CONSULTATION: MARKET CONVENTIONS FOR FINANCIAL PRODUCTS REFERENCING NOWA

WORKING GROUP ON ALTERNATIVE REFERENCE RATES FOR THE NORWEGIAN KRONE

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Content

Introduction

Following extensive evaluation of the interbank market and feedback provided by market participants, the working group for alternative reference rates in NOK (ARR) published its recommendation to apply a reformed version of NOWA (Norwegian Overnight Weighted Average) as the alternative reference rate for the Norwegian krone in September 2019. Entering the second phase of the assignment, two sub groups were established shortly thereafter in the endeavour to provide market conventions and fallback solutions for contracts referencing NOWA and investigate the possibilities of implementing an OIS (Overnight-Index Swap) market in NOK.

In this consultation, the ARR working group evaluates a selection of market standards to be applied in contracts referencing NOWA, and offers its preliminary recommendations. Before arriving at the final recommendations on terms of use, the ARR working group seeks input on the proposed methodologies from market participants in this consultation.

Responses and comments can be sent to the secretariat at ARR@norges-bank.no until 1st of September 2020. Based on the feedback given by market participants, the ARR working group will formulate a report with the final recommendations for market conventions for contracts that reference NOWA. The feedback on this consultation will also contribute to the development of a new consultation report on fallback solutions to be applied in contracts referencing NIBOR.

Background

Reference rates plays a crucial role in the financial system. They are used in a wide range of products and loan contracts. In this consultation report on market conventions for NOWA, various issues and alternatives are evaluated, before arriving at the working group's initial recommendations.

Key principles for the group's work on market conventions have been as follows:

- to the greatest extent possible propose the same conventions for NOWA across different products
- to the greatest extent possible align the proposed conventions for NOWA with the recommended conventions used for alternative reference rates in other currencies

As NOWA is nearly "risk-free", while NIBOR includes a spread relating to bank credit risk, NIBOR has historically trended higher than NOWA, which generally hovers around the policy rate. With a policy rate close to zero, there is a notable probability that NOWA, or products linked to NOWA with negative margins, may enter negative territory. This consultation report will not specifically propose conventions for dealing with the specific challenges that negatives rates pose. However, the ARR working group notes that NOWA can turn negative and that the rate calculations proposed in this document are able to deal with the challenges that it would impose.

Shifting from NIBOR to an alternative rate would require a re-consideration in terms of e.g. pricing and cashflow of financial contracts. The working group will ultimately seek consultation on the approach for addressing the specific technical issues associated with adjustments that would apply in the case fallbacks are triggered and contracts would go from referencing NIBOR to instead reference NOWA. The consultation report on fallback provisions will be published after the summer.

Num.	Convention	Explanations and considerations
1.	Day Count Convention	• **Explanation:** NOWA is quoted as an annualized rate with day count convention actual days divided by 365[1]. The number of days in the interest period is calculated by including the first day in the interest period up to, but not including, the last day in the interest period. • **Working group recommendation:** The working group recommends interest payment with NOWA as a reference rate calculated with actual days in the interest period divided by 365 as the day count convention. • ***Question 1:*** ***Does your institution support the recommended day count convention? If not, please explain why this is not your preferred solution, and suggest an alternative solution.***
2.	Business Day Convention	• **Explanation:** If the interest payment date falls on a weekend or on another bank holiday, then the actual payment date needs to be rolled forward or backward. Multiple conventions are available to handle this. • **Following business day:** o If the interest payment day falls on a weekend or on a bank holiday, the payment day is rolled forward to the next business day. • **Modified following business day:**

[1] https://www.norges-bank.no/en/topics/liquidity-and-markets/nowa/principles-for-calculating-and-publishing-nowa/

		○ Same as "Following", but if the next business day falls in the following calendar month, the payment day is rolled backward to the immediately preceding business day. • **Preceding business day:** ○ If the interest payment day falls on a weekend or on a bank holiday, the payment day is rolled backward to the immediately preceding business day. • **Adjusted interest days:** ○ If the interest payment day needs to be rolled forward or backward, the interest accrual days may be adjusted accordingly such that the interest period matches with interest accrual days. This is the normal convention for products using NIBOR as the reference rate. • **Working group recommendation:** The working group recommends that contracts referencing NOWA uses modified following with adjusted interest accrual days as business day convention since this is the standard for contracts with NIBOR as the reference rate. • ***Question 2:*** ***Does your institution support the recommended modified following, adjusted, as the business day convention? If not, please explain why this is not your preferred solution, and suggest an alternative solution.***
3.	Forward-looking or Backward-looking Observations of NOWA Fixings during the Rate Period	• **Explanation:** NOWA is an overnight rate and accrued interest shall therefore be exchanged daily. However, daily exchange of interest is technically and administratively challenging. In order to align the use of NOWA in contracts to mirror conventions using NIBOR as the reference rate, one has two options. One option is to fix the interest rate for the interest period at the start of the period. The other option is to use actual NOWA fixings in the interest period and calculate the weighted average interest rate with payment at the end of the interest period. • **Interest rate calculations based on forward-looking term rates:** ○ The methodology of applying a fixed term NOWA that is set at the beginning of the rate period is the option that corresponds the closest to that of NIBOR. The coupon payment is thus known at the start of the interest period. Since this option aligns with todays' practice

