STIBOR Calculation Examples

April 2024

Contents

Disclaimer

Definitions & Acronyms

Tenors	Duration of a product and/or contract
T/N	Tom/Next Tenor
1W	1 Week Tenor
1M	1 Month Tenor
2M	1 Months Tenor
3M	3 Months Tenor
6M	6 Months Tenor
COF	Cost of Funds
Panel Banks	A panel of credit institutions that are representative of the Swedish financial Market
BOS	Bid to Offer Spread that reflects the difference between an estimated borrowing rate and lending rate
Implied SEK Rate	The equivalent rate expressed in Swedish Krona calculated from foreign currency denominated transactions (USD, EUR, and GBP)
Day count	Number of calendar days between the maturity and settlement date
Business day	Swedish business day

1 Introduction

STIBOR is determined with the Input Data contributed by Panel Banks. A Panel Bank's contribution toward STIBOR is based on executed transactions, when available, mathematical techniques and on a combination of other sources of information and when transactional evidence is insufficient.

This document provides the reader with examples of the calculation of STIBOR and should be viewed as a supportive tool suitable for readers who are familiar with the details specified in the Calculation Methodology and the Panel Bank Code of Conduct.

2 Overview of STIBOR's Calculation Methodology

The calculation of a Panel Bank's contribution is divided into two steps:

Step 1 - A measure of the Panel Bank's Cost of Funds (COF) is calculated by means of an Input Data priority waterfall;

Step 2 - A Bid to Offer Spread (BOS) is added to the Panel Bank's cost of funds as determined in step 1.

Hierarchy of Input Data

Panel Bank's contribution toward STIBOR is created from Input Data contributed by the Panel Bank, and other sources, based on the hierarchical Input Data waterfall. What constitutes Input Data and the process of its contribution is described in STIBOR Panel Bank Code of Conduct.

To the greatest extent possible a Panel Bank's cost of funds is determined in Step 1 using Panel Bank contributed transactional evidence. To ensure robustness in the absence of transactions the STIBOR Calculation Methodology follows a hierarchical Input Data waterfall resulting in three possible levels of Panel Bank's contribution towards STIBOR.

These levels are employed progressively and, in the order, specified below:

- Level 1 consists of contributions based on transactions executed by the Panel Bank during the previous Business Day[1] that reflect the Panel Bank's cost of funds.
- Level 2 consists of contributions derived from the evidence of Level 1 transactions, using interpolation, and the application of a Market Adjustment Factor (MAF).
- Level 3 consists of:
    - For the Tom/Next and 1-week tenors, the Panel Bank shall use, hierarchically, data based on executable quotes, indicative prices, rates, or quotes with no firm commitment for execution, and data reliant on the expert judgment of the Panel Bank
    - For the 1 month, 2 months, 3 months, and 6 months tenor, the Panel Bank shall use their primary issuance prices of short-term securities, in particular certificates of deposit (CDs) and commercial paper (CP), weighted according to the information of its individual funding mix

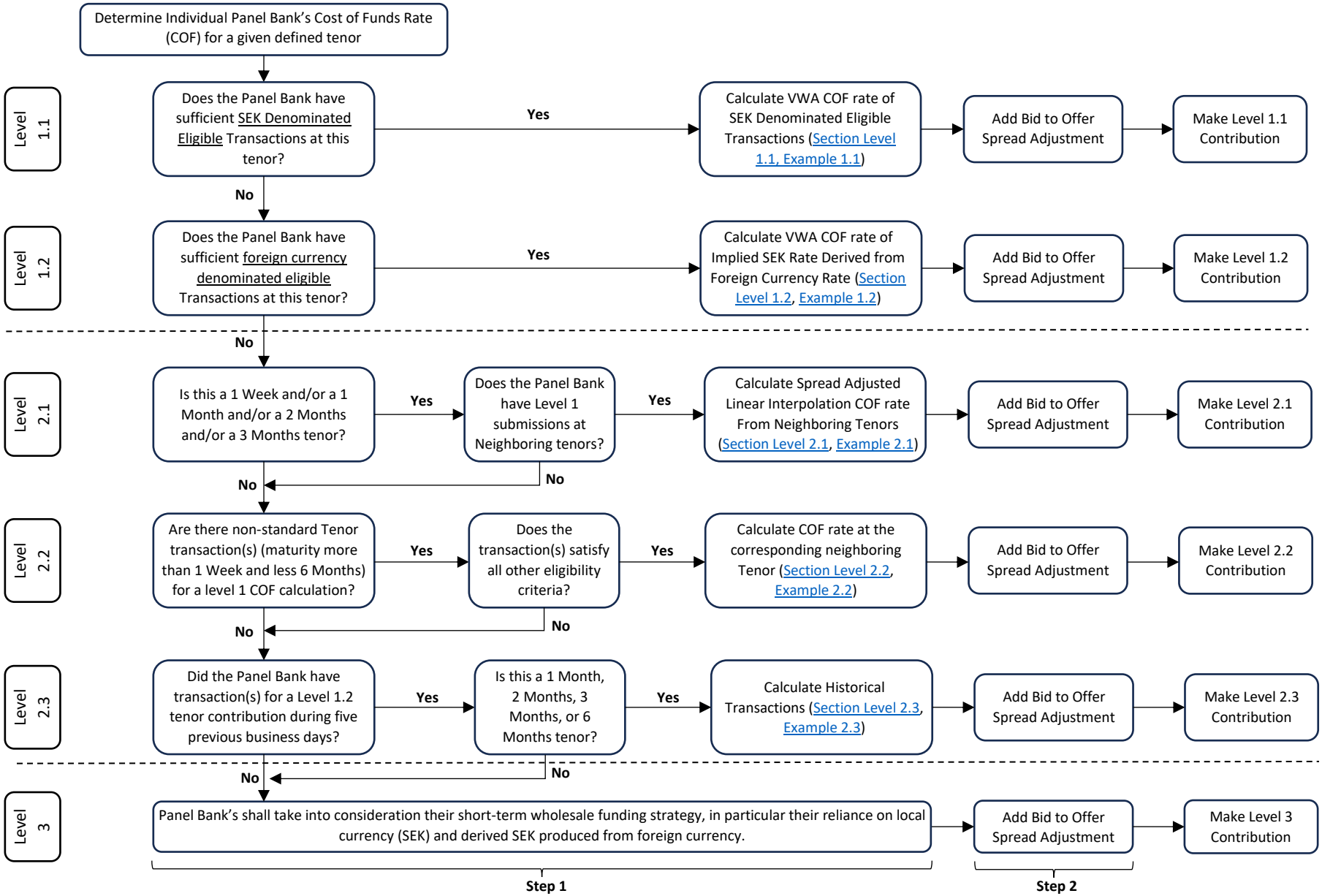
The application of the Input Data waterfall can be demonstrated through the use of an example as follows: if Input Data contributed by a given Panel Bank qualifies for a Level 1 contribution for the 1 month tenor, no further waterfall levels will be used for that tenor. If conditions for a Level 1 contribution for a 1 month tenor are not met, then the STIBOR calculation system will assess whether criteria for a Level 2 contribution for that tenor are

[1] Unless stated otherwise, Business Day always means Swedish business day, see Appendix 1

fulfilled, and if they are, no further waterfall level will be used. If the criteria for Level 1 and Level 2 cannot be met the Input Data from Level 3 will be utilised.

After an estimate of the Panel Banks' cost of funds has been obtained in Step 1 the STIBOR determination process progresses to Step 2. In Step 2 the STIBOR calculation system adds a Bid to Offer Spread (BOS), which represents the difference between the calculated estimated cost of funds rate and STIBOR's underlying interest. Figure below illustrates the STIBOR methodology for the waterfall and BOS application.

STIBOR determination Methodology – Overview



3 Precision and Numerical Representation

Calculation Agent System Calculations

This document is based on calculations processed by the Calculation Agent system with full precision. This means that all computations are carried out to 14 decimal places before final rounding. Therefore, the original calculated values maintain a high level of accuracy, incorporating all available decimal places during processing.

Document Display

For the purposes of clarity and readability in this document, calculated numerical values are presented to three decimal places. This approach has been chosen to simplify visual inspection and comparison of data. An ellipsis (…) is used following the third decimal to indicate that these numbers extend beyond the displayed precision. It is important to note that no rounding has been applied to the displayed figures; they are merely shortened versions of the full computational results. For instance, if the system calculates a value as (3,7097130733) it will be displayed in this document as (3,709…) indicating that the value continues beyond three decimal places, but only the first three are shown for simplicity.

