Framework for the transaction-based reference rate

SWESTR

SVERIGES RIKSBANK

Contents

1 The Riksbank as administrator of SWESTR

Pursuant to Chapter 1, Section 12 of the Sveriges Riksbank Act (2022:1568), the Riksbank may provide and publish reference values in accordance with the Benchmark Regulation (BMR)[1].

With the above legal support, this framework describes how the Riksbank carries out its administration of the Riksbank's transaction-based reference rate Swedish krona Short Term Rate (SWESTR) and of average interest rates and the index based on SWESTR. The framework describes how the Riksbank determines, provides and controls SWESTR. The Instructions for Sveriges Riksbank specify the division of responsibilities between the relevant departments at the Riksbank with regard to SWESTR, while the Executive Board of the Riksbank is responsible for all decisions of principle regarding SWESTR.

SWESTR is a reference rate for the shortest maturity calculated by the Riksbank on the basis of transactions carried out in Swedish kronor from the relevant banking day to the next, overnight (O/N), and reported to the Riksbank by major actors in the money market. The transactions are made between the reporter and banks, the Swedish National Debt Office, financial institutions or non-financial corporations.

In addition to SWESTR O/N, the Riksbank also provides average interest rates for time periods of 1 week, 1 month, 2 months, 3 months and 6 months, based on the fixed SWESTR values. The Riksbank also provides an index based on the SWESTR values. Consequently, the Riksbank is also the administrator of these average interest rates and the index.

SWESTR can be used, among other things, as a benchmark, or base value, for pricing financial contracts, such as interest-rate derivatives, FX derivatives and interest-bearing securities. SWESTR can also be used for pricing loans at variable interest rates.

Unless otherwise expressly stated, the term SWESTR in this framework document shall refer both to SWESTR and to average rates and indices based on SWESTR.

1.1 Application of the IOSCO Principles

In common with other central banks that issue reference rates, the Riksbank complies, where applicable and relevant, with the principles for financial reference rates adopted by the International Organisation of Securities Commissions (IOSCO).[2] The principles aim to help to promote reliability, good governance, control, transparency and quality in the setting of reference rates.

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[1] Regulation (EU) no. 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of mutual funds and amending Directives 2008/48/EC and 2014/17/EU and Regulation (EU) No 596/2014.

[2] Principles for Financial Benchmarks, IOSCO, July 2013.

SWESTR is calculated on the basis of transactions that are representative of the overnight market in Swedish kronor. This market is a liquid and competitive market that meets the applicable IOSCO principles for reference rates, and thus constitutes the underlying market for SWESTR.

In accordance with the IOSCO principles, SWESTR is subject to regular evaluation by the Riksbank. This evaluation includes the underlying market and whether the calculation method for SWESTR accurately reflects the activity in this market. The process of identification and publication is also subject to regular review.

SWESTR should also be well anchored among the market participants using the reference rate, and the Riksbank has therefore set up the SWESTR Advisory Group as support.[3]

1.2   Governance arrangements

The Riksbank shall ensure that there is good internal governance and control for SWESTR. This is implemented through (i) a robust internal framework that governs roles and responsibilities, conflict of interest management, risk prevention and business continuity planning, and (ii) this framework, which sets out the processes for determining and publishing SWESTR.

1.3   Definitions

Terms used in this framework are defined below.

Administrator – a natural or legal person that controls the issuance of a reference rate. Sveriges Riksbank is administrator of SWESTR.

Alternative calculation method – The calculation method for SWESTR that is to be used in the event that a normal calculation method cannot be used; see Section 2.5.

Business day – Day on which the RIX payment system is open for transactions, normally non-holiday weekdays (Monday-Friday).

Daily process – The daily process for determining and publishing SWESTR and average rates and index based on SWESTR, see Sections 3-4.

Accrual – Change in value due to return with a certain interest rate.

