{i+1})$. Then, as at day T_i we determine the Cumulated Base Rate for Compound Interest $CR(T_1^*, T_{n_i}^*)$ from the Start Day of the Interest Period to day T_{i+1} in accordance with the following formula:

$$CR(T_1^*, T_{n_i}^*) = \left[\prod_{k=1}^{n_i-1} \left(1 + ON(T_k^*) \cdot \frac{(T_{k+1}^* - T_k^*)}{B \cdot 100} \right) - 1 \right] \cdot \frac{B \cdot 100}{(T_{n_i}^* - T_1^*)}$$

where:

- B – is the Day Count Fraction applicable to an ON RFR, i.e. 360 for CHF, USD and EUR, and 365 for GBP, JPY or PLN;
- k – is a variable indexing the set of subsequent business days $\{T_1^*, \dots, T_{n_i}^*\}$, which assumes subsequent values from 1 to $(n_i - 1)$.

Base rate $CR(T_1^*, T_{n_i}^*)$ is given in percentage points and rounded to four decimal places for CHF, EUR and GBP, and to five decimal places for USD, JPY and PLN.

If T_1 is a non-business day as per the Fixing Day Calendar, T_1^* is set by shifting it by an additional business day for the purpose of calculating $CR(T_1^*, T_{n_i}^*)$.

- Based on $CR(T_1^*, T_{n_i}^*)$ we determine the Cumulated Base Rate for Compound Interest Calculation (SNO) in the period from T_1 to T_{i+1} in accordance with the formula below:

$$SNO(T_1, T_{i+1}) = CR(T_1^*, T_{n_i}^*) \cdot \frac{(T_{i+1} - T_1)}{B \cdot 100}$$

5. We use it as the basis for calculating the Base Rate for Daily Interest Calculation DR (T_i) as at day T_i (rate at which interest is calculated in the period from T_i to T_{i+1}):

$$DR(T_i) = [SNO(T_i, T_{i+1}) - SNO(T_i, T_i)] \cdot \frac{B * 100}{(T_{i+1} - T_i)}$$

with the proviso that $SNO(T_i, T_i) = 0$.

Base rate DR (T_i) is given in percentage points and rounded to four decimal places for CHF, EUR and GBP, and to five decimal places for USD, JPY and PLN. The value of interest rate DR (T_i) is made available to the Client in mCN on a daily basis in the Interest Period.

III. Calculation of interest on drawn Loans using compounded RFR

1. The Calculated Daily Interest NOD (T_i) for the period from T_i to T_{i+1} is calculated in accordance with the following formula:

$$NOD(T_i) = N \cdot (\max(DR(T_i); 0) + M) \cdot \frac{(T_{i+1} - T_i)}{B * 100}$$

where:

- N – is the Drawing amount in the current Interest Period,
 - M – is the credit margin of the bank in percentage points.
2. The value of the Cumulated Calculated Daily Interest for the period from T_1 to T_{i+1} , that is an amount calculated as follows:

$$\sum_{k=1}^i NOD(T_k)$$

is made available to Clients in the mCN system on a daily basis.

3. Interest due for the entire Interest Period is the sum of the Calculated Daily Interest for the period from T_1 to T_n calculated as follows:

$$\sum_{k=1}^{n-1} NOD(T_k)$$

IV. Calculation of compounded discount RFR used to determine interest payable on discounting products:

1. Interest on discounting products is calculated using ON RFRs determined by compounding interest based on ON rates. Since the Base Rate used to calculate interest on discounting products must be known on the day of releasing the products, we use compounded ON RFRs from a historical period:
- a/ with a duration of the discount period for the Base Rate adjusted to the discount period or
- b/ with a fixed duration set in the Agreement lasting a pre-defined number of calendar days equal to N for the Base Rate with a fixed period. The type of Base Rate is set in the Agreement.
2. Let T_1, \dots, T_n denote subsequent calendar days of a discount period where T_1 is the first day and T_n is the last day of the discount period for which interest is calculated in the discount period. Therefore, the number of calendar days in which discount is calculated is n.
3. For day T_1 we identify the day being the first business day as per the Fixing Day Calendar earlier than T_1 , which at the same time is the ON RFR Publication Date and the day on which the ON RFR is made available in the bank's systems (where the rate is available, we assume the rate published on the previous publication date). T^* is the Applicability End Day of the ON RFR and T_0^* is the calendar day preceding T^* by n calendar days for a rate adjusted to the discount period or preceding T^* by N calendar days for a Base Rate with a fixed period.
4. Then we set day T_1^* which is the first business day (counting from day T_0^*) as per the Fixing Day Calendar not earlier than T_0^* and earlier than T^* . If such a day does not exist, day T_1^* is set as the first business day (counting from day T_0^*) as per the Fixing Day Calendar earlier than T_0^* . Next we determine a series of m subsequent business days T_1^*, \dots, T_m^* as per the Fixing Day Calendar from T_1^* to T_m^* , where $T_m^* = T^*$. Then we calculate the Cumulated Base Rate for Compound Discount Interest $CR_D(T_1, T_n)$ for the discount period using the formula given below:

$$CR_D(T_1, T_n) = \left[\prod_{k=1}^{m-1} \left(1 + ON(T_k^*) \cdot \frac{(T_{k+1}^* - T_k^*)}{B * 100} \right) - 1 \right] \cdot \frac{B * 100}{(T_m^* - T_1^*)}$$

where:

- B – is the Day Count Fraction applicable to an ON RFR, i.e. 360 for CHF, USD and EUR, and 365 for GBP, JPY and PLN;
- k – is the variable assuming values from 1 to (m-1) corresponding to the subsequent historical business days as per the Fixing Day Calendar

The base rate $CR_D(T_1, T_n)$ is given in percentage points and rounded to four decimal places for CHF, EUR and GBP, and to five decimal places for USD, JPY and PLN.