

## ARTICLE – SWESTR is a part of the global reform of reference rates

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The traditional reference rate in Swedish kronor, STIBOR, is based to an excessive degree on judgements rather than actual transactions. To maintain confidence in Swedish reference rates, the Riksbank considers it important that market participants stop using STIBOR and instead use transaction-based reference rates. The Riksbank has therefore undertaken to calculate and publish a fully transaction-based reference rate, which has been named SWESTR. Market participants should as soon as possible stop using STIBOR at its shortest maturity and instead use SWESTR. In the longer run, the Riksbank considers that STIBOR should cease for all maturities. A transition needs to take place in an orderly manner, and is therefore a development project over the course of several years.

The Riksbank producing a new reference rate is part of international work aimed at reducing the dependence on traditionally used reference rates (so-called interbank rates) in favour of new transaction-based reference rates. All around the world, more and more central banks are beginning to publish this type of rate, and these rates are now being used on the financial markets.

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### Reference rates fulfil an important function in the financial system

A reference rate functions as a benchmark in the pricing of financial contracts. The aim is for pricing to follow market developments, and for none of the parties to the contract to be able to steer its level. Reference rates are used around the world in a number of different contracts and for large contract values, for instance, when pricing loans with variable rates offered to households and companies, and when pricing derivatives and establishing rates on bonds with variable coupons. As reference rates have such an important function on financial markets, it is important that they reflect fair pricing and inspire a high level of confidence.<sup>146</sup>

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<sup>146</sup> See *Reforming major interest rate benchmarks*, July 2014, Financial Stability Board.

## Interbank rates have become less relevant

For almost 40 years, what are known as Interbank Offered Rates, IBORs, have been used as reference rates. Interbank rates are determined daily by a panel of banks, and their purpose is to reflect the interest rates used by the banks when lending to one another.<sup>147</sup> When the interbank rate is to be established, the panel banks report bids. If there are not enough transactions, the bids are instead based on the banks' judgements.

For contracts in Swedish kronor, the reference rate has been STIBOR (Stockholm IBOR) for almost 40 years now.<sup>148</sup> STIBOR has been used, for instance, in pricing derivatives, in diverse leasing agreements and in lending at variable rates to companies and housing cooperatives. Changes in STIBOR tend to be followed by changes in mortgage rates charged to households.<sup>149</sup> As in the case of other interbank rates, STIBOR is based on contributions or bids from the panel banks.<sup>150</sup>

Over time, the number of transactions on which to base the bids has declined, as interbank loans are not the banks' primary funding source today. The banks do not obtain funding in the same way now as they did when interbank rates were first used. As the number of transactions declines, the bids are increasingly based on judgements. This has led to a fall in confidence in the traditional interbank rates. During the so-called LIBOR scandal in 2012, it was also revealed that several panel banks had manipulated bids for their own gain. The need to reform reference rates became even clearer.

For several years now, there has been international work on reforming reference rates, which has had two clear objectives.<sup>151</sup> Firstly, when calculating interbank rates (including STIBOR) actual transactions shall be used as far as possible and the use of judgements reduced. Secondly, new and completely transaction-based reference rates shall be developed.

### STIBOR is too rarely calculated using actual transactions

STIBOR's administrator, the Swedish Financial Benchmark Facility (SFBF), is now reforming STIBOR with the purpose of ensuring that it meets the requirements in the EU Benchmark Regulation. If STIBOR is to continue to be used after 2021, the SFBF must apply to FI for authorisation by the end of this year. If STIBOR receives authorisation,

<sup>147</sup> In Sweden, seven banks take part in the STIBOR panel.

<sup>148</sup> According to the SFBF, The total value of financial instruments and financial contracts referencing STIBOR is about eight times larger than the gross national product of Sweden. See "The Evolution of STIBOR, SFBF Consultation Paper", March 2021, Swedish Financial Benchmark Facility.

<sup>149</sup> There is no explicit mechanical link between STIBOR and the banks' mortgage rates, but changes in STIBOR also tend to be followed by changes in mortgage rates. See R. Eidestedt, D. Forsman and E. Ünü (2020), "The funding of the major Swedish banks and its effect on household mortgage rates", *Economic Commentaries* no. 8, Sveriges Riksbank.

<sup>150</sup> STIBOR's administrators describe the contribution of a panel bank as being based on actual transactions, when these are available, and on a combination of other sources of information and modelling techniques when transactional evidence is insufficient, see SFBF Consultation Paper, p. 11, Swedish Financial Benchmark Facility.

<sup>151</sup> For a more in-depth description of the background to the global reform of reference rates, see the article "A new reference rate - the way forward" in *Financial Stability Report*, May 2020, Sveriges Riksbank.