Average rates and index based on SWESTR – Backward-looking compounded average rates for specified time periods (1 week, 1 month, 2 months, 3 months and 6 months) and compounded index based on the determined values for SWESTR that reflect the yield from cumulative accrual with SWESTR.

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[3] Read more about SWESTR's Advisory Group on the Riksbank's website.

Normal calculation method – The calculation method for SWESTR that is to be used under normal circumstances; see Section 3.5.

Reporter - Monetary policy counterparty that reports data on its executed money market transactions to the Riksbank on a daily basis, see *Terms and Conditions for RIX and monetary policy instruments*.

SWESTR – Swedish krona Short Term Rate, which is a transaction-based reference rate in Swedish kronor for the very shortest maturity.

Trimming – Arranging the individual transactions in the transaction dataset according to their respective rate levels and then excluding symmetrical percentages of the total transaction volume with the lowest and highest rates from further calculations.

Underlying market – the market a reference rate is intended to reflect. The reference rate shall accurately reflect the underlying market.

Validate - To confirm that the reported transaction data is correct.

Value day – Day to which the reference **value** refers. The value day for SWESTR is the day upon which the underlying transactions are executed. The value day for average rates and index corresponds to the publication day.

2 Methodology for determining SWESTR

2.1 Underlying market and transaction dataset

Underlying market

The underlying market for SWESTR shall be the overnight market in Swedish kronor.

Data source for SWESTR

The data forming the basis for the calculation of SWESTR shall comprise the transaction reporting submitted by the Riksbank's monetary policy counterparties in accordance with the Riksbank's *Terms and Conditions for RIX and Monetary Policy Instruments*.

Day count convention

Transactions are reported with the daily calculation convention actual number of days through 360.

Current transactions

Transactions that meet the following requirements shall be included in the transaction dataset for SWESTR:

- unsecured deposits received by the monetary policy counterparty,
- have an overnight maturity,
- have a volume of at least SEK 10 million, and
- are executed between the monetary policy counterparty and an agent belonging to one of the following counterparty categories[4]:
    - banks and financial institutions (S122-S129),[5]
    - non-financial companies (S11), or
    - Swedish National Debt Office (NDO).

The breakdown into counterparty categories shall follow the standard of the European System of Accounts (ESA2010). The classification shall be based on information about the Legal Entity Identifier (LEI code) that monetary policy counterparties shall provide.[6]

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[4] The following so-called S-codes follow Statistics Sweden's classification structure, the Swedish Standard Industrial Classification.

[5] Intra-group transactions with the reporters shall not be included in the dataset for SWESTR. The terms 'group' and 'intra-group transaction' are defined as in Regulation ECB/2014/48.

[6] If the monetary policy counterparty cannot provide the LEI code for its counterparty, a sector code according to ESA2010 shall instead be specified. In these instances, the transaction shall be classified according to the sector code.

Data processing for verification and validation

To ensure the quality of the reported data forming the basis for the calculation of SWESTR, the Riksbank applies automatic checks aimed at identifying transactions suspected of being unintentionally and/or intentionally incorrectly reported. In cases where the automatic checks identify a transaction as potentially incorrectly reported, it shall only be used in the calculation of SWESTR if, and only if, the reporter confirms ("validates") that it is correctly reported.

Requirements for robustness and choice of calculation method

To ensure that the transaction dataset is robust and to reduce the risk of manipulation, the following requirements for robustness are applied:

- the total transaction volume shall be at least SEK 2 billion,
- at least three reporters shall have reported transactions to the transaction dataset,
- no single reporter shall account for more than 75 per cent of the total transaction volume.

The robustness requirements refer to the transaction dataset before trimming in accordance with Section 2.2.1. If all requirements for robustness are fulfilled, the normal calculation method according to Section 2.2.2 shall be used. If any of the requirements for robustness are not fulfilled or if the transaction dataset is not available, for example due to technical error, alternative calculation methods according to Section 2.2.3 shall be used.