4 Determination of Individual Panel Bank's **Cost of Funds Rate**

Level 1 Cost of Funds Calculation

Level 1 is subdivided into two different sub-levels, depending on the currency in which the underlying set of transactions was performed. In sub-level 1.1, only transactions executed in Swedish krona (SEK) are considered as eligible; in sub-level 1.2, transactions from a wider basket of foreign currencies are deemed eligible, including euro (EUR), British pound (GBP), and United States dollar (USD). In this second case, transaction rates and volumes are converted to their implied SEK rates and SEK-denominated volumes relying on standard formulas. Levels 1.1 and 1.2 are applied hierarchically, i.e. a Level 1.1 contribution takes precedence over Level 1.2.

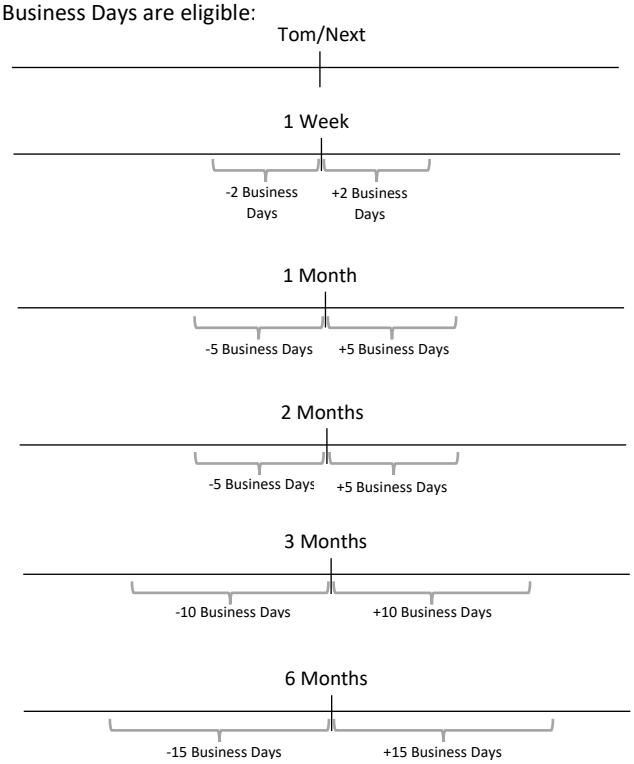
Level 1.1: SEK Denominated Eligible Transactions

A Panel Bank's Level 1.1 eligible transactions must meet the following criteria in the following table:

Table 1.

Nr.	Criteria	Description
1	**Currency denomination**	Only transactions directly denominated in Swedish krona are eligible
2	**Transaction timing**	Only transactions executed on Business Day T for Level 1.1 contribution for calculation of STIBOR on Business Day T+1 are eligible
3	**Funding and counterparty type**	Plain vanilla *funding* transactions conducted at a fixed rate, i.e. transactions with embedded options are not eligible, transactions conducted at a floating rate are not eligible. The following funding types are eligible: • Unsecured term deposits; • Short-term securities (certificates of deposit (CDs) and commercial paper (CP)), primary issuance).
4	**Counterparties**	The counterparty type must be in one of the following sector and or sub-sector categories:[2] • Non-financial corporations (S11) • General government (S13) • Central bank (excluding monetary policy operations) (S121) • Money Market Funds (MMFs) (S123) • Non-MMF investment funds (S124) • Other financial intermediaries (except insurance corporations and pension funds) (S125) • Financial auxiliaries (S126) • Captive financial institutions and money lenders (S127) • Insurance corporations (S128) • Pension funds (S129)
5	**Settlement Days**	Only transactions with a standard settlement date of T, T+1 or T+2 (Business Days) are eligible
6	**Maturity Days**	Only transactions with a maturity date on Business Days are eligible

[2] The counterparty types of classification rely on the definitions of institutional sectors and subsectors described in European System of Accounts (ESA 2010).

7	**Tenor Bucketing**	For each tenor, only transactions within the following maturity range, in Business Days are eligible: 
8	**Minimum Nominal Amount**	Only transactions with notional volume equal to or above SEK 100 million are eligible

On a given day, a Panel Bank's contribution at a given tenor shall be made using the Level 1.1 methodology if there is at least one qualifying transaction bucketed in the respective tenor.

Example 1.1 – Tom/Next SEK Transactions Calculation

The following is an example of the calculated Level 1.1 contribution for the Tom/Next (T/N) tenor based on two SEK denominated transactions. The example is for the following dates:

STIBOR Calculation Date	**2024-02-07**
Trade Date	2024-02-06

Part 1. The input data : Following data from one panel bank is obtained:

Input Data from Panel Bank	Value	Reference/Operation
Transaction ID	TX1	(1)
Volume (SEK)	100 000 000	(2)
Transaction Rate (SEK, %)	3,5	(3)
Trade Date	2024-02-06	(3)
Settlement Date	2024-02-07	(4)
Maturity Date	2024-02-08	(5)
Tenor	Tom/Next	(6)

Input Data from Panel Bank	Value	Reference/Operation
Transaction ID	TX2	(7)
Volume (SEK)	150 000 000	(8)
Transaction Rate (SEK, %)	4,0	(9)
Trade Date	2024-02-06	(10)
Settlement Date	2024-02-07	(11)
Maturity Date	2024-02-08	(12)
Tenor	Tom/Next	(13)

Part 2. Volume Weighted Average (VWA) Cost of Funds (COF) : The Panel Bank's Cost of Funds (COF) rate is calculated as the volume weighted average (VWA) of the rates and rounded to three decimals accordingly:

Volume Weighted Average Cost of Funds Calculation			
Variable	Value	Reference/Operation	Equations From Calculation Methodology
TX1 – Volume (SEK)	100 000 000	(1)	$vol_1^{\square}$
TX1 – Rate (SEK, %)	3,5	(2)	$r_1^{\square}$
TX2 – Volume (SEK)	150 000 000	(3)	$vol_2^{\square}$
TX2 – Rate (SEK, %)	4,0	(4)	$r_2^{\square}$
Volume Weighted Average Cost of Funds (COF)	3,8	$(5) = \frac{(1) * (2) + (3) * (4)}{(1) + (3)}$	$WVA = \frac{\sum_{i=1}^{n}(r_i^{\square} \cdot vol_i^{\square})}{\sum_{i=1}^{n} vol_i^{\square}}$

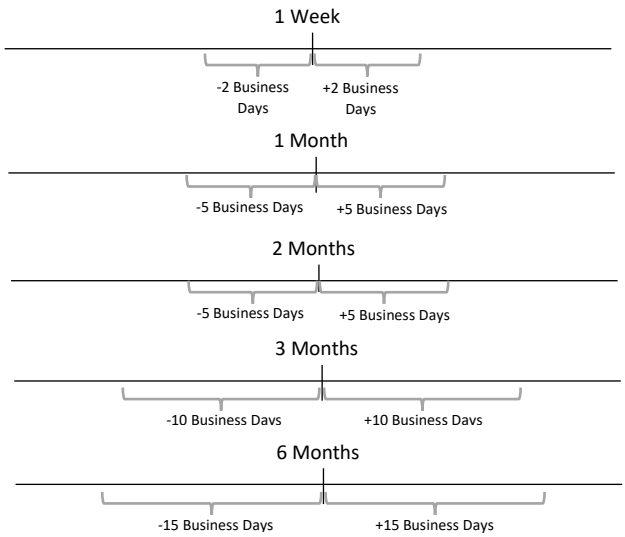
Part 3. Bid to Offer Spread (BOS) : A Bid to Offer Spread (BOS) is added to the VWA COF from Part 1 to derive a Level 1.1 contribution for the Tom/Next tenor. The BOS is either automatically applied by the STIBOR calculation system – the default BOS in this case 8 basis points (0.08) for Tom/Next tenor, or the altered BOS is provided by the Panel Bank under specific scenarios. Table below summarizes this part:

Bid to Offer Spread (BOS) Adjustment		
Variable	Value	Reference/Operation
VWA COF (%)	3,8	(1)
Default BOS	0,08	(2)
Level 1.1 Contribution (%)	3,88	(3) = (1) + (2)

Level 1.2: Foreign Currency Denominated Eligible Transactions

A Panel Bank's Level 1.2 eligible transactions must meet the following criteria in the table below:

Table 2.