		this would probably be the least challenging option for existing accounting and payment systems. ○ A fixed NOWA for the interest period simplifies liquidity management, especially for smaller enterprises. ○ The development of a forward-looking term rate based on NOWA requires a well-functioning derivatives market structure where OIS-swaps are traded with sufficient liquidity. As of today, no such market exists for the Norwegian krone, as is the case for other currencies as well. Other countries' working groups for alternative reference rates have thus not recommended a forward-looking interest rate as the market convention. ○ A fixing for a forward-looking NOWA will be based on quotes in the derivative market, and to a lesser degree on actual transactions, which is one of the pillars of the introduction of alternative reference rates. With few participant and limited liquidity in the Norwegian derivative market, this will probably be challenging. The other sub working group is looking into how an overnight index swap (OIS) market can be established in Norwegian kroner. They aim to publish a consultation and final report before year end 2020. • **Interest rate calculations based on backward-looking term rates:** ○ All issuance of bonds with a floating interest rate (FRNs) in the market referencing SOFR, SONIA or €STR has used a backward-looking method for calculating the coupon. ○ ISDAs proposed fallback solution for derivative contacts referencing IBOR is based on a backward-looking interest rate calculation. ○ Backward-looking interest rate calculation is based on actual NOWA fixings, which is based on actual transactions and meant to reflect the interest rate level in the market. ○ The interest amount is not known until the end of the interest period after the last NOWA fix. Challenges posed by not knowing the interest amount before the payment day can be solved by different conventions that are further evaluated in this document.

		• **Working group recommendation:** The working group recommends a backward-looking interest rate calculation as it reflects the actual market development of the interest rate level, as opposed to the expected development. Furthermore, a forward-looking term rate requires a well-functioning OIS derivative market, which may be challenging to develop in Norwegian kroner. Backward-looking calculations are also the conventions used as the fallback solution by ISDA in the derivative market[2], and floating rate bond issuance in GBP, USD and EUR. Lately, in the bank lending market, facilities with backward-looking interest rates referencing SONIA and SOFR[3] have been established. • ***Question 3:*** ***Does your institution support backward-looking interest rate calculation as the convention for contracts referencing NOWA? If not, please explain why this is not your preferred solution, and suggest an alternative solution.***
4.	Simple NOWA average or compounded NOWA average	• **Explanation**: To calculate an interest rate for a period longer than one day using daily NOWA fixings, one must choose between a simple or a compounded average. • **Simple average:** ○ A simple average of NOWA fixings is easier to calculate and easier to implement in systems. ○ However, there are few products internationally that use simple average for interest rate calculation. • **Compounded average:** ○ NOWA is a daily rate, so by investing 1 today, you will receive 1 + interest tomorrow. Tomorrow you invest 1+ interest until the day after tomorrow with a new NOWA fix. By using NOWA as reference rate for a period longer than one day without exchanging interest, the most correct approach mathematically will be to use a compounded interest rate average.

[2] https://www.isda.org/2020/05/11/benchmark-reform-and-transition-from-libor/
[3] https://www.bat.com/group/sites/UK__9D9KCY.nsf/vwPagesWebLive/DOBMMDQU