2.2 Calculation method

2.2.1 Trimming

To reduce the impact of any extreme values, the transaction dataset shall be trimmed before calculating SWESTR. A total of 25 per cent of the transaction volume shall be excluded from further calculations, allocated as follows:

- 12.5 per cent of the transaction volume with the lowest interest rates
- 12.5 per cent of the transaction volume with the highest interest rates

SWESTR shall thus be calculated on the basis of the middle 75 per cent of the transaction volume in terms of the interest rates of the transactions.

2.2.2 Normal calculation method

Normal calculation method refers to a volume-weighted average of the interest rates in the trimmed dataset.

SWESTR with value date i is calculated using the following formula:

$$Swestr_i = \sum_{k=1}^{N_i} \frac{v_k}{V_i} r_k$$

where:

k = an index representing each transaction in the trimmed transaction dataset for value day i

N_i = the number of transactions in the trimmed transaction dataset for value date i

r_k = interest rate for transaction k

v_k = volume of transaction k

V_i = total transaction volume in the trimmed dataset for value date i

2.2.3 Alternative calculation method

An alternative calculation method shall be used in the event of deviations in the process of determination if the current calculation base is not available, for example in case of technical error, or if the current transaction base is available but does not fulfil all robustness requirements. The following method implies that the previous value date's value will be used in case of days without transaction datasets.

$$Swestr_i^{Alt} = R_i + \sum_{k=0}^{1} \alpha_{i-k}(Swestr_{i-k} - R_{i-k})$$

Where:

i = an index representing the current value day for calculation.

k = an index representing each value date for SWESTR

$$Swestr_{i-k} = \begin{cases} Swestr_{i-k} \ ber\ddot{a}knad \ enligt \ normal \ ber\ddot{a}kningsmetod, \ k = 0 \\ fastst\ddot{a}lld \ Swestrnotering \ f\ddot{o}r \ v\ddot{a}rdedag \ i - k, \ k > 0 \end{cases}$$

R_{i-k} = the Riksbank's policy rate for business day $i - k$

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$\alpha_{i-k} = \frac{v_{i-k}}{V} \in [0,1]$ is the weight of each value

v_{i-k} = volume for value day $i - k$, see below how these are determined

$V = v_{i-1} + v_i$, total volume for the value days $i - 1$ and i

where v_i is the transaction volume for value day i while v_{i-1} is determined as follows:

v_{i-1} = weight after sequential weighing to fulfil the robustness requirements for value day i. The following sequence applies:

1. $v_{Rapp,i} = \begin{cases} v_i \left(\frac{3 - Antal\ rapport\ddot{o}rer_i}{Antal\ rapport\ddot{o}rer_i} \right), & 0 < Antal\ rapport\ddot{o}rer < 3 \\ 0, & Antal\ rapport\ddot{o}rer \geq 3 \end{cases}$

2. $v_{Konc,i} = \begin{cases} \frac{4}{3} v_{Max,i} - (v_i + v_{Rapp,i}), & \frac{v_{Max,i}}{v_i + v_{Rapp,i}} > \frac{3}{4} \\ 0, & \frac{v_{Max,i}}{v_i + v_{Rapp,i}} \leq \frac{3}{4} \end{cases}$

   where $v_{Max,i}$ is the volume of the largest reporter value day i.

3. $v_{Vol,i} = \begin{cases} 2mdr - (v_i + v_{Rapp,i} + v_{Konc,i}), & v_i + v_{Rapp,i} + v_{Konc,i} < 2mdr \\ 0, & v_i + v_{Rapp,i} + v_{Konc,i} \geq 2mdr \end{cases}$

$v_{i-1} = v_{Rapp,i} + v_{Konc,i} + v_{Vol,i}$

Special cases when no transactions exist, for example due to a technical error, $\alpha_{i-1} = 1$ and $\alpha_i = 0$ are set, i.e. the Riksbank reuses the previous value date entry.

2.2.4 Special case for the first business day of the year

For i = the first business day of the year, $i - 1$ refers to the penultimate business day of the previous year.