Nr.	Criteria	Description
1	**Currency denomination**	Only transactions directly denominated in USD, EUR and GBP are eligible
2	**Transaction timing**	Only transactions a standard settlement date of T, T+1 or T+2 (Business Days) are eligible
3	**Funding and counterparty type**	Plain vanilla funding transactions conducted at a fixed rate, i.e. transactions with embedded options are not eligible, transactions conducted at a floating rate are not eligible. The following funding types are eligible: • Short-term securities (certificates of deposit (CDs) and • commercial paper (CP), (primary issuance)
4	**Counterparties**	The counterparty type must be in one of the following sector and or sub-sector categories:[3] • Non-financial corporations (S11) • General government (S13) • Central bank (excluding monetary policy operations) (S121) • Money Market Funds (MMFs) (S123) • Non-MMF investment funds (S124) • Other financial intermediaries (except insurance corporations and pension funds) (S125) • Financial auxiliaries (S126) • Captive financial institutions and money lenders (S127) • Insurance corporations (S128) • Pension funds (S129)
5	**Settlement Days**	Only transactions with a standard settlement date of T, T+1 or T+2 (Business Days) are eligible
6	**Maturity Days**	Only transactions with a maturity date on Business Days are eligible
7	**Tenor Bucketing**	For each tenor, only transactions within the following maturity range, in Business Days are eligible: 
8	**Minimum Nominal Amount**	Only transactions with exchanged notional volume equal to or above SEK 100 million are eligible

[3] The counterparty types of classification rely on the definitions of institutional sectors and subsectors described in European System of Accounts (ESA 2010).

Forward Rate Specification and Calculation

To calculate the implied SEK rate from transactions denominated in foreign currencies forward rate must be calculated for each transaction. Following formula applies for the forward rate:

$$Forward\ Rate\ (F_{FCY}^{SEK}) = Spot\ Rate\ (S_{FCY}^{SEK}) + forward\ points\ (fwd)$$

To obtain the forward rate used for the calcualtion the appropriate forward points (fwd) need to be derived based on the nature of the transaction. Additionally, the corresponding spot rate is added to it to produce the resulting forward rate. The forward points is adjusted to match the exact day count of each transaction by taking into the account settlement and maturity date. Figure below illstrates the idea of the adjustment of forward points (fwd) to match the exact day count of a transaction with durations longer then the relevent transactions' tenor:

Figure 1.

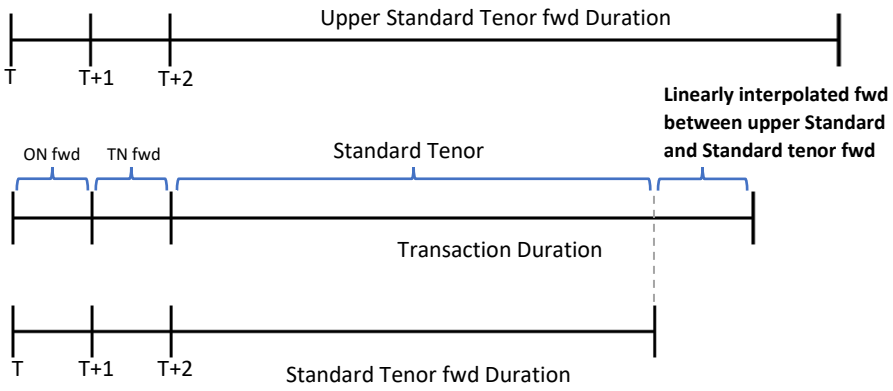


Table 3.

Parameter	Description
Standard Tenor fwd	Forward points for the relevant transaction's tenor meaning the STIBOR tenor within whose bucket the transaction falls or the closest upper or lower STIBOR tenor in the case of off-tenor transactions (Level 2.2). For instance, a USD transaction with a maturity of 3 months, the standard 3 months forward point from US Dollar to Swedish Krona is used (WM/Refinitiv Closing Mid Forward Rates (4pm London time, day T))
Upper Standard Tenor fwd	Forward points for the upper neighbor correspond to the closest higher STIBOR tenor forward points. For instance, an upper forward points for a transaction longer than 3 months is forward points for the 6 months that is used in the linear interpolation to match the transaction's days
TN fwd	Tom/Next forward points are added for transactions settled on T+1. For instance, a transaction with a trade date of 2024-02-06 and settlement date of 2024-02-07 is categorized as a transaction settled on T+1.
ON fwd	Sum of Overnight FX forward points and Tom/Next forward points are added for transaction settled on T. For instance, a transaction with a trade date of 2024-02-06 and settlement date of 2024-02-06 is categorized as a transaction settled on T+0 (T).

The mathematical representation of adjusting forward points (fwd) follows accordingly:

For transactions longer than the standard transaction's tenor i.e. difference between transaction day count $D[TX]$ and summarized day count of the first two parts ($D[Standard\ Tenor + ON + TN]$) is **positive** :

$$\underbrace{Standard\ tenor}_{(1)} + \underbrace{(ON) + (TN)}_{(2)} + \underbrace{[UPPERtenor - Standard\ Tenor] * \frac{D[TX] - D[(Standard\ Tenor) + (ON) + (TN)]}{D[UPPERtenor] - D[Standard\ Tenor]}}_{(3)}$$

(1) Forward points for the relevant transaction's tenor (***Standard Tenor***)

(2) The second part accounts for transactions settled on T+1 or T+0. TN forward points are taken for transactions settled on T+1. The sum of ON forward points and TN forward points is taken for transactions settled on T+0.

(3) Linear interpolated forward points between the upper and Standard Tenor forward points

For transactions shorter than the standard transaction's tenor i.e. difference between transaction day count $D[TX]$ and summarized day count of the first two parts ($D[Standard\ Tenor + ON + TN]$) is **negative**:

$$\underbrace{Standard\ Tenor}_{(1)} + \underbrace{(ON) + (TN)}_{(2)} - \underbrace{[Standard\ Tenor - LOWERtenor] * \frac{D[Standard\ Tenor + (ON) + (TN)] - D[TX]}{D[Standard\ Tenor] - D[LOWERtenor]}}_{(3)}$$

(1) Forward points for the relevant transaction's tenor (***Standard Tenor***)

(2) The second part accounts for transactions settled on T+1 or T+0. TN forward points are taken for transactions settled on T+1. The sum of ON forward points and TN forward points is taken for transactions settled on T+0.

(3) Linear interpolated forward points between the lower and Standard Tenor forward points

Example 1.2 – USD Transaction with T+2 Settlement Date & Perfect Duration Match

The following is an example of Level 1.2 contribution for the 6 Months (6M) tenor based on a foreign currency denominated transaction. This is for calculating contribution for STIBOR 6M on 2024-02-07 accordingly:

STIBOR Calculation Date	**2024-02-07**
Trade Date	2024-02-06

Part 1. The input data: Following data from the panel bank is obtained:

Input Data from Panel Bank	Value	Reference/Operation
Transaction ID	TX1	(1)
Volume (USD)	10 000 000	(2)
Transaction Rate (USD, %)	5,0	(3)
Trade Date	2024-02-06	(3)
Settlement Date	2024-02-08	(4)
Maturity Date	2024-08-08	(5)
Tenor	6 Months	(6)

Part 2. Forward Rate Calculation: To calculate the implied SEK rate for the Transaction ID TX1 using the corresponding day count and the original transaction USD rate from Part 1, one needs to calculate the forward rate for the transaction. This is obtain by using the relevant spot rate and forward point from the external data source (WM/Refinitiv Closing Mid Spot Rates, 4pm London time, day T) accordingly:

Forward Rate Calculation		
Input/Calculated Data from External Data Source	Value	Reference/Operation
Trade Date	2024-02-06	(1)
Spot Rate, USD to SEK	10,55985	(2)
Forward Points, 6 Months USD/SEK	-0,073504	(3)
Forward Rate	10,486…	(4) = (2) + (3)

Notice that this part looks different based on the nature of the transaction denominated in foreing corrency.