FI will in accordance with the Benchmark Regulation continuously assess STIBOR's capacity to measure the underlying market and evaluate whether it still lives up to the requirements of the Regulation.

The EU's Benchmark Regulation requires that when calculating the rate, one should use actual transactions as far as possible, instead of the banks' judgements. In the proposal for a reformed STIBOR, the SFBF has therefore for instance extended the permitted transaction base so that more types of transaction than before can be used as a basis for calculating STIBOR.

In March, the Riksbank responded to SFBF's open consultation on reforming STIBOR. The Riksbank notes that the proposal means that the rate would, despite the proposed reforms, be calculated to a large degree based on judgements and mathematical methods, rather than on actual transactions. And this applies to all maturities at which STIBOR is supplied. Moreover, there are deficiencies with regard to transparency concerning STIBOR. The ongoing reform of STIBOR therefore does not instil confidence. Nor is it possible to judge whether STIBOR is fair with regard to the underlying market, as the calculation is based to such a large degree on judgements. This applies in particular to STIBOR at the shortest maturity (T/N), where 90 per cent of the calculation is based on so-called level 3 contributions. Level 3 contributions are the type of contribution to the calculation that leaves the largest scope for the banks' own judgements. STIBOR is used in pricing many different kinds of financial contract, and thus affects the interest expenses faced by households and companies, among others. It is therefore not acceptable from a consumer protection perspective that the rate should rely to such a large extent on the banks' judgements.<sup>152</sup>

## Reference rates in global transition

As the traditional interbank rates have become less relevant, the central banks in many countries have taken an active role in the reforms by calculating and publishing new, fully transaction-based reference rates for the shortest maturity. With regard to some currencies, it has been established that these new, transaction-based reference rates will replace the interbank rate. With regard to other currencies, the new and the old reference rates will exist side by side; but even in these jurisdictions there is a clear ambition to use the transaction-based reference rates to an increasing extent. The Riksbank has also undertaken to calculate and publish a fully transaction-based reference rate. The Swedish rate has been given the name SWESTR (Swedish krona Short Term Rate). The Riksbank calculates SWESTR based on transactions in Swedish kronor that are made on the money market overnight (O/N).<sup>153</sup> SWESTR thus aims to reflect the current rate on the overnight market.

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<sup>152</sup> For a more detailed account, see "The Riksbank's response – Open consultation on reform of STIBOR", March 2021, Sveriges Riksbank.

<sup>153</sup> SWESTR is calculated based on transactions without collateral with banks, financial institutions and non-financial companies that lead to deposits with the Riksbank's monetary policy counterparties. See the Riksbank's website for more information.

The global reform of reference rates is thus in full swing. The methods used to produce interbank rates have, in many cases, been adjusted and new, transaction-based reference rates have been produced. The most commonly used interbank rate globally, LIBOR, will cease to exist entirely. The Bank of England states that as LIBOR is based to such a large extent on judgements, one cannot rely on it taking into account the users' interests in times of stress.<sup>154</sup> There is thus a clear consumer protection perspective in the aim to abandon interbank rates. The British supervisory authority, the FCA, confirmed in March 2021 that LIBOR will cease to exist.<sup>155</sup> LIBOR in all its currencies will be replaced by several different transaction-based reference rates, depending on the currency concerned. Enormous contract values need to be changed over, in many different types of contract. And this affects not only the banks reporting bids to LIBOR, but also the actors using LIBOR as reference rate in contracts. It therefore also affects Swedish banks that have entered into contracts with LIBOR as reference rate.

Within the euro area, there are several reference rates in EUR. At the shortest maturity, the EONIA interbank rate (O/N maturity) will cease in January 2022, and then be entirely replaced by the ECB's transaction-based reference rate €STR. There is at present no decision that the interbank rate for longer maturities in EUR, EURIBOR, shall cease. The ECB states that the average rates it calculates that are based on historical listings for €STR can be used partly in new contracts with longer maturities, and partly as the base for a fall-back rate to EURIBOR.<sup>156, 157</sup> In Norway, the Norwegian working group shows that it has the same vision when it describes the average rate for the transaction-based NOWA at 3 months as an alternative to using the NIBOR interbank rate for the 3-month maturity.<sup>158</sup> See Table 3 below for an overview of the status in a sample of countries.

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<sup>154</sup> "We are acutely aware this is a difficult time for many businesses, facing an uncertain future in the midst of the Coronavirus epidemic. But it's just not safe to keep relying on LIBOR. And it's not good for your business either. A benchmark based on guesswork can't be relied upon to behave in your interests at times of stress." See A. Hauser (2020), "From LIBOR to SONIA: A bridge to the future", 21 September 2020, Bank of England.

