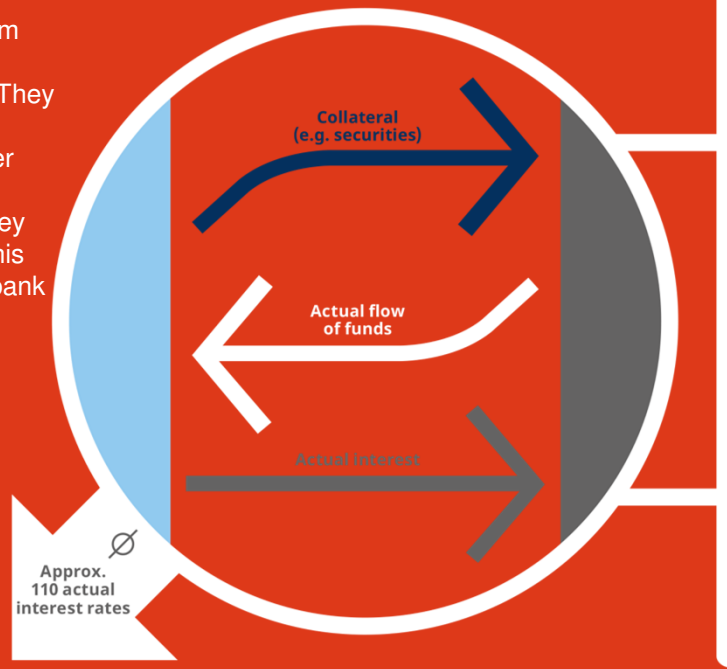
Compound Rate for SARON

December 2018

SIX operates the fully automated trading platform for the **secured money market** (short-term credit funding) in Switzerland (SIX Repo). The SARON reference rate reflects this repo market. **"Funding against collateral"** is the rule in the repo market. More than **160 banks and Insurance companies** take part in the Swiss repo market, including the Swiss National Bank (SNB), which uses it to supply Switzerland's economy with liquidity.

Secured Money Market in Switzerland

Banks receive funds from the SNB by depositing securities as collateral. They pledge to buy back those securities at a later date and **pay interest.** Banks also borrow money from each other using this principle (secured interbank market).

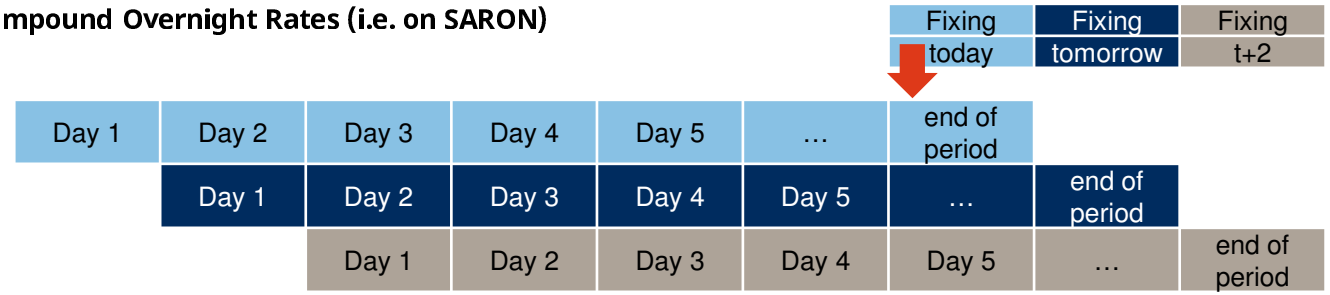


SARON is an Overnight Rate and applies for the upcoming overnight period.
To allow market participants to engage into longer term contracts over several months or longer for mortgages, loans, swaps, futures and floating rate notes SIX is going to offer compound rates for SARON.

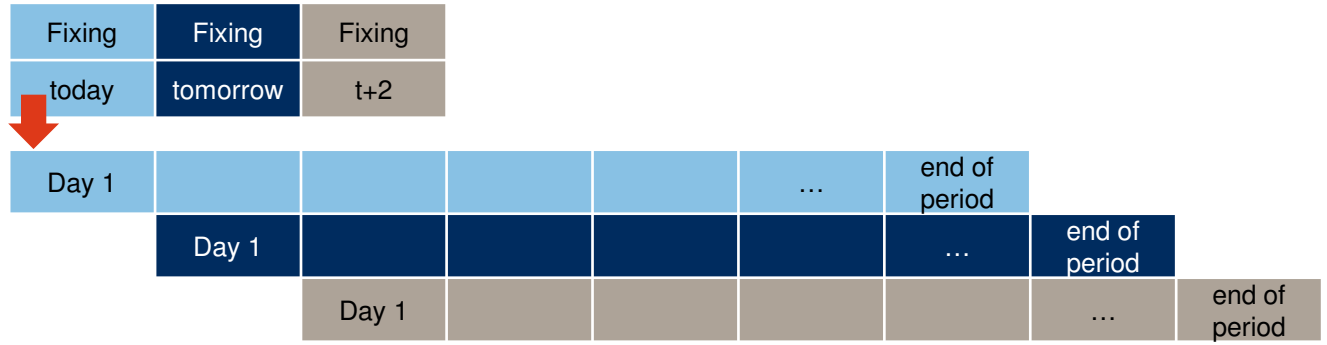
Actual **concluded transactions and quotes** flow into the calculation of SARON.
A**pproximately 110 interest rates** per day on an annual average.