Part 3. Implied SEK Rate Calculation : The obtained spot rate and forward rate is used to calculate the implied SEK rate for the transaction accordingly:

Implied SEK Rate Calculation			
Variable	Value	Reference/Operation	Representation From Calculation Methodology
Transaction ID	TX1	(1)	
Transaction Rate	5,0	(2)	r_i^{FCY}
Transaction Day Count	182	(3) = (2024-08-08) – (2024-02-08)	Act = (Maturity Date – Settlement Date)
Spot Rate, USD to SEK	10,55985	(4)	S_{FCY}^{SEK}
Forward Rate	10,486…	(5)	F_{FCY}^{SEK}
Standard Year Length for USD Rate	360	(6)	Y_{FCY}
Standard Year Length for SEK Rate	360	(7)	Y_{SEK}
Implied SEK Rate (%)	3,588…	$(8) = \left(\frac{(5)}{(4)}\left(1 + \frac{(2)}{100}\frac{(3)}{(6)}\right) - 1\right)\frac{(7)}{(3)}$	$r_i^{SEK} = \left(\frac{F_{FCY}^{SEK}}{S_{FCY}^{SEK}}\left(1 + r_i^{FCY}\frac{Act}{Y_{FCY}}\right) - 1\right)\frac{Y_{SEK}}{Act}$

Part 4. Repetation : The previous parts are repeated (i.e. from Part 1 to Part 3) for all remaining foreign denominated transactions. In this case, there is only one transaction and calculation proceeds to the next part.

Part 5. Volume Weighted Average (VWA) Cost of Funds(COF) Calculation : The derived implied SEK rate for all transactions, the volume weighted average (VWA) Cost of Funds (COF) rate is obtained accordingly and rounded to three decimals:

Volume Weighted Average (VWA) Cost of Funds (COF)			
Variable	Value	Reference/Operation	Representation From Calculation Methodology
TX1 – Volume (USD)	10 000 000	(1)	vol_i^{FCY}
TX1 – Rate (USD, %)	5,0	(2)	r_i^{FCY}
Spot Rate, USD to SEK	10,55985	(3)	S_{FCY}^{SEK}
TX1 – Volume (SEK)	105 598 500	(4) = (1) * (3)	$vol_i^{SEK} = vol_i^{FCY} \cdot S_{FCY}^{SEK}$
Implied SEK Rate	3,588…	(5)	r_i^{SEK}
Volume Weighted Average Cost of Funds (%)	3,588	$(6) = \frac{(5) * (4)}{(4)}$	$WVA = \frac{\sum_{i=1}^{n}(r_i^{SEK} \cdot vol_i^{SEK})}{\sum_{i=1}^{n} vol_i^{SEK}}$

Part 6. Bid to Offer Spread (BOS) : A Bid to Offer Spread (BOS) is added to the VWA COF from Part 5 to derive a Level 1.2 contribution for the 6 Months tenor. The BOSt is either automatically applied by the STIBOR calculation system – the default BOS,in this case 15 basis points (0.15) for 6 Months tenor, or the altered BOS is provided by the Panel Bank under specific scenarios. Table below summarizes this part:

Bid to Offer Spread (BOS) Adjustment		
Variable	Value	Reference/Operation
VWA COF (%)	3,588	(1)
Default BOS	0,15	(2)
Level 1.2 Contribution (%)	3,738	(3) = (1) + (2)

Example 1.2 – GBP Transaction with T+1 Settlement Date & Longer Duration

The following is an example of Level 1.2 contribution for the 6 Months (6M) tenor based on a foreign currency denominated transaction. This is for calculating contribution for STIBOR 6M on 2024-02-07 accordingly:

STIBOR Calculation Date	**2024-02-07**
Trade Date	2024-02-06

Part 1. The input data: Following data from the panel bank is obtained:

Input Data from Panel Bank	Value	Reference/Operation
Transaction ID	TX1	(1)
Volume (GBP)	10 000 000	(2)
Transaction Rate (GBP, %)	5,0	(3)
Trade Date	2024-02-06	(3)
Settlement Date	2024-02-07	(4)
Maturity Date	2024-08-12	(5)
Tenor	6 Months	(6)

Part 2. Forward Rate Calculation : Since the settlement of the transaction is T+1 and the duration of transaction is longer than the relevant transaction's tenor forward points, the adjustment must be applied in order to derive the appropriate forward points accordingly:

Forward Rate Calculation			
Input/Calculated Data from External Data Source	Value	Reference/Operation	Representation From Calculation Methodology
Trade Date	2024-02-06	(1)	
Spot Rate, UK Pound Sterling to SEK	13,28165	(2)	
Forward Points, 9 Months UK Pound/SEK	-0,131168	(3)	$UPPERtenor$
Forward Points, 6 Months UK Pound/SEK	-0,084464	(4)	$Standard\ Tenor$
Forward Points, Tom/Next UK Pound/SEK	-0,000447	(5)	TN
Standard 9 Months Day Count	274	(6) = (2024-11-08) – (2024-02-08)	$D[UPPERtenor]$
Standard 6 Months Day Count	182	(7) = (2024-08-08) – (2024-02-08)	$D[Standard\ Tenor]$
Standard Tom/Next Day Count	1	(8) = (2024-02-08) – (2024-02-07)	$D[TN]$
Transaction Day Count	187	(9) = (2024-08-12) – (2024-02-07)	$D[TX]$
Adjusted 6 Months Forward Points UK Pound/SEK	-0,086…	$(10) = (4) + (5) + [(3) - (4)] * \frac{(9) - ((7) + (8))}{(6) - (7)}$	$Standard\ tenor + (TN) + [UPPERtenor - Standard\ Tenor] * \frac{D[TX] - D[(Standard\ Tenor) + (TN)]}{D[UPPERtenor] - D[Standard\ Tenor]}$
Forward Rate	13,194…	(11) = (10) + (2)	

Notice that this part looks different based on the nature of the transaction denominated in foreing corrency.

Part 3. Implied SEK Rate Calculation : The obtained spot rate and forward rate is used to calculate the implied SEK rate for the transaction accordingly:

Implied SEK Rate Calculation			
Variable	Value	Reference/Operation	Representation From Calculation Methodology
Transaction ID	TX1	(1)	
Transaction Rate (GBP, %)	5,0	(2)	r_i^{FCY}
Transaction Day Count	187	(3) = (2024-08-12) – (2024-02-07)	Act = (Maturity Date – Settlement Date)
Spot Rate, GBP to SEK	13,28165	(4)	S_{FCY}^{SEK}
Forward Rate	13,194…	(5)	F_{FCY}^{SEK}
Standard Year Length for GBP Rate	365	(6)	Y_{FCY}
Standard Year Length for SEK Rate	360	(7)	Y_{SEK}
Implied SEK Rate (%)	3,638…	$(8) = \left(\frac{(5)}{(4)}\left(1 + \frac{(2)}{100}\frac{(3)}{(6)}\right) - 1\right)\frac{(7)}{(3)}$	$r_i^{SEK} = \left(\frac{F_{FCY}^{SEK}}{S_{FCY}^{SEK}}\left(1 + r_i^{FCY}\frac{Act}{Y_{FCY}}\right) - 1\right)\frac{Y_{SEK}}{Act}$

Part 4. Repetition : The previous parts are repeated (i.e. from Part 1 to Part 3) for all remaining foreign denominated transactions. In this case, there is only one transaction and calculation proceed to the next part.

Part 5. Volume Weighted Average (VWA) Cost of Funds (COF) Rate Calculation : When the implied SEK rate is derived for all transactions, the volume weighted average Cost of Funds rate is obtained accordingly and rounded to three decimals:

Volume Weighted Average (VWA) Cost of Funds (COF) Rate Calculation			
Variable	Value	Reference/Operation	Representation From Calculation Methodology
TX1 – Volume (GBP)	10 000 000	(1)	vol_i^{FCY}
TX1 – Rate (GBP, %)	5,0	(2)	r_i^{FCY}
Spot Rate, GBP to SEK	13,28165	(3)	S_{FCY}^{SEK}
TX1 – Volume (SEK)	132 816 500	(4) = (1) * (3)	$vol_i^{SEK} = vol_i^{FCY} \cdot S_{FCY}^{SEK}$
Implied SEK Rate	3,638…	(5)	r_i^{SEK}
Volume Weighted Average Cost of Funds (%)	3,639	$(6) = \frac{(5) * (4)}{(4)}$	$WVA = \frac{\sum_{i=1}^{n}(r_i^{SEK} \cdot vol_i^{SEK})}{\sum_{i=1}^{n} vol_i^{SEK}}$