<sup>155</sup> LIBOR will cease to exist with regard to most currencies and maturities on 31 December 2021, and for the remaining maturities (in US dollars) on 30 June 2023. See "Announcements on the end of Libor", March 2021, Financial Conduct Authority.

<sup>156</sup> The fallback rate to EURIBOR is the rate that will be used instead if EURIBOR ceases during the contract period.

<sup>157</sup> See "Public consultation on the publication by the ECB of compounded term rates using the €STR", July 2020, European Central Bank.

<sup>158</sup> See Consultation – principles for calculating and publishing Nowa, 15 October 2020, The Norwegian working group for reference rates (ARR).

**Table 3. Transaction-based reference rates published by central banks**

The table contains a selection of rates published by central banks

Country/area	Traditional reference rate	Status	New reference rate	Launch
EU	EONIA	Will cease on 3 January 2022	€STR (replaces EONIA)	2 October 2019
EU	EURIBOR	Adjusted method, no cessation date	€STR	2 October 2019
EU	LIBOR (EUR)	Will cease on 31 December 2021	€STR	2 October 2019
United States	LIBOR (USD)	Will cease on: - 31 December 2021 (1W & 2M maturities) - 30 June 2023 (other maturities)	SOFR	3 April 2018
United Kingdom	LIBOR (GBP)	Will cease on 31 December 2021	SONIA	Original version: March 1997 Updated version: 23 April 2018
Sweden	STIBOR	Proposal for adjusted method, no cessation date	SWESTR	Late summer 2021 (test period from 27 January 2021)
Norway	NIBOR	Adjusted method, no cessation date	NOWA	Original version: 2011 Updated version: 1 January 2020
Denmark	CIBOR	Partially adjusted method, no cessation date	DESTR	Preliminary: launch in early 2022

Note: Note that LIBOR for the various currencies can be classified under several countries and that LIBOR is in practice used much more broadly than is specified in the table above. To provide a better overview of the various rates, however, we have classified them in this table so that LIBOR for each currency respectively appears under the country in which the currency originates.

Sources: Website of each administrator (for the traditional interbank rates) and central bank (for the new reference rates).

## The Riksbank supplies SWESTR – a fully transaction-based reference rate

In January, the Riksbank began an approximately six-month long test period for the SWESTR reference rate.<sup>159</sup> The purpose of the test period is partly to give market participants a chance to familiarise themselves with SWESTR, and partly to give both the Riksbank and the reporting banks an opportunity to test their routines and systems. The evaluations are still ongoing, but the Riksbank's assessment so far into the test

<sup>159</sup> During the test period, SWESTR will only be published for information purposes and shall not be used in financial contracts.

period is that the daily process for establishing and publishing SWESTR works well. Towards the end of summer 2021, the Riksbank will begin publishing the official SWESTR.

The traditional interbank rates are supplied at several different (forward-looking) maturities.<sup>160</sup> The reason why SWESTR, like its international equivalents, is only calculated for the shortest maturity (O/N) is that there needs to be a sufficient amount of transactions in Swedish kronor each business day to use to calculate the rate, for it to be credible and representative. It is namely at shorter maturities that most transactions without collateral in Swedish kronor take place, and with a sufficiently steady flow to enable calculation of a reference rate without any individual agent being given too much weight.

## An increasing number of central banks calculate average rates

Work is now under way around the world to enable the new reference rates to also be used in contracts with maturities that are longer than the very shortest. At present, there are two possible ways. One way is to calculate backward-looking average rates based on the history of the transaction-based reference rate. These rates are calculated as averages over periods back in time (for instance, a three-month average rate for SWESTR is calculated as the average of the past three months' published values for SWESTR).<sup>161</sup> The other way is to create, in addition to backward-looking rates, forward-looking rates that are based on traded derivatives with the new rates as a base. However, in most countries the derivative markets with the new reference rates as a basis are currently not large enough to form the foundation for reliable forward-looking reference rates. Only two countries, the United Kingdom and Japan, have recently managed to generate enough trade in the new reference rates for private agents to be able to calculate and publish forward-looking term rates.<sup>162</sup> When the use of SWESTR increases, a derivative market with SWESTR as a base may well

<sup>160</sup> STIBOR exists at the maturities Tomorrow-Next (T/N), 1 week, 1 month, 2 months, 3 months and 6 months.