2.3 Calculation

Calculation of SWESTR shall be carried out at 08:30 on the eve of the regular publication of SWESTR in accordance with Section 4.2 ("first calculation time").

A further calculation shall be carried out at 11:30 to examine whether the determination of a corrected SWESTR in accordance with section 4.2 is appropriate ('second calculation time')

After calculation, a reasonable assessment of the calculation result shall be made in the light of the transaction dataset in question.

2.4 Determination of a corrected SWESTR

If the difference between the calculation result at the second calculation and the value determined after the first calculation for SWESTR exceeds 0.02 percentage points, a corrected value for SWESTR shall be determined. Such a corrected value may be relevant, for example, in the event of late reporting or validation of transaction data, or in the event of an earlier technical error or other type of administrator error.

A corrected SWESTR value shall replace the previous value as the determined value for SWESTR on the business day in question.

After the publication time of the corrected SWESTR pursuant to Section 4.2, no new value for SWESTR can be determined, regardless of new or changed transaction data.

If a corrected SWESTR value has been determined, this will be communicated on the Riksbank's website.[7] The value is also updated in the API provided for SWESTR, see Section 4.

After the publication time of the corrected SWESTR, no new value for SWESTR will be determined, regardless of new or changed transaction data.

2.5 Rounding

Any rounding of the calculated value for SWESTR shall be made as late as possible before determination and shall comply with established mathematical principles for rounding.[8]

2.6 Procedures for problems when reporting

If the Riksbank has not published a value for SWESTR by 12 noon on the publication date, a value corresponding to the previous day's SWESTR value will be applied, adjusted for any changes in the Riksbank's policy rate. This corresponds to the value that would have been determined for SWESTR using an alternative method in the event of a technical error.

In the event of a lack of transaction data for more than one day, the Riksbank will publish a SWESTR value using a method adapted to the prevailing conditions and communicate this.

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[7] The information on the value is updated automatically on the main SWESTR page and the publication time for the value is changed to 12.00. This time applies as from the SWESTR value for value date 28 April 2023. 14.00 applies before that.

[8] Established mathematical principles refer to rounding away from zero, that is, 0.0055 is rounded to 0.006 and -0.0055 is rounded to -0.006.

3 Methodology for determining average interest rates and index

3.1 Design

The central provisions of the methodology and the process for determining average rates and index based on SWESTR are set down in this section. The design and calculation methods shall follow international practice and reflect the market conventions used in the money market in Swedish kronor.

3.2 Provision

The Riksbank shall provide average rates and an index based on SWESTR. These shall be backward-looking and cumulative. They shall be based solely on the determined values for SWESTR and shall reflect a continuous accrual of SWESTR.

Average rates based on SWESTR shall be provided for the time periods of 1 week and 1, 2, 3 and 6 months. In addition, an index allows a simple calculation of an average rate for SWESTR over a period between any two business days.

The calculated average rates and index are provisional until SWESTR has been published according to Section 4.2. Any calculations of adjusted average interest rates and index are published in accordance with 4.2.

3.3 Method of calculation and market conventions

3.3.1 Day count convention

The 360-day count convention is applied for the calculation of the average rates and index.

3.3.2 Average rates

The periods for average rates are determined backward-looking on the basis of the period's end date and the date of publication of the average interest rate.

The first day of the period for which an average rate is calculated is termed the period's starting date, $t = 0$. According to market convention, the interest rate is calculated from the period's starting date to its end date (exclusive).