Part 6. Bid to Offer Spread (BOS) : A Bid to Offer Spread (BOS) is added to the VWA COF from Part 5 to derive a Level 1.2 contribution for the 6 Months tenor. The BOS is either automatically applied by the STIBOR calculation system – the default BOS in this case 15 basis points (0.15) for 6 Months tenor, or the altered BOS is provided by the Panel Bank under specific scenarios. Table below summarizes this part:

Bid to Offer Spread (BOS) Adjustment		
Variable	Value	Reference/Operation
VWA COF (%)	3,639	(1)
Default BOS	0,15	(2)
Level 1.2 Contribution (%)	3,789	(3) = (1) + (2)

Example 1.2 – EUR Transaction with T+0 Settlement Date & Shorter Duration

The following is an example of Level 1.2 contribution for the 6 Months (6M) tenor based on a foreign currency denominated transaction. This is for calculating contribution for STIBOR 6M on 2024-02-07 accordingly:

STIBOR Calculation Date	**2024-02-07**
Trade Date	2024-02-06

Part 1. The input data : Following data from the panel bank is obtained:

Input Data from Panel Bank	Value	Reference/Operation
Transaction ID	TX1	(1)
Volume (EUR)	10 000 000	(2)
Transaction Rate (EUR, %)	3,5	(3)
Trade Date	2024-02-06	(3)
Settlement Date	2024-02-06	(4)
Maturity Date	2024-08-01	(5)
Tenor	6 Months	(6)

Part 2. Forward Rate Calculation : Since the settlement of the transaction is T+0 and the duration of transaction is longer than the relevant transaction's tenor forward points, the adjustment must be applied in order to derive the appropriate forward points accordingly:

Forward Rate Calculation			
Input/Calculated Data from External Data Source	Value	Reference/Operation	Representation From Calculation Methodology
Trade Date	2024-02-06	(1)	
Spot Rate, EUR to SEK	11,3455	(2)	
Forward Points, 3 Months EUR/SEK	0,001915	(3)	$LOWERtenor$
Forward Points, 6 Months EUR/SEK	0,006345	(4)	$Standard\ Tenor$
Forward Points, Tom/Next EUR/SEK	-0,000008	(5)	TN
Forward Point, Overnight EUR/SEK	0,000006	(6)	ON
Standard 3 Months Day Count	90	(7) = (2024-05-08) – (2024-02-08)	$D[LOWERtenor]$
Standard 6 Months Day Count	182	(8) = (2024-08-08) – (2024-02-08)	$D[Standard\ Tenor]$
Standard Tom/Next Day Count	1	(9) = (2024-02-08) – (2024-02-07)	$D[TN]$
Standard Overnight Day Count	1	(10) = (2024-02-07) – (2024-02-06)	$D[ON]$
Transaction Day Count	177	(11) = (2024-08-01) – (2024-02-06)	$D[TX]$
Adjusted 6 Months Forward Points EUR/SEK	0,006…	$(12) = (4) + (5) + (6) - [(4) - (3)] * \frac{(8)+(9)+(10)-(11)}{(8)-(7)}$	$Standard\ tenor + (TN) + (ON) - [Standard\ Tenor\ -\ Lowertenor] * \frac{D[Standard\ Tenar) + (TN) + (ON)] - D[TX]}{D[Standard\ Tenor] - D[LOWERtenor]}$
Forward Rate	11,351…	(13) = (11) + (2)	

Notice that this part looks different based on the nature of the transaction denominated in foreing corrency.

Part 3. Implied SEK Rate Calculation : The obtained spot rate and forward rate is used to calculate the implied SEK rate for the transaction accordingly:

Implied SEK Rate Calculation			
Variable	Value	Reference/Operation	Representation From Calculation Methodology
Transaction ID	TX1	(1)	
Transaction Rate (EUR, %)	3,5	(2)	r_i^{FCY}
Transaction Day Count	177	(3) = (2024-08-01) – (2024-02-06)	Act = (Maturity Date – Settlement Date)
Spot Rate, EUR to SEK	11,3455	(4)	S_{FCY}^{SEK}
Forward Rate	11,351…	(5)	F_{FCY}^{SEK}
Standard Year Length for EUR Rate	360	(6)	Y_{FCY}
Standard Year Length for SEK Rate	360	(7)	Y_{SEK}
Implied SEK Rate (%)	3,609…	$(8) = \left(\frac{(5)}{(4)}\left(1 + \frac{(2)\ (3)}{100\ (6)}\right) - 1\right)\frac{(7)}{(3)}$	$r_i^{SEK} = \left(\frac{F_{FCY}^{SEK}}{S_{FCY}^{SEK}}\left(1 + r_i^{FCY}\frac{Act}{Y_{FCY}}\right) - 1\right)\frac{Y_{SEK}}{Act}$

Part 4. Repitition : The previous parts are repeated (i.e. from Part 1 to Part 3) for all remaining foreign denominated transactions. In this case, there is only one transaction and calculation proceed to the next part.

Part 5. Volume Weighted Average (VWA) Cost of Funds (COF) Calculation : The implied SEK rate derived for all transactions, the volume weighted average (VWA) Cost of Funds (COF) rate is obtained accordingly and rounded to three decimals:

Volume Weighted Average (VWA) Cost of Funds (COF) Calculation			
Variable	Value	Reference/Operation	Representation From Calculation Methodology
TX1 – Volume (EUR)	10 000 000	(1)	vol_i^{FCY}
TX1 – Rate (EUR, %)	3,5	(2)	r_i^{FCY}
Spot Rate, EUR to SEK	11,3455	(3)	S_{FCY}^{SEK}
TX1 – Volume (SEK)	113 455 000	(4) = (1) * (3)	$vol_i^{SEK} = vol_i^{FCY} \cdot S_{FCY}^{SEK}$
Implied SEK Rate	3,609…	(5)	r_i^{SEK}
Volume Weighted Average Cost of Funds (%)	3,609	$(6) = \frac{(5)\ *\ (4)}{(4)}$	$WVA = \frac{\sum_{i=1}^{n}(r_i^{SEK} \cdot vol_i^{SEK})}{\sum_{i=1}^{n} vol_i^{SEK}}$

Part 6. Bid to Offer Spread (BOS) : A Bid to Offer Spread (BOS) is added to the VWA COF from Part 5 to derive a Level 1.2 contribution for the 6 Months tenor. The BOS is either automatically applied by the STIBOR calculation system – the default BOS in this case 15 basis points (0.15) for 6 Months tenor, or the altered BOS is provided by the Panel Bank under specific scenarios. Table below summarizes this part:

Bid to Offer Spread (BOS) Adjustment		
Variable	Value	Reference/Operation
VWA COF (%)	3,609	(1)
Default BOS	0,15	(2)
Level 1.2 Contribution (%)	3,759	(3) = (1) + (2)

Level 2 Cost of Funds Calculation

Level 2 Cost of Funds (COF) rates are calculated when a Panel Bank does not have sufficient transactions to qualify for a Level 1 COF rate calculation, but has had transactions in a nearby tenor or recent transactions to support a Level 1. COF rate calculation. Level 2 is subdivided into three different sublevels, that apply hierarchically:

Level 2.1 – Adjusted linear interpolation from neighbouring tenors

Level 2.2 – Transactions with maturity at broken dates

Level 2.3 – Transactions from previous days.

Table with Tenor applicibality for Level 2 contributions.

