



Information document

SWESTR

Comprehensive information on Sveriges
Riksbank's framework for SWESTR

September 2024

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1 The Riksbank as administrator of SWESTR

In accordance with Chapter 1, Section 12 of the Sveriges Riksbank Act (2022:1568), the Riksbank may provide and publish such financial benchmarks as referenced in the European Benchmark Regulation.¹

1.1 SWESTR

Sveriges Riksbank determines, provides and controls the reference rate Swedish krona Short Term Rate (SWESTR). This means that the Riksbank is administrator of 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. SWESTR is a fully transaction-based reference rate on the shortest maturity in Swedish kronor and is thus a reference rate as defined in the Benchmark Regulation.

The Riksbank also provides compounded average rates for periods of 1 week, 1 month, 2 months, 3 months and 6 months, which are based on the determined values for SWESTR, and is consequently also the administrator of these average interest rates. The Riksbank also provides an index based on the SWESTR values.

The Riksbank publishes SWESTR and compounded average rates plus the index every banking day.

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 information document shall refer to SWESTR as well as average rates and index based on SWESTR.

1.2 1.2 Regulations of principle

Like the other central banks that provide reference rates, the Riksbank complies, where applicable and relevant, with the principles for financial benchmarks adopted by the International Organisation of Securities Commissions (IOSCO).² The IOSCO principles were drawn up to increase the reliability of reference rates and contribute to good governance, control, transparency and quality in the determination of

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 investment 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.

reference rates. The principles specify the arrangements that an administrator should have in place and represent the international standard for how an administrator should conduct the work regarding reference rates.

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

In accordance with the IOSCO principles, SWESTR will be subject to regular evaluation. This evaluation will include the underlying market and whether the calculation method accurately reflects the activity in this market. The process of identification and publication will also be 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. This group can also help to facilitate the Riksbank's information gathering for following up SWESTR.³

1.3 Governance arrangements

The Riksbank ensures good internal governance for SWESTR through:

- a robust internal regulatory framework, including the necessary governing documents for SWESTR, with clear roles and responsibilities,
- well documented internal routine descriptions of the process of determining and publishing SWESTR,
- established processes for identifying and managing conflicts of interest related to SWESTR, and
- conducting active and systematic risk prevention work, including continuity planning.

1.4 Organisation

1.4.1 Executive Board

The Executive Board of the Riksbank makes important decisions of principle regarding SWESTR, such as the overall organisation and basic rules for the process of determining and publishing SWESTR. The Board also decides on the design of SWESTR and the compounded average interest rates and index.

1.4.2 Markets Department

The Markets Department has the overall responsibility for operationalising the Riksbank's role as administrator.

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

1.4.3 Monetary Policy Department

The Statistics Division at the Monetary Policy Department performs the process applied each banking day to determine and publish SWESTR.

1.4.4 Financial Stability Department

The Financial Stability Department (AFS) is responsible for the Riksbank's internal oversight of SWESTR.

The oversight is carried out in a committee consisting of members from different parts of the Riksbank's organisation. The oversight committee follows up and oversees compliance with all of the IOSCO principles applicable to SWESTR.

1.4.5 The IT and Digitalisation Department

The IT and Digitalisation Department is responsible, together with the Riksbank's IT operations provider, for the development, maintenance and operation of system support for SWESTR.

1.5 Transparency

Among other things, the Riksbank applies the following measures to achieve as much transparency as possible with regard to SWESTR.

Methodology and governing documents

The Riksbank publishes information on methodology and current processes on the Riksbank's website and publishes relevant governing documents.

SWESTR, average rates and index

The Riksbank publishes values for SWESTR, average rates and indices on the Riksbank's website each Swedish banking day. In addition, overall information about the transaction dataset is published. Otherwise, the Riksbank does not comment on the daily values for SWESTR.

Transaction dataset report for SWESTR

In this report, the Riksbank publishes quarterly, and with a time lag, information on how any changes in the transaction dataset, which have subsequently come to the Riksbank's attention, would have affected the SWESTR values if the changes had been known when the respective SWESTR value was determined. The report has the nature of a summary and includes days when the absolute value of the impact on SWESTR exceeds 0.001 percentage points (0.1 basis points).