		○ FRNs issued in SONIA and €STR use compounded interest rates and this is also the recommended solution from ISDAs consultation on fallback solutions. ○ For some users a compounded interest rate increases the complexity. One way to reduce this complexity would be if compounded NOWA rates are published by one official source. ○ ARR has sent a letter to the Norwegian Central Bank with an inquiry for them to calculate and publish a NOWA compounded index. • **Working group recommendation:** The working group recommends compounded NOWA average in contracts that reference NOWA. • ***Question 4:*** ***Does your institution support compounded average as the convention for contracts referencing NOWA? If not, please explain why this is not your preferred solution, and suggest an alternative solution.***
5.	Comparison between different methods for calculating the term interest rate	• **Explanation:** When using a backward-looking calculation of the interest rate, the rate is not known until the last NOWA fix at the end of the period. This may lead to administrative challenges for settlements with short notice. To reduce these challenges there are different convention used in the market to increase the time between when the interest rate is known and the actual settlement of payments. . • **Lookback:** ○ The NOWA fix to be used to calculate the interest rate is found by looking back a set number of business days, whereas the day weighting follows the interest period. So far, most of the FRNs issued referencing SONIA or €STR use the lookback convention, normally with a 5 days lookback period. Issuance of FRNs referencing SOFR has so far used different conventions, both lookback with 2 or 5 days, as well as lockout (see below) or a combination of the two methods. By using a 5 days lookback period, the NOWA rate fixing on any day will correspond to the same weekday the previous week. The day-weighting will, in most cases, be correct over weekends, unless there are bank holidays during the 5-day period.

		• **Lockout:**
		  ○ The NOWA fix and day-weighting follows the interest period, except for a set number of days before the interest period ends, where the NOWA fix will be kept unchanged. The interest rate will thus be known a set number of days in advance. Some FRNs referencing SOFR have used this convention, often in conjunction with lookback. If the NOWA fix on the day of the lookout is an outlier in the interest period, this could have a significant impact on the calculated period interest rate.
		
		• **Delayed payment:**
		  ○ The interest payment is delayed a pre-determined number of days after the end of the interest period. This convention is commonly used in the OIS market.
		
		• **Shifted observation period:**
		  ○ The shifted observation period convention is closely linked to the lookback convention. Both methods use the NOWA fix a set number of days back, but where the lookback convention uses the day weightings in the interest period, the shifted observation period also shifts the day weightings back the same set number of days. This convention ensure that the weight given to every NOWA fix is "correct", i.e. it takes holidays into account with the correct day weighting. This convention is also ISDAs fallback solution[4] for derivatives given an IBOR cessation. If the administrator of NOWA decides to publish a NOWA index, like FED NY does for SOFR[5] and BoE is planning to do for SONIA[6], this convention will make it possible to use that NOWA index to calculate compounded interest rates for products referencing NOWA.
		
		• **Working group recommendation:**
		The working group recommends the shifted observation period convention. This convention gives the correct weightings to the NOWA fixings and also ensures that a potential NOWA index can be utilized for calculation of compounded interest rates.

[4] https://www.isda.org/a/Ua0TE/Consultation-on-Parameters-for-Fallback-Adjustments.pdf
[5] https://www.newyorkfed.org/markets/opolicy/operating_policy_200212
[6] https://www.bankofengland.co.uk/paper/2020/supporting-risk-free-rate-transition-through-the-provision-of-compounded-sonia

		• ***Question 5:*** ***Does your institution support the shifted observation period as the convention for contracts referencing NOWA? If not, please explain why this is not your preferred solution, and suggest an alternative solution.***
6.	Notification period for interest payments	• **Explanation:** Given a backward looking interest rate calculation for NOWA, the period interest rate will be known a set number of days before the last day of the interest period. To execute a payment the same day as the interest amount is known, can be challenging. This has led to the development of conventions that enable the interest amount to be known a set number of days ahead of the payment day. The most common notification periods are 2 or 5 days before the payment of the interest amount. Please note that notification period in this context means the number of lockout days, the number of lookback days or the number of days for observation shift in the conventions discussed above (5). • **Notification period of 2 business days:** ISDA recommends a shifted observation period with 2 business days shift as the fallback solution. This enables a notification period of 2 business days. ARRCs FRN working group describes how FRNs can be aligned to derivatives with 2 days observation shift[7]. • **Notification period of 5 business days:** For some products a notification period of 2 business days can be too short to accommodate an interest payment in the payment systems. The convention mostly used in the bond market in GBP referencing SONIA has so far been 5 days lookback which gives rise to a 5 day notification period. • **Working group recommendation:** The two abovementioned notification periods are the most frequently observed in the market across products, while more options exists. In the high yield (HY) market in Norway it is common that the issuer has to make the interest amount available 3 days before the actual payment day. The key principle of the working group have been to propose, to the greatest extent possible, the same conventions for NOWA across different products and to align with recommended conventions in other currencies. With the recommended convention for ISDA being a 2 business days shifted