Tenor	Level 2.1	Level 2.2	Level 2.3
Tom/Next	**Not** Applicable	**Not** Applicable	**Not** Applicable
1 Week	Applicable	Applicable	**Not** Applicable
1 Month	Applicable	Applicable	Applicable
2 Months	Applicable	Applicable	Applicable
3 Months	Applicable	Applicable	Applicable
6 Months	**Not** Applicable	Applicable	Applicable

Level 2.1: Adjusted Linear Interpolation from Neighbouring Tenors

This level of the methodology may only be applied for the calculation of COF rates toward the 1 week, 1 month, 2 months, and 3 months tenors, and only when Level 1 COF rates for the day have been determined for both the respective neighbouring tenors, i.e. a 1 month COF rate under Level 2.1 is derived from Level 1 COF rates in the 1 week and 2 months tenors. Consider the following example scenarios where the Level 2.1 can be calculated (notice the waterfall methodology, i.e. only when Cost of Funds for the day could not be derived from any of the previous methodological levels) for the applicable tenors using the Level 1 contributions accordingly:

Panel Bank's Cost of Funds						
Tenor	Tom/Next	1 Week	1 Month	2 Months	3 Months	6 Months
Scenario 1	Level 1	**Level 2.1**	Level 1	**Level 2.1**	Level 1	Level 1
Scenario 2	Level 1	Level 1	**Level 2.1**	Level 1	**Level 2.1**	Level 1

Example 2.1 Contribution (Adjusted Linear Interpolation from neighboring tenors)

The following is an example of Level 2.1 contribution for the 1 Month (1M) tenor based on the two Level 1 respective neighbouring tenors i.e. (1 Week and 2 Months). This example is similar to the Scenario 2 in the table above. The following input data is obtained from STIBOR calculation date 2024-02-07:

STIBOR Calculation Date	**2024-02-07**
Trade Date	2024-02-06

Part 1. The input data : Following data from the panel bank is obtained for this day (STIBOR Calculation Date):

Panel Bank's Cost of Funds (COF, %)			
Tenor	1 Week	1 Month	2 Months
Contribution Level	Level 1	**No** Level 1 Contribution	Level 1
Cost of Funds Rate (%)	3,5	-	4,5

Part 2. Adjusted Linear Interpolation of Neighboring Tenors : A simple linear interpolation for 1 Month tenor is calculated using the two neighbouring Level 1 Panel Bank's Cost of Fund rates (COF) as anchors, i.e., for 1 Week and 2 Month tenor, for the given STIBOR calculation day (2024-02-07). The interpolation along with individual inputs, the applied formula, and the day count setting is presented below:

Adjusted Linear Interpolation from Neighboring Tenors			
Variable	Value	Reference/Operation	Representation From Calculation Methodology
Trade Date	2024-02-06	(1)	
Standard 1 Week Day Count	7	(2) = (2024-02-15) – (2024-02-08)	d_{t-1}
Standard 1 Month Day Count	29	(3) = (2024-03-08) – (2024-02-08)	d_t
Standard 2 Months Day Count	60	(4) = (2024-04-08) – (2024-02-08)	d_{t+1}
Panel Bank's 1 Week COF (%, Level 1)	3,5	(5)	r_{t-1}^{L1}
Panel Bank's 1 Month COF (%, Level 1)	4,5	(6)	r_{t+1}^{L1}
PB's Interpolated 1 Months (COF)	3,915…	$(7) = (5) + \frac{((6)-(5)) * ((3)-(2))}{(4)-(2)}$	$r_t^{int} = r_{t-1}^{L1} + \frac{(r_{t+1}^{L1} - r_{t-1}^{L1}) \cdot (d_t - d_{t-1})}{d_{t+1} - d_{t-1}}$

Part 3. Spread Adjustment Factor Calculation : Morevoever, a Spread Adjustment Factor (SAF) is derived for the Level 2.1 tenor with the primary purpose to correct the over- or underestimation arising from the linear interpolation. The SAF achieves this by adjusting the curve based on the average difference (spread) between the interpolated rates and actual rates over the most recent five business day period.

STIBOR Calculation Date	Trade Date	Settlement Date	1 Week Maturity Date	1 Month Maturity Date	2 Months Maturity Date
2024-02-06	2024-02-05	2024-02-07	2024-02-14	2024-03-07	2024-04-08
2024-02-05	2024-02-02	2024-02-06	2024-02-13	2024-03-06	2024-04-08
2024-02-02	2024-02-01	2024-02-05	2024-02-12	2024-03-05	2024-04-05
2024-02-01	2024-01-31	2024-02-02	2024-02-09	2024-03-04	2024-04-02
2024-01-31	2024-01-30	2024-02-01	2024-02-08	2024-03-01	2024-04-02
		(1)	(2)	(3)	(4)

STIBOR Calculation Date	1 Week Day Count	1 Month Day Count	2 Months Day Count
2024-02-06	7	29	61
2024-02-05	7	29	62
2024-02-02	7	29	60
2024-02-01	7	31	60
2024-01-31	7	29	61
	(2) – (1)	(3) – (1)	(4) – (1)

Spread Calculation								
	PB's Cost of Funds (COF, %)			Day Count			PB' Linear Interpolated COF (%)	Spread
Lookback – Last 5 Swedish business days	1 W	1 M	2 M	1 W	1 M	2 M	1 Months	
	Level 1/2/3	Level 1/2/3	Level 1/2/3				L2.1	
2024-02-06	3,86	3,87	3,90	7	29	61	3,876…	-0,006…
2024-02-05	3,85	3,86	3,89	7	29	62	3,866…	-0,006…
2024-02-02	3,82	3,84	3,88	7	29	60	3,844…	-0,004…
2024-02-01	3,81	3,83	3,87	7	31	60	3,837…	-0,007…
2024-01-31	3,80	3,82	3,86	7	29	61	3,824…	-0,004…
Reference/Operation		(1)					(2)	**(3)** = (1) – (2)
Representation From Calculation Methodology	$PB_{t-1,i}$	$PB_{t,i}$	$PB_{t+1,i}$	$d_{t-1,i}$	$d_{t,i}$	$d_{t+1,i}$		$PB_{t,i} - PB_{t-1,i} - \frac{(PB_{t+1,i} - PB_{t-1,i}) \cdot (d_{t,i} - d_{t-1,i})}{d_{t+1,i} - d_{t-1,i}}$

Spread Adjustment Factor is calculated as the average of the spread **(3)** and obtained accordingly:

Spread Adjustment Factor (SAF)			
Variable	Value	Operation	Representation from Methodology
SAF	-0,005…	(4) = Average of **(3)**	$SAF = \frac{1}{5}\sum_{i=1}^{5}\left(PB_{t,i} - PB_{t-1,i} - \frac{(PB_{t+1,i} - PB_{t-1,i}) \cdot (d_{t,i} - d_{t-1,i})}{d_{t+1,i} - d_{t-1,i}}\right)$

Part 4. Level 2.1 Calculation : The calculated SAF is added to the initial PB's interpolated COF (%) and rounded to three decimal places to accordingly:

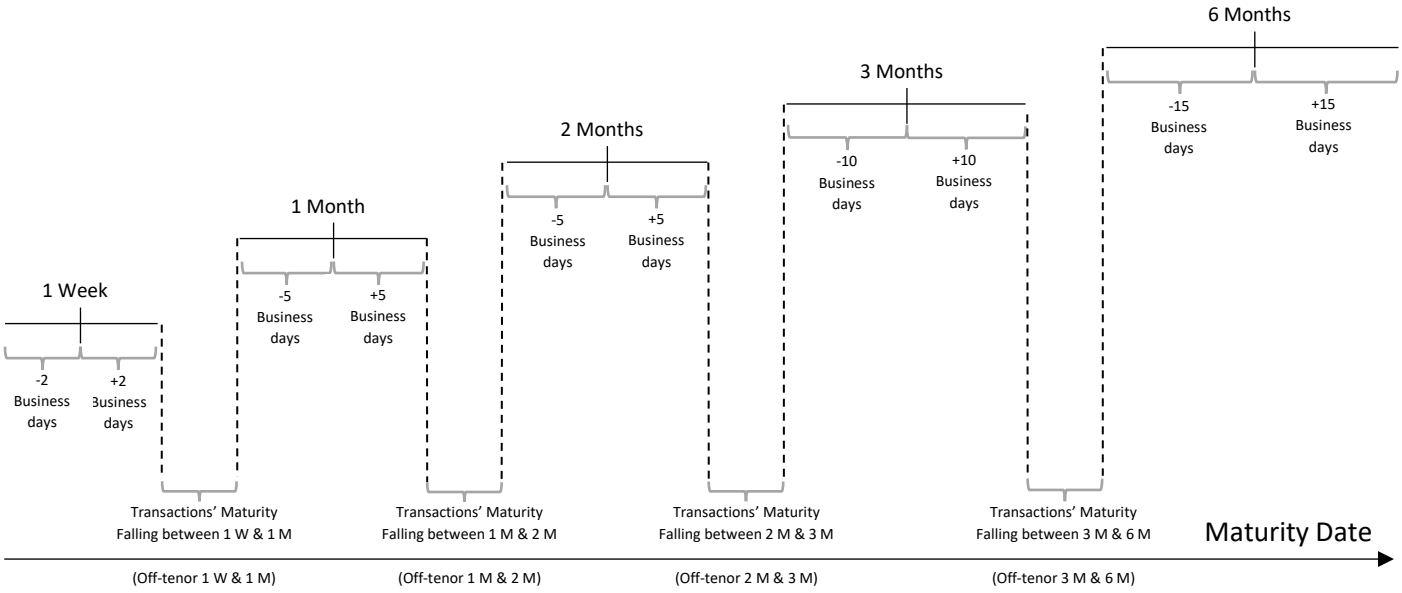
Level 2.1 Calculation			
Variable	Value	Reference/Operation	Representation From Calculation Methodology
PB's Interpolated 1 Month COF (%)	3,915…	(1)	r_t^{int}
Spread Adjustment Factor	-0,005…	(2)	SAF
Level 2.1 COF (%)	3,909	(3) = (1) + (2)	$r_t = r_t^{int} + SAF$

Part 5. Bid to Offer Spread Adjustment (BOS) : A default Bid to Offer Spread adjustment (BOS) is added to the Level 2.1 COF from the Part 4 to derive Level 2.1 contribution for 1M tenor. The BOS adjustment is either automatically performed by the STIBOR calculation system – default BOS (in this case 0.15 for 1M Tenor) or altered BOS is provided by a Panel Bank under specific cases.

