Nibor Transparency Statement

No 8 – 19 January 2023

The information in this statement is unaudited and provided for illustration purposes only. The information may not be regarded as part of the provisioning of the interest rate benchmark Nibor, and the information cannot for any purposes be used as a benchmark.

Nibor Transparency Statement

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The Nibor Transparency Statement has been introduced with the purpose to provide users of Nibor with information about the data which the fixings of Nibor have been based on. The statement presents some key figures underlying the Nibor fixings, including the Nibor Transparency model for the Nibor three months tenor, the tenor most widely used as interest rate reference in Norwegian kroner. The model illustrates how various individual factors have contributed to the observed development in Nibor.

The Statement is updated four times a year. This Statement includes data up to December 2, 2022. New in this statement is a summary of NoRe's assessment of how Nibor has been affected by general market developments.

Nibor – In short

Nibor shall reflect the interest rate level a bank requires for unsecured money market lending in Norwegian kroner to another bank. Nibor is calculated and published for the maturities of one week and one, two, three and six months.

The calculation of Nibor is based on submissions of data from a panel of six banks. When determining their submissions, the banks shall follow the "waterfall methodology" specified in the Nibor Panel Bank Code of Conduct.

Nibor

Nibor is derived from "Norwegian Interbank Offered Rate" and is the collective term for the set of Norwegian kroner money market interest rates administered by Norske Finansielle Referanser AS (NoRe).

Nibor is calculated and distributed by Global Rate Set Systems (GRSS). GRSS also acts as licensing agent for Nibor.

Brief introduction to the Nibor calculation methodology

The Nibor Panel Banks must be active in the market in which the redistribution of NOK liquidity takes place – in the relevant maturities and throughout the market's trading hours – and have been active for a period of at least three months. The panel banks are also required to quote committing sales prices on Certificates of Deposits (CDs) or Commercial Papers (CPs) denominated in NOK, for the maturities 1, 2, 3 and 6 months. Minimum sales commitment is NOK 100 million for all maturities.

When determining its submissions, the individual bank shall follow the Nibor "waterfall methodology" priority of use of input data, summarized as follows:

a. The bank's own interbank lending transactions concluded with leading banks in the Norwegian Money Market with a minimum value of NOK 100 million at the same day as the Fixing. If none;
b. the bank's own borrowing transactions concluded from sales of CDs or CPs denominated in NOK with a minimum value of NOK 100 million at the same day as the fixing. If none;
c. the bank's committed price quotes on CDs or CPs denominated in NOK and expert judgements based on the bank's weighted funding costs in USD and EUR, preferable prices from actual transactions. With exception for the one-week tenor, committed price quotes on CDs and CPs shall be given at least 50 percent weight in the calculations.

A spread shall be added to calculated borrowing rates, so that the submissions reflect the interest rates that the bank would charge for unsecured lending.

Nibor is fixed/calculated as trimmed averages of the interest rates submitted by the panel banks, where the lowest and the highest rates submitted are omitted. For more information about Nibor please refer to the Nibor Benchmark Statement and the Nibor Framework published on NoRe's website.

Developments since the previous statement

Since the last Nibor Transparency Statement, which included data up to September 9, 2022, the Norwegian money market has been influenced by several factors contributing to higher rates and more volatility.

Firstly, the Norwegian Central Bank has continued to rise its policy rate. During the period September 9 to December 2 the policy rate was raised twice, from 1,75 to 2,50 percent. The hikes in the policy rate together with forward signals provided by Norges Bank have impacted on all Nibor tenors. Nibor have also been affected by different market views on how fast and how high the policy rate would be lifted by the central bank.