[7] Footnote 8 in https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2020/Statement_on_SOFR_Index.pdf

		observation period for their fallback solution and since derivatives are being used in combination with both loans and bonds, the recommendation from the working group is to mirror that convention. It is also worth noting that in a period with volatile interest rate levels a notification period that deviates from the interest period, could potentially have a significant impact on the calculated period interest rate. • ***Question 6:*** ***Does your institution support a 2 business day notification period as the convention for contracts referencing NOWA? If not, please explain why this is not your preferred solution, and suggest an alternative solution.***
7.	Treatment of Margin over NOWA	• **Explanation:** The margin, which could be positive or negative, to be added to NOWA for loans, bonds or derivatives can either be added to daily NOWA fixings and then compounded, or added to the compounded NOWA at the end of the interest period. • **Adding the margin at the end of the compounded interest period:** o The daily compounding of the margin will lead to changes in the current margin levels. It is easier to compare margins across transactions if the compounded reference rate and the margin are kept separate. o A compounded margin increases the complexity of the interest rate calculation. o Most interest rate derivatives do not contain a margin over the reference rate. A compounded margin will complicate the use of interest rate derivatives in combination with loans or bonds. o So far issuance of bonds referencing SONIA and €STR have added the margin to the compounded reference rate. • **Working group recommendation:** The working group recommends adding the margin to the compounded NOWA, i.e. not compounding the margin • ***Question 7:***

		Does your institution support adding the margin to the compounded NOWA (i.e. not compounding the margin) as the convention for contracts referencing NOWA? If not, please explain why this is not your preferred solution, and suggest an alternative solution.

Other questions

In the table above different challenges and solutions to market conventions for the use of NOWA in financial products are discussed. The working group has given its initial recommendation for each topic. The recommendations are based on the key principles of to the greatest extent possible, to propose the same conventions for NOWA across different products and to align with recommended conventions in other currencies.

Question 8:

Are there any market conventions for the use of NOWA as a reference rate in financial products that have not been discussed in this consultation?

Annex

Below are examples of 3 different calculations for a backward-looking interest rate with a 5 days notification period. The 3 most common methods are lockout, lookback and observation shift. The examples below show the different conventions used in calculations for a hypothetical 1 month interest period from the 20th of March 2020 to the 20th of April 2020.

1. Lockout with the calculation of the period interest rate 5 days before the end of interest period. I.e. NOWA is kept unchanged the 5 last days of the interest period:

Interest period start	20-Mar-20			
Interest period end	20-Apr-20			
Days in interest period	31			
Days in observation period	19			
Lockout days	5			
Interest period	**Observation period**	**NOWA observations**	**Reference rate**	**Compound factor**
Friday, March 20, 2020	Friday, March 20, 2020	0.99	0.99	1
Monday, March 23, 2020	Monday, March 23, 2020	0.24	0.24	1.00008137
Tuesday, March 24, 2020	Tuesday, March 24, 2020	0.24	0.24	1.000087946
Wednesday, March 25, 2020	Wednesday, March 25, 2020	0.24	0.24	1.000094522
Thursday, March 26, 2020	Thursday, March 26, 2020	0.24	0.24	1.000101098
Friday, March 27, 2020	Friday, March 27, 2020	0.24	0.24	1.000107674
Monday, March 30, 2020	Monday, March 30, 2020	0.24	0.24	1.000127402
Tuesday, March 31, 2020	Tuesday, March 31, 2020	0.24	0.24	1.000133978
Wednesday, April 1, 2020	Wednesday, April 1, 2020	0.25	0.25	1.000140554
Thursday, April 2, 2020	Thursday, April 2, 2020	0.25	0.25	1.000147404
Friday, April 3, 2020	Friday, April 3, 2020	0.25	0.25	1.000154255
Monday, April 6, 2020	Monday, April 6, 2020	0.24	0.24	1.000174806
Tuesday, April 7, 2020	Tuesday, April 7, 2020	0.25	0.25	1.000181382
Wednesday, April 8, 2020	Wednesday, April 8, 2020	0.25	0.25	1.000188233
Tuesday, April 14, 2020	Wednesday, April 8, 2020	0.24	0.25	1.000229337
Wednesday, April 15, 2020	Wednesday, April 8, 2020	0.24	0.25	1.000236187
Thursday, April 16, 2020	Wednesday, April 8, 2020	0.24	0.25	1.000243038
Friday, April 17, 2020	Wednesday, April 8, 2020	0.24	0.25	1.000249889
Monday, April 20, 2020				1.000270442
		Compounded term rate		**0.3184%**

2. Lookback with the calculation of the period interest rate 5 days before the end of interest period. I.e. for a given day in the interest period, use the NOWA fix observed 5 business days back.