Compound Overnight Rates are finalized at the end of the period vs. today's fixing in advance

Rolling Compound Overnight Rates (i.e. on SARON)



LIBOR



Background Information

Libor 3 month: The rate is **determined ex-ante** for the 3 months period

Overnight rates:
The rate is published the day before for the **upcoming overnight** period (SARON) or the rate is published for the **previous overnight** period (e.g. SONIA) / Fixing at the end of the period of the rolling compound

Methodology Compound - by month

1. Determine the end date and start date for the relevant compound rate. For the n-month compound rate, the end date is the business day for which the SARON is being determined (calculation and publication date)
2. The start date is the business day **n months** before the end date, based on a Modified Following business day convention. The start date and end date will both always be business days
3. If the start date falls on a non-business day according to the repo calendar the business day that precedes the start date will be used as start date, unless this new start date would fall within a different month. In such cases not the preceding business day, but the following business day will be used as start date
4. Calculate the compound overnight rate over the tenor period as:

$$\left[\prod_{i=1}^{d}\left(1+\frac{r_i a_i}{b}\right)-1\right]\frac{b}{n}$$

Where **n** is the number of calendar days from (and **including**) the start date to (but excluding) the end date

d is the number of business days in the same period

b is the applicable day count fraction denominator (360 for CHF)

ri is the SARON for business day ***i***

ai is the number of calendar days in the period for which SARON ***ri*** applies.

Rounding: the compound rate is calculated with six decimals like the SARON.

Example: For the **1 month** compound rate with the end date 2018-10-08 the start date is 2018-09-07 because 2018-09-08 is a non-business day. In case 2018-09-07 would have been a non-business day, too, 2018-09-06 is the start date. The combination of an end date 2018-10-08 and a start 2018-09-06 is therefore only possible if 2018-09-07 and 2018-09-08 are non-banking days.

Methodology Compound - by days

1. Determine the end date and start date for the relevant compound rate. For the n-month compound rate, the end date is the business day for which the SARON is being determined (calculation and publication date).
2. The start date is the business day **n days** (30, 60, 90, 180, 270, 360) before the end date, based on a Modified Following business day convention. The start date and end date will both always be business days.
3. If the start date falls on a non-business day according to the repo calendar the business day that precedes the start date will be used as start date, unless this new start date would fall within a different month. In such cases not the preceding business day, but the following business day will be used as start date
4. Calculate the compound overnight rate over the tenor period as:

$$\left[\prod_{i=1}^{d}\left(1+\frac{r_i a_i}{b}\right)-1\right]\frac{b}{n}$$

Where ***n*** is the number of calendar days from (and **including**) the start date to (but excluding) the end date

d is the number of business days in the same period

b is the applicable day count fraction denominator (360 for CHF)

ri is the SARON for business day ***i***

ai is the number of calendar days in the period for which SARON ***ri*** applies.

Rounding: the compound rate is calculated with six decimals like the SARON.

Example: For the **30 day** compound rate with the end date 2018-10-08 the start date is 2018-09-07 because 2018-09-08 is a non-business day. In case 2018-09-07 would have been a non-business day, too, 2018-09-06 is the start date. The combination of an end date 2018-10-08 and a start 2018-09-06 is therefore only possible if 2018-09-07 and 2018-09-08 are non-banking days.

Methodology Compound - by IMM (International Monetary Market) calendar

1. Determine the end date and start date for the relevant compound rate. For the n-month compound rate, the **end date** is the **3rd Wednesday of the month** (calculation and publication date).
2. The **start date** is the **3rd Wednesday n months** before the end date, based on a Modified Following business day convention. The start date and end date will both always be business days.
3. If the start date falls on a non-business day according to the repo calendar the business day that precedes the start date will be used as start date, unless this new start date would fall within a different month. In such cases not the preceding business day, but the following business day will be used as start date
4. Calculate the compound overnight rate over the tenor period as:

$$\left[\prod_{i=1}^{d}\left(1+\frac{r_i a_i}{b}\right)-1\right]\frac{b}{n}$$

Where **n** is the number of calendar days from (and **including**) the start date to (but excluding) the end date

d is the number of business days in the same period

b is the applicable day count fraction denominator (360 for CHF)

ri is the SARON for business day ***i***

ai is the number of calendar days in the period for which SARON ***ri*** applies.

Rounding: the compound rate is calculated with six decimals like the SARON.

Example: The **3 month** compound rate for September 2018 has the end date 2018-09-19 and the start date 2018-06-20.

Contact and Legal Notice

Index Support
T +41 58 399 2229
indexsupport@six-group.com

Index Sales Support, Licensing and Data
T +41 58 399 2600
indexdata@six-group.com

www.six-group.com/saron

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