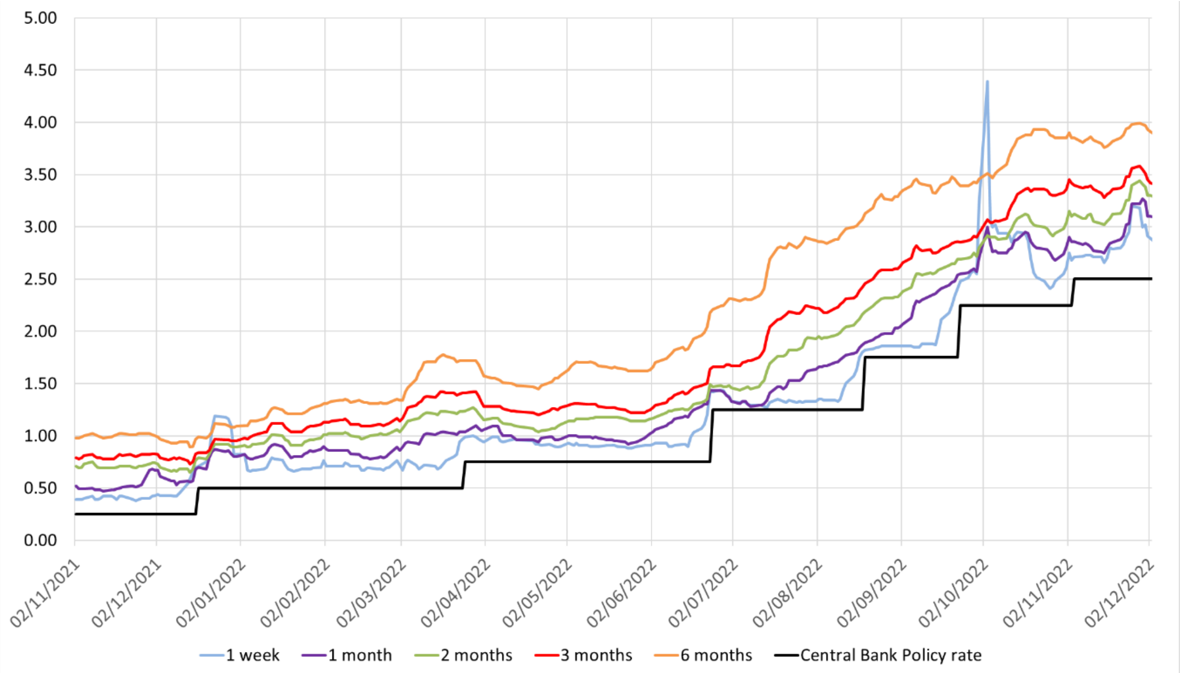
Secondly, liquidity became scarce at the turn to the fourth quarter, following much larger than expected oil tax payments. The liquidity shortage that followed resulted in significantly higher interest rates, especially for the shortest tenors. However, the lack of short-term liquidity also seemed to increase demand for longer-term liquidity, pushing upward the three- and six-month Nibor tenors.

Thirdly, year-end effects gradually affected the one to three months Nibor tenors.

The underlying market

The Norwegian money market is characterised by liquidity being redistributed between the major market participants by using the currency swap market. This has been the situation all the time since the liberalisation of the credit markets in the 1980s. The use of currency swaps reflects the characteristics of the small, open Norwegian economy, with relatively large international engagements connected to trade in raw materials and shipping. In the aftermath of the financial crisis of 2007-08, the use of unsecured interbank market lending in Norwegian kroner contracted from an already low level, in line with the developments observed internationally.

Chart 1. Nibor fixings and Central Bank policy rate. Percent. 02.11.2021-02.12.2022