Bid to Offer Spread (BOS) Adjustment		
Variable	Value	Reference/Operation
PB's Level 2.1 COF (%)	3,909	(1)
Default BOS	0,15	(2)
Level 2.1 Contribution (%)	4,059	(3) = (1) + (2)

Level 2.2: Off-Tenor Transactions

For a Cost of Funds rate at Level 2.2, the methodology considers transactions that do not satisfy the standard tenor corridors for a Level 1 COF calculation, but satisfy all other eligibility criteria. Transactions eligible for a Level 2.2 COF calculation must have maturities of more than 1 week and less than 6 months and fall outside of respective tenor bucketing, see figure below. Level 2.2 is applied only in cases in which a COF rate could not be derived from any of the previous methodological levels. The objective of this technique is to derive COF rates for STIBOR tenors via the reallocation of volume and derivation of rates from off-tenor transactions using simple mathematical tools. Level 2.2 rates are determined based on a parallel shift which replicates the slope of the Panel Bank's COF yield curve from the previous day.



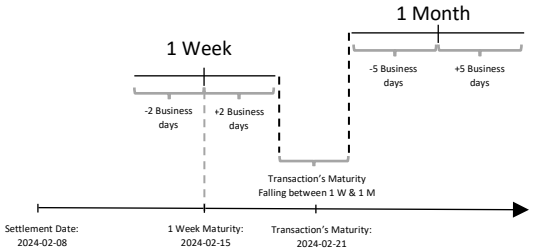
Example 2.2 Off-tenor SEK Transaction

The following is an example of a Level 2.2 contribution for the 1 Week (1W) and 1 Month (1M) tenor based on an off-tenor transactions which its maturity falls between 1 Week and 1 Month tenor bucket. This is for calculating contribution for STIBOR on 2024-02-07:

STIBOR Calculation Date	**2024-02-07**
Trade Date	2024-02-06

Part 1. The input data : Following data from the panel bank is obtained:

Input Data from Panel Bank	Value	Reference/Operation
Transaction ID	TX1	(1)
Volume (SEK)	100 000 000	(2)
Transaction Rate (SEK, %)	4,0	(3)
Trade Date	2024-02-06	(3)
Settlement Date	2024-02-08	(4)
Maturity Date	2024-02-21	(5)
Tenor	Between 1 Week and 1 Month	(6)



Part 2. Implied SEK Rate Calculation : Since the transaction is denominated in SEK in this example there is no need of calculating the implied SEK rate. If the off-tenor transaction is denominated in a foreign currency, the implied SEK rate must be derived (see Level 1.2 examples for details).

Part 3. Spread Adjustment Factor Calculation: Since the transaction is denominated in SEK (no need of calcuating the implied SEK Rate). Next we need to determine the Spread Adjustment Factor (SAF) as the difference between the transaction SEK rate and a linearly interpolated individual Panel Bank's COF rate as the maturity of the off-tenor transaction accordingly:

Spread Adjustment Factor			
Variable	Value	Reference/Operation	Representation from Methodology
PB's 1 Week COF (previous day, %)	3,85	(1)	$PB^{\square}_{-,-1}$
PB's 1 Month COF (previous day, %)	3,90	(2)	$PB^{\square}_{+,-1}$
1 Week Day Count	7	(3) = (2024-02-15) – (2024-02-08)	d_-
1 Month Day Count	29	(4) = (2024-03-08) – (2024-02-08)	d_+
Transaction Day Count	13	(5) = (2024-02-21) – (2024-02-08)	d_{act}
PB's interpolated off-tenor COF (%)	3,863…	$(6) = (1) + \frac{(2) - (1) \cdot ((5) - (3))}{(4) - (3)}$	$PB^{\square}_{int,-1} = PB^{\square}_{-,-1} + \frac{(PB^{\square}_{+,-1} - PB^{\square}_{-,-1}) \cdot (d_{act} - d_-)}{d_+ - d_-}$
Transaction's SEK Rate	4,0	(7)	$r_i^{\square}$
SAF	0,136…	(8) = (7) – (6)	$SAF = r_i^{\square} - PB^{\square}_{int,-1}$

Part 4. Cost of Funds Calculation : In addition the obtained SAF is added to the previous day's individual Panel Bank's COF rate for the off-tenor transaction neighbouring STIBOR tenors which were previously used as anchors for the interpolation accordingly:

Cost of Funds (COF) Calculation			
Variable	Value	Operation/reference	
PB's 1 Week COF (previous day, %)	3,85	(1)	$PB^{\square}_{-,-1}$
PB's 1 Month COF (previous day, %)	3,90	(2)	$PB^{\square}_{+,-1}$
SAF	0,136…	(3)	
1 Week COF	3,986…	(4) = (1) + (3)	$r_{-} = PB^{\square}_{-,-1} + SAF$
1 Month COF	4,036…	(5) = (2) + (3)	$r_{+} = PB^{\square}_{+,-1} + SAF$

Part 5. Re-allocated Volumes Calculation: The notional volume of the off-tenor transaction from part 1 is divided between the two neighboring STIBOR tenors accordingly:

Re-allocated Volumes Calculation			
Variable	Value	Reference/Operation	Representation from Methodology
1 Week Day Count	7	(1) = (2024-02-15) – (2024-02-08)	d_{-}
1 Month Day Count	29	(2) = (2024-03-08) – (2024-02-08)	d_{+}
Transaction Day Count	13	(3) = (2024-02-21) – (2024-02-08)	d_i
1 Week Tenor Weight	0,727…	$(4) = \frac{\lvert(3)-(2)\rvert}{(2)-(1)}$	$\omega_{-} = \frac{\lvert d_i - d_{+}\rvert}{d_{+} - d_{-}}$
1 Month Tenor Weight	0,272…	$(5) = \frac{\lvert(3)-(1)\rvert}{(2)-(1)}$	$\omega_{+} = \frac{\lvert d_i - d_{-}\rvert}{d_{+} - d_{-}}$
Volume (SEK)	100 000 000	(6)	vol_i
1 Week Volume (SEK)	72 727 272,73	(6) * (4)	$vol_{-} = vol_i \cdot \omega_{-}$
1 Month Volume (SEK)	27 272 727,27	(6) * (5)	$vol_{+} = vol_i \cdot \omega_{+}$

Part 6. Repitition : Repeat processes from the Step 2 to Step 3 for all remaining transactions from the Step 1. As we have no other transactions in our example, we skip this step.

Part 7. Volume Weighted Average (VWA) Cost of Funds (COF) Calculation : The volume weighted average Cost of Funds is calculated and rounded to three decimals accordingly:

Volume Weighted Average (VWA) Cost of Funds (COF)			
Variable	Value	Operation	Equations From Calculation Methodology
1 Week Volume (SEK)	72 727 272,73	(1)	$vol_i^{\square}$
1 Week COF	3,986…	(2)	$r_i^{\square}$
1 Month Volume (SEK)	27 272 727,27	(3)	$vol_i^{\square}$
1 Month COF	4,036…	(4)	$r_i^{\square}$
VWA 1 Week COF (%)	3,986	$(5) = \frac{(2) * (1)}{(1)}$	$WVA = \frac{\sum_{i=1}^{n}\left(r_i^{\square} \cdot vol_i^{\square}\right)}{\sum_{i=1}^{n} vol_i^{\square}}$
VWA 1 Month COF (%)	4,036	$(6) = \frac{(4) * (3)}{(3)}$	$WVA = \frac{\sum_{i=1}^{n}\left(r_i^{\square} \cdot vol_i^{\square}\right)}{\sum_{i=1}^{n} vol_i^{\square}}$

Part 8. Bid to Offer Spread (BOS) : A default Bid to Offer Spread (BOS) is added to the Level 2.1 COF from the Part 4 to derive Level 2.2 contribution for 1M tenor. The BOS is either automatically applied by the STIBOR calculation system – default BOS in this case 15 basis points (0.15) for 1M Tenor or altered BOS is provided by a Panel Bank under specific scenarios.