Interest period start	20-Mar-20			
Interest period end	20-Apr-20			
Days in interest period	31			
Days in observation period	31			
Lookback days	5			
Interest period	**Observation period**	**NOWA observations**	**Days**	**Compound factor**
Friday, March 20, 2020	Friday, March 13, 2020	1.49	3	1
Monday, March 23, 2020	Monday, March 16, 2020	0.99	1	1.000122466
Tuesday, March 24, 2020	Tuesday, March 17, 2020	0.99	1	1.000149592
Wednesday, March 25, 2020	Wednesday, March 18, 2020	0.99	1	1.00017672
Thursday, March 26, 2020	Thursday, March 19, 2020	0.99	1	1.000203848
Friday, March 27, 2020	Friday, March 20, 2020	0.99	3	1.000230977
Monday, March 30, 2020	Monday, March 23, 2020	0.24	1	1.000312365
Tuesday, March 31, 2020	Tuesday, March 24, 2020	0.24	1	1.000318943
Wednesday, April 1, 2020	Wednesday, March 25, 2020	0.24	1	1.00032552
Thursday, April 2, 2020	Thursday, March 26, 2020	0.24	1	1.000332098
Friday, April 3, 2020	Friday, March 27, 2020	0.24	3	1.000338675
Monday, April 6, 2020	Monday, March 30, 2020	0.24	1	1.000358408
Tuesday, April 7, 2020	Tuesday, March 31, 2020	0.24	1	1.000364986
Wednesday, April 8, 2020	Wednesday, April 1, 2020	0.25	6	1.000371563
Tuesday, April 14, 2020	Thursday, April 2, 2020	0.25	1	1.000412674
Wednesday, April 15, 2020	Friday, April 3, 2020	0.25	1	1.000419527
Thursday, April 16, 2020	Monday, April 6, 2020	0.24	1	1.000426379
Friday, April 17, 2020	Tuesday, April 7, 2020	0.25	3	1.000432957
Monday, April 20, 2020	Wednesday, April 8, 2020	0.25		1.000453514
		Compounded term rate		**0.5340%**

3. Observation shift is closely linked to lookback, but with different day weighting when a holiday falls in the interest period (i.e. it is more "correct").

Interest period start	20-Mar-20			
Interest period end	20-Apr-20			
Days in interest period	31			
Days in observation period	26			
Number of shifted days	5			
Interest period	**Observation period**	**NOWA observations**	**Days**	**Compound factor**
Friday, March 20, 2020	Friday, March 13, 2020	1.49	3	1
Monday, March 23, 2020	Monday, March 16, 2020	0.99	1	1.000122466
Tuesday, March 24, 2020	Tuesday, March 17, 2020	0.99	1	1.000149592
Wednesday, March 25, 2020	Wednesday, March 18, 2020	0.99	1	1.00017672
Thursday, March 26, 2020	Thursday, March 19, 2020	0.99	1	1.000203848
Friday, March 27, 2020	Friday, March 20, 2020	0.99	3	1.000230977
Monday, March 30, 2020	Monday, March 23, 2020	0.24	1	1.000312365
Tuesday, March 31, 2020	Tuesday, March 24, 2020	0.24	1	1.000318943
Wednesday, April 1, 2020	Wednesday, March 25, 2020	0.24	1	1.00032552
Thursday, April 2, 2020	Thursday, March 26, 2020	0.24	1	1.000332098
Friday, April 3, 2020	Friday, March 27, 2020	0.24	3	1.000338675
Monday, April 6, 2020	Monday, March 30, 2020	0.24	1	1.000358408
Tuesday, April 7, 2020	Tuesday, March 31, 2020	0.24	1	1.000364986
Wednesday, April 8, 2020	Wednesday, April 1, 2020	0.25	1	1.000371563
Tuesday, April 14, 2020	Thursday, April 2, 2020	0.25	1	1.000378415
Wednesday, April 15, 2020	Friday, April 3, 2020	0.25	3	1.000385267
Thursday, April 16, 2020	Monday, April 6, 2020	0.24	1	1.000405823
Friday, April 17, 2020	Tuesday, April 7, 2020	0.25	1	1.000412401
Monday, April 20, 2020	Wednesday, April 8, 2020	0.25		1.000419253
		Compounded term rate		**0.5886%**

For the same interest period, depending on the chosen convention, we will have an interest rate that varies by 27.21 bps in this example. This illustrates that it is important that products that are mutual depend on each other, like for example loans and interest rate derivatives, use the same conventions.