In case the calculated starting date is not a business day:

- for the period 1 week, the adjustment principle *(standard) preceding business day*, i.e. the starting date is brought forward to the immediately preceding banking day,

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- for other time periods, the adjustment principle *modified preceding business day* is applied, i.e. the starting date is brought forward to the immediately preceding banking day, as long as this does not mean that the starting date is in another month, in which case the starting date is instead postponed. The average rate with value day *I* is calculated using the following formula:

$$Genomsnittsränta_i = \left[\prod_{t=1}^{i}\left(1 + \frac{r_t \times n_t}{360}\right) - 1\right] \times \frac{360}{d_c}$$

where:

t = an index representing each business day of the period beginning with $t = 0$ and ending with value date i

r_t = SWESTR value <u>published</u> on business day t, i.e. $r_t = Swestr_{t-1}$

n_t = number of calendar days for which rate r_t is applicable

d_c = number of calendar days in the interest period

n_t is generally 1, except for Mondays when it is 3, to take account of accrual over the weekend, or where adjustments are needed to take account of non-business days

3.3.3 Index

Index for SWESTR with value day *I* is calculated using the following formula:

$$Index_i = \begin{cases} 100, \text{ om } i = 0 \\ 100 \times \prod_{t=1}^{i}\left(1 + \frac{r_t \times n_t}{360}\right), \text{ om } i > 0 \end{cases}$$

where:

t = an index representing each business day since $t = 0$

r_t = SWESTR value <u>published</u> on business day t, i.e. $r_t = Swestr_{t-1}$

n_t = number of calendar days for which rate r_t is applicable

$t = 0$ refers to 1 September 2021

n_t is generally 1, except for Mondays when it is 3, to take account of accrual over the weekend, or where adjustments are needed to take account of non-business days

3.3.4 Agreement between index and average rates

The average rate for a period from any business day x to any other business day y can be calculated using index values:

$$\left(\frac{Index_y}{Index_x} - 1\right) \times \frac{360}{d_c}$$

where:

d_c = number of calendar days in the interest period, i.e. $y - x$

$Index_i$ = SWESTR index with value date i

3.4 Rounding

Any rounding off shall be done as late as possible before publication and shall follow established mathematical principles for rounding off.[9]

3.5 Determination of corrected average rates and index

Corrected values for average rates and index shall be determined if, and only if, a corrected value for SWESTR has been determined or an error in the calculation has been detected. In this case, these corrected values replace the former as determined values.

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[9] Established mathematical principles refer to rounding away from zero, that is, 0.0055 is rounded to 0.006 and -0.0055 is rounded to -0.006.

4 Publication

4.1 Publishing tools

The Riksbank's website

The official publication of SWESTR and the publication of average interest rates and index based on SWESTR are published on the Riksbank's website.

API

The information is also published in the application programming interfaces (API) provided by the Riksbank for these purposes.

If the published SWESTR value for the same banking day differs between the Riksbank's website and the API, the publication on the website will apply as the official value.

4.2 Publication time

SWESTR[10]

SWESTR will be published every Swedish banking day at 09:00.

A possible corrected value for SWESTR shall be published at 12.00.

Average rates and index[11]

Average rates and an index based on SWESTR shall be published every Swedish banking day at 09:05.

Any corrected values for average rates and index will be published at 12:05.

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[10] The above times apply as from the SWESTR value for value date 28 April 2023. 11.00 and 14.00 respectively apply before that.

[11] The above times apply as from the values for average rates and index for value date 2 May 2023. 11.05 and 14.05 respectively apply before that.

4.3 Publication format

4.3.1 SWESTR

SWESTR shall be published as a percentage to three decimal places. In addition to the rate value, the following information about the transaction data shall be published:[12]

- total volume, SEK millions,
- number of transactions,
- number of reporters that have reported transactions,
- the rate level at the upper trimming limit, as well as the rate level at the 87.5 percentile of the transaction volume (as a percentage to two decimal places), and
- the rate level at the lower trimming limit, as well as the rate level at the 12.5 percentile of the transaction volume (as a percentage to two decimal places).

The published information shall relate to the transaction dataset prior to trimming.

If a corrected value for SWESTR is determined, corrected information on the transaction dataset shall also be published. Information on the calculation method – alternative or normal – used shall also be provided. If an alternative calculation method has been used, summary information about the reason for this shall be published, but otherwise no information about the transaction dataset shall be published for the relevant value date.