The report also contains summary information about the composition of the transaction dataset. The distribution by type of counterparty to the reporters and by

size of underlying transaction is presented. This type of information will be presented for the first time in the report for the first calendar quarter of 2023.

Annual report for SWESTR

Going forward, the Riksbank will also publish an annual report for SWESTR. The first report will be for the 2023 calendar year.

1.6 Evaluation and follow-up

In accordance with the IOSCO principles, the Riksbank will evaluate and follow up the design of SWESTR and the Riksbank's work in other respects regarding SWESTR.

The Riksbank annually certifies that the Riksbank complies with the IOSCO principles in applicable and relevant parts by publishing a statement on SWESTR's compliance, known as the statement of compliance.

2 Methodology for determining SWESTR

2.1 Underlying market

The underlying market for SWESTR is the overnight market in Swedish kronor.

2.2 Transaction dataset

Data source for SWESTR

The data source for SWESTR is the daily reporting of short money market transactions that the Riksbank's monetary policy counterparties are required to make.⁴ Transactions from nine banks are currently used for SWESTR.

More information on the reporting can be found in the instructions provided by the Riksbank for this purpose. The reporting instructions are available on the Riksbank's website.

Day count convention

Transactions are reported with the day count convention actual number of days through 360.

Current transactions

The transactions that form the basis of SWESTR are those that:

- have been executed in Swedish kronor,
- have a volume of at least SEK 10 million,
- have the maturity overnight (O/N), i.e. from the transaction date to the next banking day,
- lead to unsecured deposits received by the reporting monetary policy counterparty,
- are made with a counterparty from one of the following categories:
 - banks and financial institutions (S122-S129),
 - non-financial corporations (S11) or
 - the Swedish National Debt Office.

Intra-group transactions are not included in the transaction dataset.⁵

⁴ The Riksbank's monetary policy counterparties are the participants who have access to the Riksbank's monetary policy instruments. More information about the Riksbank's monetary policy counterparties can be found on the Riksbank's website.

⁵ The terms 'group' and 'intra-group transaction' are defined as in Regulation ECB/2014/48.

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

2.3 Data processing

Checks 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 is used in the calculation of SWESTR if, and only if, the reporter confirms (“validates”) that it is correctly reported.

2.4 Robustness requirements

In order for the transaction dataset to be considered sufficiently robust:

- the transaction dataset must amount to at least SEK 2 billion,
- at least three reporting agents must have reported transactions, and
- no single reporting agent must account for more than 75% of the total transaction volume.

The robustness requirements relate to the transaction dataset before trimming.

Normal calculation method is used if the transaction dataset is considered sufficiently robust. If one of the robustness requirements is not met or the transaction dataset is not available, for example due to technical error, SWESTR is calculated using an alternative calculation method.

⁶ If the monetary policy counterparty cannot provide an LEI for its counterparty, a sector code according to ESA2010 shall instead be provided by the reporting agent. In these instances, the transaction is classified according to the sector code.

2.5 Calculation

2.5.1 Trimming

Before calculating SWESTR, the Riksbank trims the transaction dataset in order to reduce the impact of extreme values.⁷

A total of 25 per cent of the transaction volume shall be excluded from further calculations:

- 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 is thus calculated on the basis of the middle 75 per cent of the transaction volume.

2.5.2 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 date i

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

r_k = interest rate for transaction k

v_k = volume for transaction k

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

2.5.3 Alternative calculation method

An alternative calculation method shall be used 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.