<sup>161</sup> The proposed formula for calculating the average rate for SWESTR, p. 11 in the consultation "Calculation of average interest rates and an index for the SWESTR reference rate", April 2021. Sveriges Riksbank.

$$\text{Compounded average rate} = \left[ \prod_{i=1}^{d_b} \left( 1 + \frac{r_i \times n_i}{N} \right) - 1 \right] \times \frac{N}{d_c}$$

where,

$i$  = an index that represents each business day in the interest period,  $r_i$  = the SWESTR value published on business day  $i$  (which is based on transactions made on the previous business day,  $i-1$ ),  $n_i$  = number of calendar days for which rate  $r_i$  applies (generally 1 day, except for Mondays where it will be 3 days to account for the accrual over the weekend or where adjustment is needed due to other holidays) = number of calendar days for which  $r_i$  is compounded,  $N$  = Number of days in the year, i.e. 360,  $d_c$  = Number of calendar days in the interest period,  $d_b$  = Number of business days in the interest period.

<sup>162</sup> In the United Kingdom, two official versions of forward-looking rates for the SONIA reference rate have been published since the beginning of 2021: Refinitiv Term SONIA and ICE Term SONIA Reference Rate. In Japan, test rates have been published by the company Quick Corp since May 2020, the aim being to publish these officially, and thus be able to use them in actual contracts, from the middle of 2021.

emerge, with which forward-looking transaction-based rates can also be calculated in Sweden.

Many central banks have chosen to calculate and publish backward-looking average rates. For instance, the central banks in the EU, Norway and the United States have already begun to publish such rates.<sup>163</sup> Several other central banks have announced that they intend to do the same shortly. This also applies to the Riksbank. The plan is to begin publishing average rates for SWESTR during the third quarter of this year.<sup>164</sup>

International practice is to calculate the average rates as a compounded average of already published values for the transaction-based reference rate, in Sweden's case SWESTR.<sup>165</sup> As the average rates are calculated based on historical values, they are backward-looking. When a financial contract is based on this type of rate, one does not know until afterwards (when maturity is reached) what the actual rate will be.

The purpose of calculating average rates is so that the transaction-based reference rates can also be used in contracts with longer maturities, that is, the type of contract where traditional reference rates are currently used. Average rates do not in themselves have longer maturities (as they are backward-looking), but they can be used in contracts with longer maturities.

The EU Benchmark Regulation also makes requirements that mean that a so-called fall-back solution must be included in contracts where STIBOR is used.<sup>166</sup> This means that the contract shall contain a description of what happens if STIBOR ceases to apply during the contract period. In current international practice, the basis of the fall-back solution is the average rate for a transaction-based reference rate - in our case the average rate for SWESTR. The average rates for SWESTR can thus be used both in new contracts and as a fall-back solution to STIBOR.

## When SWESTR begins to be used later this year there will be a better alternative than STIBOR

When the Riksbank's reference rate SWESTR comes into use at the end of the summer, there will thus be two Swedish reference rates which market participants can choose to refer to when entering into new financial contracts in Swedish kronor.

In the initial stage, SWESTR will be a complement to STIBOR. However, there are good reasons to replace STIBOR in the near term at the shortest maturity (STIBOR T/N) with

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<sup>163</sup> Compounded €STR average rates (European Central Bank), NOWA compounded averages (Norges Bank) and SOFR Averages (Federal Reserve Bank of New York).

<sup>164</sup> See "Calculation of average interest rates and an index for the SWESTR reference rate", April 2021, Sveriges Riksbank.

<sup>165</sup> Using a compounded average takes into account the compound interest effect, which can be considered to give a more accurate average as it better reflects the change in value over time. Another alternative is to calculate a simple average, that is, the mathematical average.

<sup>166</sup> See Article 28.2, 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 (Benchmark Regulation).

SWESTR, in line with international practice. SWESTR's maturity (O/N) is moreover similar to STIBOR's shortest maturity. The need for this kind of changeover in Sweden will become even clearer as STIBOR, even after the current reform, will be based to an excessive degree on judgements instead of actual transactions.

For contracts with longer maturities, average rates for SWESTR can be used instead of STIBOR at its longer maturities. Now that average rates are beginning to be used globally in various types of financial contract, it will show what kind of development we can expect in Sweden, too, going forward.

With the advent of SWESTR, the prerequisites will be in place for a fully transaction-based reference rate to take a larger place on the Swedish financial markets going forward. The new transaction-based reference rates are being used increasingly around the world, which means that agents are beginning to get used to them and they are becoming increasingly established. In the long run, we cannot hold onto our own national solutions in Sweden. The changeover we are now seeing on a global level also needs to take place here – by market participants beginning to use SWESTR when it starts being published. In the short term, SWESTR should replace STIBOR at its shortest maturity. In the longer run, the Riksbank considers that STIBOR should cease for all maturities, as it no longer inspires confidence. A transition needs to take place in an orderly manner, and is therefore a development project over the course of several years. The Riksbank will be active in, and support, this transition.