4.3.2 Average rates and index

Average rates for SWESTR shall be published as a percentage to five decimal places. For each average rate, the starting date of the period to which the rate relates shall also be published.

The index for SWESTR shall be published in decimal format to eight decimal places. The starting date (1 September 2021) has an index value of 100.

4.4 Value date

SWESTR

The value date for SWESTR is the day upon which the underlying transactions were executed and settled. SWESTR is published with a time lag of one banking day.

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[12] The rate levels at the trimming limits are published daily as from the SWESTR value for value date 31 March 2023. In close connection to the publication of this value, information on equivalent rate levels for all SWESTR values already published will be presented.

Average rates and index

The average rates and index shall have their value date on the same day as the publication date, and include the information in the SWESTR value published on the same day.

4.5 Conditions for use and re-publication

The Riksbank shall publish information for use and re-publication of SWESTR, including average rates and index based on SWESTR, on the Riksbank's website. This shall include information on what applies when using SWESTR and when operators choose to re-publish SWESTR in their information systems and platforms.

Swestr/SWESTR is a registered trade mark. The Riksbank will monitor possible trade mark infringements.

5 Evaluation and follow-up

5.1 Monitoring Forum for SWESTR

The Riksbank's internal oversight function for SWESTR is conducted in the form of an interdepartmental forum, which primarily ensures that the Riksbank fulfils all of the IOSCO criteria applicable and relevant to SWESTR. The activities are regulated in the *SWESTR Supervisory Forum Rule*.

5.2 Transaction dataset report for SWESTR

On a quarterly basis and with a time lag, the Riksbank shall publish a *Report on the transaction dataset for SWESTR*, with information on any changes in the transaction dataset and information on the composition of the transaction dataset.

5.3 Annual evaluation

The Riksbank shall annually monitor SWESTR and average interest rates and index to ensure that SWESTR fulfils the relevant IOSCO principles. This internal evaluation aims to identify the need for changes to the SWESTR transaction-based reference rate framework.

A subset of the information from the annual evaluation shall be presented in an externally published report *(SWESTR Annual Report)* which, taking into account confidentiality provisions, shall be of a descriptive nature.

5.4 Annual certification of compliance with the IOSCO principles

Based on the annual evaluation in section 5.3, the Riksbank shall publish an annual Statement of Compliance on the Riksbank's website.

5.5 SWESTR Advisory Group

The SWESTR Advisory Group shall be used as a channel for obtaining information for the evaluations and follow-ups carried out by the Riksbank and is governed by the *Description of the SWESTR Advisory Group*, which can be found on the Riksbank's website.

The group consists of representatives for users of SWESTR and representatives from participants who are active in the overnight market, as well as other relevant agents. Participation in the group is voluntary.

6 Questions, comments and complaints

6.1 Questions and comments

Questions and comments regarding SWESTR can be sent to swestr@riksbank.se.

6.2 Complaints

The Riksbank provides a formal channel for complaints concerning SWESTR. Complaints may be sent either by physical letter or by e-mail.

Physical letter

Sveriges Riksbank
SE 103 37 Stockholm
Please state "Complaint SWESTR" on the letter

E-mail

Please use the e-mail address swestr.klagomal@riksbank.se
Please state "Complaint SWESTR" in the subject line

Handling of complaints

The Riksbank handles complaints received in accordance with current legislation and the Riksbank's internal regulations. This means, among other things, that employees who are the subject of the complaint will not be involved in the complaint handling process.

6.3 Reporting anomalies

The Riksbank provides an internal reporting channel for whistleblowing. Through this channel, Riksbank staff can anonymously report any anomalies, for example with regard to SWESTR.

7 Revision history of the document

Tabell 1. Revision history

Revisions of *SWESTR: Comprehensive information on the SWESTR transaction-based reference rate framework.*

Decision date	Publication date	Document registration number (dnr)	Revisions
26 May 2025	05 June 2025	2025-00682	Original version of the document.