Bid to Offer Spread adjustment (BOS)		
Variable	Value	Reference/Operation
VWA 1 Week	3,986	(1)
Default BOS	0,10	(2)
Level 2.2 Contribution (%)	4,086	(3) = (1) + (2)
VWA 1 Month	4,036	(1)
Default BOS	0,15	(2)
Level 2.2 Contribution (%)	4,186	(3) = (1) + (2)

Level 2.3: Historical Transactions

Level 2.3 applies only to the 1 month, 2 months, 3 months and 6 months tenors and it is applied only in cases in which a COF rate could not be derived from any of the previous methodological levels in the designated hierachy. Level 2.3 applies solely to transactions in any of the eligible foreign currencies[4] that have been previously used in the calculation of Level 1 COF rates.

Example 2.3 Historical USD Transaction

The following is an example of Level 2.3 contribution for the 6 Months (6M) tenor for the STIBOR calculation on 2024-02-06:

STIBOR Calculation Date	**2024-02-07**
Trade Date	2024-02-06

Part 1. The input data : The following date from the panel bank's historical transaction used for a Level 1.2 contribution for the STIBOR calculation on 2024-02-01 is obtained:

Input Data from Panel Bank	Value	Reference/Operation
Transaction ID	TX1	(1)
Volume (USD)	10 000 000	(2)
Transaction Rate (USD, %)	5,0	(3)
Trade Date	2024-01-31	(3)
Settlement Date	2024-02-02	(4)
Maturity Date	2024-08-02	(5)
Tenor	6 Months	(6)

Part 2. The Market Adjustment Factor (MAF) Calculation : The MAF of the transaction from is calculated based on daily changes in a representative instrument for the currency underlying the original transaction (in this case, 6 Months ICE Term SOFR Reference Rates) between the trade date of the original transaction (2024-01-31, date T-d) and day T (2024-02-05), with respect to the STIBOR calculation day on T+1 (2024-02-06). Finally, the MAF is added to the original transaction USD rate accordingly:

Market Adjustment Factor (MAF)				
Variable	Value	Operation/Reference	Trade Date	Representation from Methodology
ICE Term SOFR 6M (%)	5,2072	(1)	2024-02-06	T_0^{USD}
ICE Term SOFR 6M (%)	5,08499	(2)	2024-01-31	T_{-d}^{USD}
MAF	0,122…	(3) = (1) – (2)		$MAF = T_0^{USD} - T_{-d}^{USD}$
Transaction Rate (USD, %)	5,0	(4)		$r_i^{\square}$
Transaction Rate (USD, %) + MAF	5,122…	(5) = (3) + (4)		$r_i^{adj} = r_i^{\square} + MAF$

[4] Historical SEK denominated transactions are not considered eligible under Level 2.3 due to lack of an appropriate market adjustment factor for moves in Swedish rates that fulfils the necessary criteria regarding transparency and verifiability.

Part 3. Forward Rate Calculation: To calculate the implied SEK rate for the historical transaction ID TX1 (see Level 1.2 examples for details) using the MAF-adjusted original transaction USD rate from Part 2, the forward rate needs to be calculated. The forward rate for the implied SEK rate calculation treats the historical transaction as if it was a L1.2 transaction traded on day T, with respect to the STIBOR calculation day on T+1, at the MAF-adjusted rate, matching the historical transaction's duration and settlement date (i.e., T+0, T+1, or T+2). Thus, the transaction matches the exact same days as the 6 months forward points duration, the forward rate calculation follows accordingly:

Forward Rate Calculation		
Input/Calculated Data from External Data Source	Value	Reference/Operation
Trade Date	2024-02-06	(1)
Spot Rate, USD to SEK	10,55985	(2)
Forward Points, 6 Months USD/SEK	-0,073504	(3)
Forward Rate	10,486…	(4) = (2) + (3)

Notice that this part looks different based on the nature of the transaction denominated in foreign currency.

Part 4. Implied SEK Rate Calculation : The obtained spot rate and forward rate is used to calculate the implied SEK rate for the historical transaction accordingly:

Implied SEK Rate Calculation			
Variable	Value	Operation/Reference	Representation From Calculation Methodology
Trade Date			
Original Transaction Rate (%) + MAF	5,122…	(1)	r_i^{adj}
Spot Rate	10,55985	(2)	S_{FCY}^{SEK}
Forward Rate	10,486…	(3)	F_{FCY}^{SEK}
Transaction Day Count	182	(4) = (2024-08-02) – (2024-02-02)	Act = (Maturity Date – Settlement Date)
Std. Year length for USD Rate	360	(5)	Y_{FCY}
Std. Year length for SEK Rate	360	(6)	Y_{SEK}
Implied SEK rate (%)	3,709…	$(7) = \left(\frac{(3)}{(2)}\left(1 + \frac{(1)}{100}\frac{(4)}{(5)}\right) - 1\right)\frac{(6)}{(4)}$	$r_i^{SEK} = \left(\frac{F_{FCY}^{SEK}}{S_{FCY}^{SEK}}\left(1 + r_i^{adj}\frac{Act}{Y_{FCY}}\right) - 1\right)\frac{Y_{SEK}}{Act}$

Part 5. Repitition : Repeat the process from Part 1 to Part 4 for all remaining transactions from Part 1. In this case, there is only one transaction.

Part 6. Volume Weighted Average (VWA) Cost of Funds (COF) Calculation : The VWA COF is calculated from all implied SEK rates derived in the previous steps and the trade volumes from Step 1 converted into the SEK equivalent as the corresponding weights. The VWA COF is rounded to three decimal places and calculated in this example accordingly:

Volume Weighted Average (VWA) Cost of Funds (COF)			
Variable	Value	Reference/Operation	Representation From Calculation Methodology
Transaction Volume (USD)	10 000 000	(1)	vol_i^{FCY}
Spot Rate	10,55985	(2)	S_{FCY}^{SEK}
Transaction Volume (SEK)	105 598 500	(3) = (1) * (2)	$vol_i^{SEK} = vol_i^{FCY} \cdot S_{FCY}^{SEK}$
Implied SEK Rate (%)	3,709…	(4)	r_i^{SEK}
VWA 6 Month COF (%)	3,710	$(5) = \frac{(4) * (3)}{(3)}$	$WVA = \frac{\sum_{i=1}^{n}(r_i^{SEK} \cdot vol_i^{SEK})}{\sum_{i=1}^{n} vol_i^{SEK}}$

Part 7. Bid to Offer Spread adjustment (BOS): A default BOS is added to the Level 2.3 COF from Part 4 to derive Level 2.1 contribution for 6M tenor. The BOS is either automatically applied by the STIBOR calculation system – default BOS in this case 15 basis points (0.15) for 6M Tenor or altered BOS is provided by a Panel Bank under specific scenarios.

Bid to Offer Spread (BOS) Adjustment		
Variable	Value	Reference/Operation
VWA 6 Month COF (%)	3,710	(1)
Default BOS	0,15	(2)
Level 2.3 Contribution (%)	3,860	(3) = (1) + (2)

Level 3 Cost of Funds Calculation

Level 3 Cost of funds (COF) rates are required where a Panel Bank's COF rate for a STIBOR tenor cannot be calculated automatically using either Level 1 or Level 2 of the STIBOR Calculation Methodology.

Level 3 COF rate should reflect the Panel Bank's estimated cost of funds for day T (the day preceding the calculation and publication of STIBOR);

For the determination of Level 3 COF contribution, Panel Bank's shall take into consideration their short-term wholesale funding strategy, in particular their reliance on local currency (SEK) and derived SEK produced from foreign currency. Detailed guidance for Panel Banks' is provided in the STIBOR Panel Bank Code of Conduct document.