⁷ Trimming refers to the exclusion of symmetrical shares of the total volume of transactions from the transaction dataset before calculation. The transactions are ordered according to their respective interest-rate levels, after which 12.5 per cent of the transaction volume with the lowest interest rates and 12.5 per cent with the highest interest rates are excluded from further calculations.

k = an index representing each value date for SWESTR

$$S_{westr_{i-k}} = \begin{cases} S_{westr_{i-k}} \text{ calculated with normal calculation method, } k = 0 \\ \text{determined SWESTR value for value day } i - k, k > 0 \end{cases}$$

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

$\alpha_{i-k} = \frac{v_{i-k}}{V} \in [0,1]$ 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:

$$1. \quad v_{Rapp,i} = \begin{cases} v_i \left(\frac{3 - \text{Number of reporters}_i}{\text{Number of reporters}_i} \right), & 0 < \text{Number of reporters} < 3 \\ 0, & \text{Number of reporters} \geq 3 \end{cases}$$

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

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

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

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

Special cases when no transactions exist, for example due to a technical error, $a_{i-1} = 1$ and $a_i = 0$ are set, i.e. we reuse the previous value date entry.

2.5.4 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.

2.5.5 Calculation times⁸

Calculation prior to regular publication of SWESTR takes place at 08.30.

⁸ The times apply as from SWESTR with value date 28 April 2023. Before that, the applicable times are 10.00 and 13.00 respectively.

Calculation prior to any publication of a corrected SWESTR takes place at 11.30.

2.5.6 Rounding

Any rounding takes place as late as possible and follows established mathematical principles for rounding.⁹

2.5.7 Reasonability assessment

As a precautionary measure, a reasonability assessment is performed prior to a calculated value for SWESTR being determined and published. If a calculated value is clearly unreasonable with respect to the current transaction dataset, SWESTR is determined using the alternative calculation method that is normally used if the transaction dataset is unavailable.

2.6 Determination of a corrected SWESTR

In the event of transaction data being reported and/or validated after the first calculation point, the Riksbank may determine a corrected value for SWESTR. A corrected value may also be determined following an earlier technical error.

A corrected value for SWESTR will be determined if, and only if, the absolute value of the difference between the previously determined value and calculated value at the second calculation point exceeds 0.02 percentage points (2 basis points).

A corrected value replaces the previous value as the determined value for SWESTR on the day in question.

If a corrected SWESTR value has been determined, this will be communicated on the Riksbank's website.¹⁰ 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.

2.7 Continuity

The Riksbank has detailed routines regarding calculation of SWESTR and always strives to be able to publish SWESTR in accordance with the provisions in Section 4. The Riksbank will firstly apply the normal calculation method for SWESTR and as a secondary alternative apply the alternative calculation method in accordance with Section 2.4.

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.

¹⁰ 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 SWESTR with value date 28 April 2023. 14.00 applies before that.*

If the Riksbank, has not published a value for SWESTR by 12.00 on the publication date, the provisions below apply to SWESTR users.

A value equivalent to the SWESTR value on the preceding banking day, adjusted for any changes on the Riksbank's policy rate is then applied as the SWESTR value. This corresponds to the value that would have been determined for SWESTR using an alternative method in the event of a technical error.

3 Methodology for determining average interest rates and index

3.1 Design and use

The Riksbank provides backward-looking compounded average rates and an index based on the determined values for SWESTR. The average rates and the index are cumulative and reflect a continuous accrual of SWESTR. The average and index are thus of the type commonly referred to as *cumulative compounded (average rate)* and allow, among other things, the use of *observation shift*.

Average interest rates based on SWESTR are provided for the time periods of 1 week and 1, 2, 3 and 6 months. The average rate for a particular period of time is only provided if the starting date for the period is 1 September 2021 or later.

The index is provided because it allows easy calculation of the average rate of SWESTR over a period between any two banking days.

3.2 Method of calculation and market conventions

3.2.1 Day count convention

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

3.2.2 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 (inclusive) to its end date (exclusive).

In case the calculated starting date is not a banking 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,
- 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 date i is calculated using the following formula:

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

where:

t = an index representing each banking day in the period starting with $t = 0$ and concluding with value date i

r_t = SWESTR value published on banking day t , i.e. $r_t = Swestr_{t-1}$

n_t = the number of calendar days that interest rate r_t applies for

d_c = the number of calendar days in the interest rate 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-banking days

3.2.3 Index

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

where:

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

r_t = SWESTR value published on banking day t , i.e. $r_t = Swestr_{t-1}$

n_t = the number of calendar days that interest rate r_t applies for

$t = 0$ 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-banking days

3.2.4 Agreement between index and average rates

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

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

where:

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

$Index_i$ = SWESTR index with value date i

3.3 Rounding

Any rounding shall be done as late as possible before publication and shall follow established mathematical principles for rounding.¹¹

¹¹ 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.