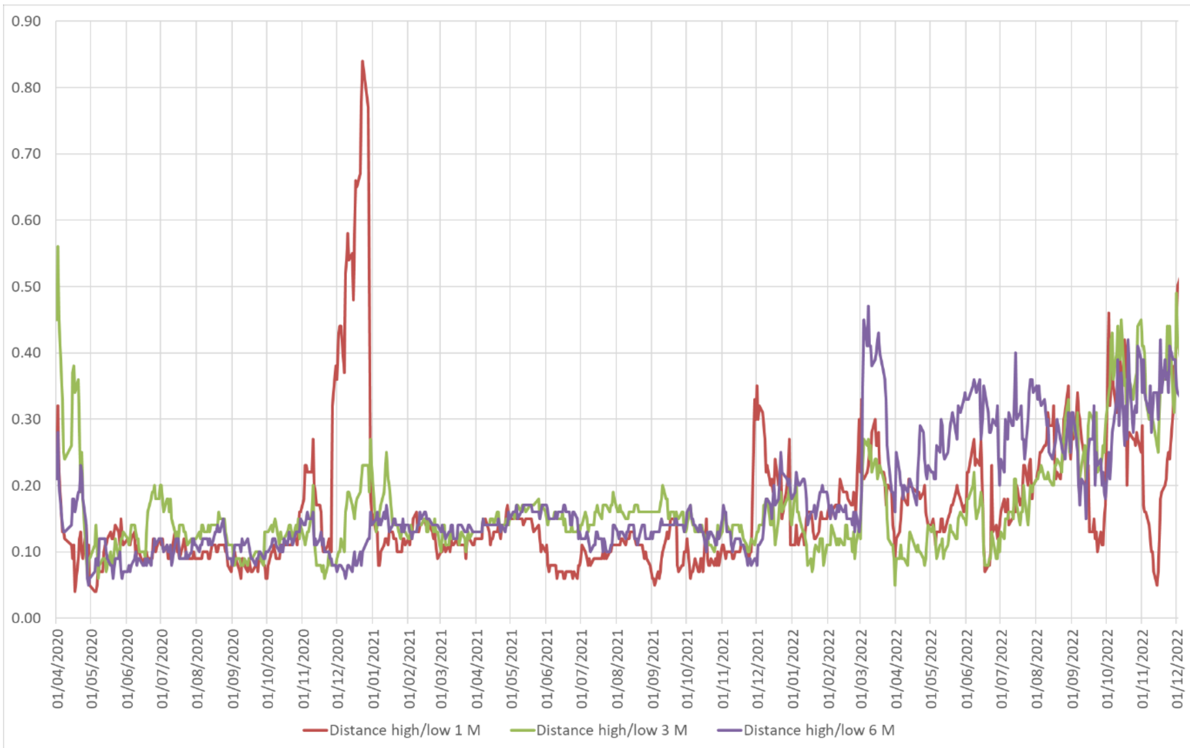


Source: Norges Bank and NoRe

Nibor input data

Following higher uncertainty about the forward interest rate level, NoRe has observed relatively large differences between the banks' submissions to Nibor. The development in observed spreads between the highest and lowest submissions for the one, three and six months Nibor tenors are illustrated in chart 2.

Chart 2. Differences in Nibor Submissions. Percentage points. 01.04.2020-02.12.2022



Source: NoRe

The lack of unsecured NOK-denominated interbank market transactions implies that the submissions to Nibor, with few exemptions, are based on assessments of funding costs and bid/offer-spreads (type c submission). Statistics on the types of submissions received since the panel banks' reporting of background data was introduced in April 2020 is presented in the table below.

Period	Number of business days	Number of fixings	Number of submissions			
			Total	Level a	Level b	Level c
01.04.-30.06.20	59	295	1770	0	0	1770
01.07.-30.09.20	66	330	1980	0	0	1980
01.10.-31.12.20	64	320	1920	0	1	1919
01.01.-31.03.21	63	315	1890	0	1	1889
01.04.-30.06.21	59	295	1770	0	0	1770
01.07.-30.09.21	66	330	1980	0	0	1980
01.10.-31.12.21	65	325	1950	0	0	1950
01.01.-31.03.22	64	320	1920	3	0	1917
01.04.-30.06.22	59	295	1770	0	0	1770
01.07.-30.09.22	66	330	1980	0	0	1980
01.10.-02.12.22	45	225	1350	0	0	1350

The Nibor Transparency model

Since Nibor primarily is based on level c submissions, the panel banks' underlying input data to level c submissions may be used to illustrate how separate factors have contributed to the calculation of Nibor. The Nibor Transparency model calculates a Norwegian Krone Offered Rate applying the same methodology as the Nibor Panel Banks use to calculate their submissions of level c, but by using averages of the underlying data reported by the banks. This illustrative derived rate is called "D-NOR". For more information about the Nibor Transparency Model please see explanation in box on the last page.

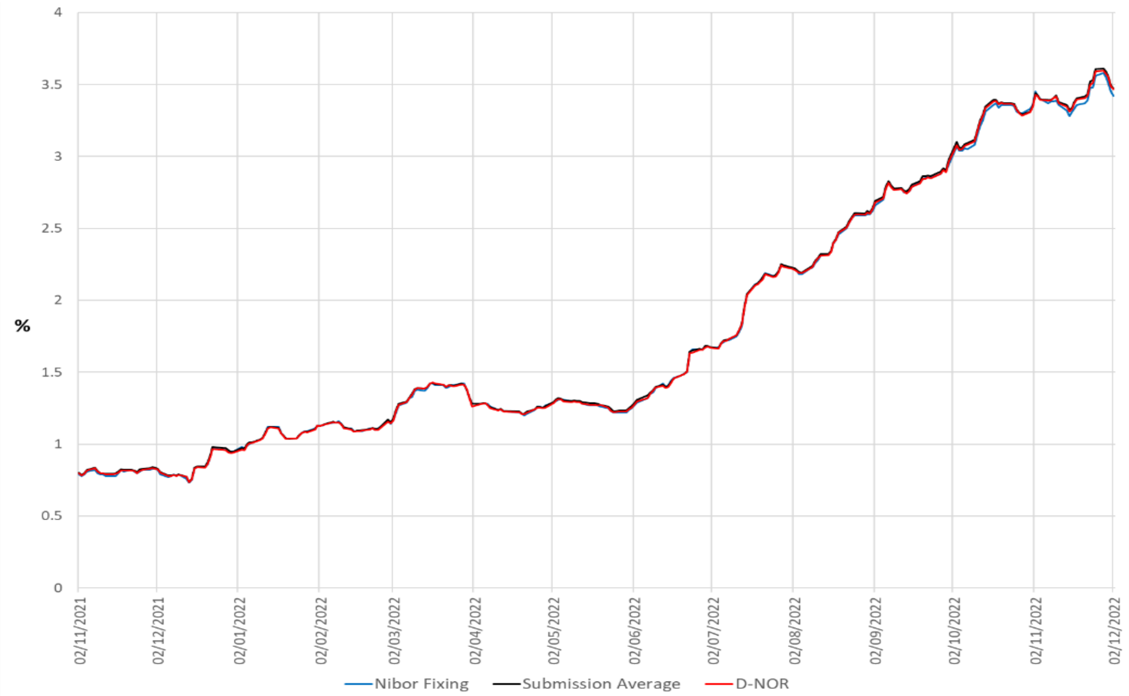
Nibor is calculated as a mean of Nibor submissions, omitting the lowest and the highest submission. This trimmed mean is normally not very different from a simple average of all submissions. The Nibor fixings, the averages of all submissions, and the D-NOR for the 3-month tenor is illustrated in Chart 3 below.