3.4 Determination of corrected average rates and index

Corrected values for average rates and index are 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.

4 Publication

4.1 Publishing tools

API

The official publication of SWESTR and of the average rates and index based on SWESTR are the publication in the *application programming interface* (API) provided by the Riksbank for these purposes.

The Riksbank's website

The information is also published on the Riksbank's website. The Riksbank's website comprises the alternative publication channel in case contingency routines need to be applied for publication.

4.2 Publication times

SWESTR¹²

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

Any corrected value for SWESTR will be published at 12:00.

Average rates and index¹³

Average rates and index based on SWESTR are published every Swedish banking day at 09.05.

Any corrected values for average rates and index are published at 12.05.

4.3 Publication format

SWESTR is published as a percentage to three decimal places. In addition to the rate value, the following information about the transaction dataset is published:¹⁴

- total volume (SEK million)
- number of transactions
- number of reporting agents that have reported transactions

¹² The times apply as from SWESTR with value date 28 April 2023. 10.00 and 13.00 respectively apply before that.

¹³ The 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.

¹⁴ The interest rates at the trimming boundary will be published daily as from the SWESTR value for value date 31 May 2023. In close connection to the publication of this value, information on equivalent interest rates for all SWESTR values already published will be presented.

- the interest rate at the upper trimming boundary, equal to the interest rate at the 87.5 percentile of the transaction volume (as a percentage to two decimal places)
- the interest rate at the lower trimming boundary, equal to the interest rate at the 12.5 percentile of the transaction volume (as a percentage to two decimal places)

The published information relates to the transaction dataset prior to trimming.

Corrected information about the transaction dataset is also published in the event of a corrected value for SWESTR.

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

Index for SWESTR is 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.

Average rates and index

The average rates and index have 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

Conditions for use and re-publication of SWESTR, including average rates and the index, are published on the Riksbank's website in Swedish and English.

5 Questions, comments and complaints

5.1 Questions and comments

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

5.2 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.

5.3 Reporting anomalies

The Riksbank provides, through the compliance specialists in the Risk Division, an internal reporting channel for "whistle blowing". Through this channel, Riksbank staff can anonymously report any anomalies, for example with regard to SWESTR.

6 Revision history of the document

Tabell 1. Revision history

Revisions of SWESTR: Comprehensive information on Sveriges Riksbank's framework for SWESTR

Decision date	Publication date	Document registration number (dnr)	Revisions
21 June 2021	22 June 2021	2021-00767	Original version of the document.
30 September 2021	1 October 2021	2021-00767	Clarifications about minimum transaction volume, calculation times, determination of corrected values, continuity routines, published information about the transaction dataset and the start date of average rates. Addition of information regarding the reasonability check and what users of SWESTR should do in the event that the Riksbank does not manage to publish SWESTR. Editorial changes to ensure the clarity and accuracy of the document.
1 June 2022	8 June 2022	2022-00722	Editorial changes as a consequence of the creation of the IT and Digitalisation Department and the fact that the Riksbank's repo rate has changed name to the Riksbank's policy rate. Revision history added
19 December 2022	2 January 2023	2022-00722	Revisions as a result of the annual review of policy documents. References to the Sveriges Riksbank Act (2022:1568) have been added. Formulas have been clarified and information about the classification of counterparties and intra-group transactions have been added, but no material changes have been made. Beyond this, only minor editorial changes have been made.
30 March 2023	31 March 2023	2023-00457	Revision as a result of organisational changes at the Riksbank with regard to the work on SWESTR, the earlier publication times and the expansion of the information provided on the transaction dataset for SWESTR.
27 May 2024	23 September 2024	2024-00452	Revision as a result of changes in the alternative calculation method, changes of the robustness requirements and a special case for the first business day of the year when the alternative calculation method is used.



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