During the fall, the D-NOR and the average of all submissions have been somewhat (up to 5 basis points) higher than the Nibor fixings. The highest submissions to Nibor have generally been further away from the average than the lowest submissions. Both are excluded in the fixings of Nibor.

Underlying data for Nibor submissions

The Nibor Panel banks provide NoRe with background information on their submissions. This information is used as support for NoRe's control activity. The information to be provided depends on which level in the waterfall methodology the submissions have been based on. For transaction-based submissions (level a and b) information is to include whether or not interpolation or transactions with deviating maturity have been used. For non-transaction-based submissions (level c) the banks shall provide information about the underlying elements in their calculations (CD/CP quotes, foreign funding interest rates, foreign exchange spot and term rates) and the weights applied for each individual component. For level b and c submissions the banks also provide information on the spreads used for transforming borrowing rates into offered/lending rates.

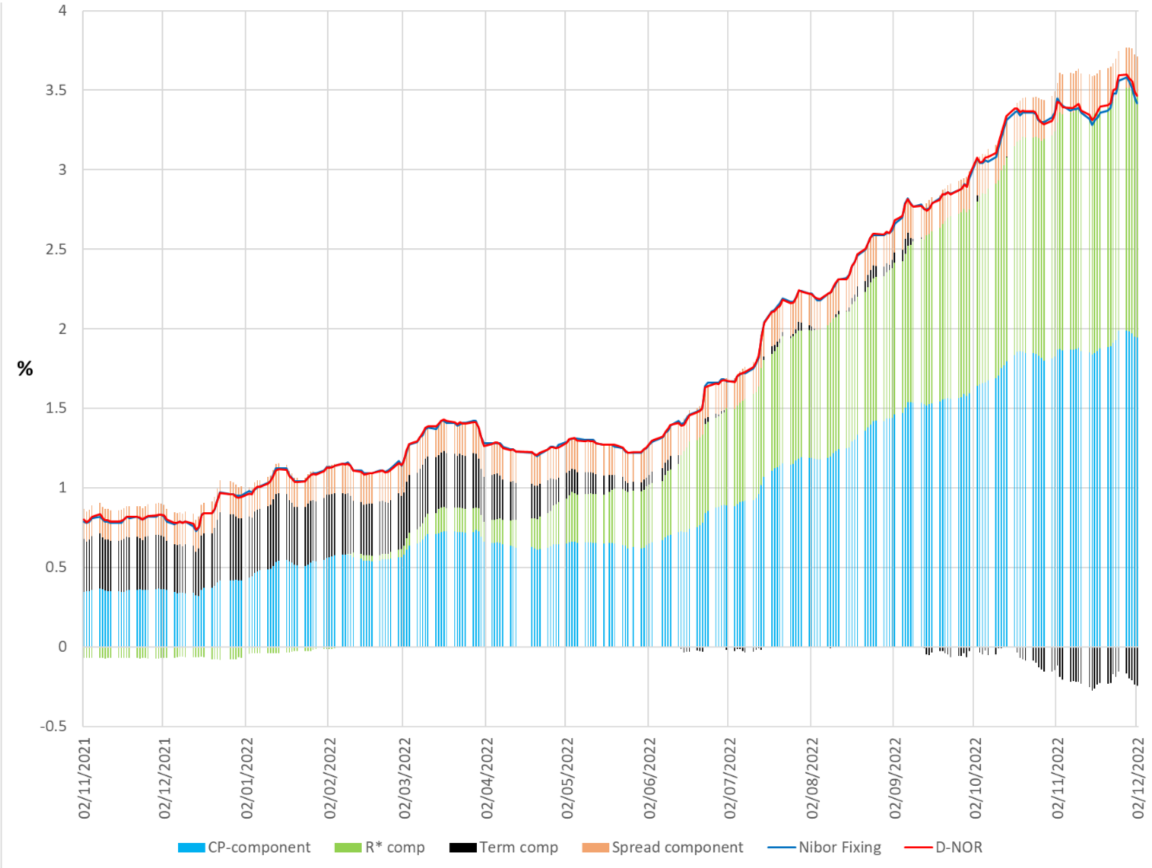
Chart 3. 3-month Nibor, the average of submissions and the D-NOR. Percent.



Source: NoRe

The Nibor Transparency Model calculations are presented in Chart 4 below. D-NOR and the corresponding Nibor fixing values are shown as lines. The underlying components are shown as stacked columns.

Chart 4. 3-month D-NOR and underlying components. Percent.



R*: Foreign lending costs, Term: Term premium from the foreign exchange market
Source: NoRe

The chart illustrates that the Norwegian Kroner three-months funding cost level since mid-October has been lower than the weighted foreign funding cost level (in EUR and USD). This development is reflected in the reduced “Term Component” (black area). However, the effects on the D-NOR have been partly offset by a somewhat higher average bid/offers-spreads (orange area). For a long time, this spread has been relatively stable around 20 basis points. The spread moved up to near 25 basis points in October and November.

The Nibor Transparency Model explained

The Nibor Transparency model calculates a Norwegian Krone Offered Rate based on background input data from the Nibor Panel Banks and the formula the banks use to determine their Nibor submissions of type c. This illustrative derived rate is called "D-NOR".

The Nibor contributions of type c is the result of calculations using the following formula:

$$\mathbf{R_{PB} = r_{PBcp}*w_{PBcp} + (r_{PBeur} + t_{PBeur})*w_{PBeur} + (r_{PBusd}+t_{PBusd})w_{PBusd} + margin_{PB}}$$

where

"$\mathbf{R_{PB}}$" is the Nibor submission of type c from the panel bank (**"PB"**),
"**w**" is the weight used on each component, in sum equal to 1,
"**r**" is interest rates from different markets,
"**t**" is the term premia from the foreign exchange marked expressed as an interest rate
"margin" is the lending-borrowing margin
"**cp**", "**eur**" and "**usd**" is short for CP/CD, euro and US dollars respectively.

The transparency model isolates the individual components into sub-submissions representing the mean of received data for each individual factor.

- CP/CD-prices (expressed as interest rates): $\mathbf{r_{cp}}$
- Foreign funding costs: $\mathbf{r_{eur}}$ and $\mathbf{r_{usd}}$
- Foreign Exchange Term premia (expressed as interest rates): $\mathbf{t_{eur}}$ and $\mathbf{t_{usd}}$
- Lending-borrowing margin/Spread: **margin**

Thereafter the offered rate (D-NOR) is calculated as a weighted average of these mean-sub-submissions using the averages of the banks' calculation weights for each factor and the following formula:

$$\mathbf{D\text{-}NOR = r_{cp}*w_{cp} + (r_{eur}*w_{eur}+ r_{usd}*w_{usd}) + (t_{eur}*w_{eur} + t_{usd}*w_{usd}) + margin}$$

The results of the calculations are presented graphically, where

CP component = $\mathbf{r_{cp}*w_{cp}}$
R* comp = $\mathbf{r_{eur}*w_{eur}+ r_{usd}*w_{usd}}$
Term comp = $\mathbf{t_{eur}*w_{eur}+t_{usd}*w_{usd}}$
Bid/ask spread component = **margin**

The explanatory power of the model is somewhat limited when it comes to the part of Nibor movements being explained by changes in CD quotes. CD quotes are required to be given at least 50 percent weight in the Nibor submissions. However, the data indicates a clear historical correlation between the prices on CDs and NOK borrowing costs calculated from foreign funding costs and foreign exchange term premia (the sum of the Term and R* components), which reflects that both data sources indicate similar NOK funding cost developments.

The model uses information connected to level c-submissions only. As long as the majority of submissions continues to be based on level c, the model will illustrate the factors behind the movements in Nibor. However, if submissions of type a and b become frequent, the model's explanatory power will be reduced.