NASDAQ CIBOR™ 3 & 6 MONTH CONTRACT

The Nasdaq CIBOR™ 3/6 Month Contract constitutes a valuable tool in management of short-term interest rate risk. Contract base is 3 or 6-month CIBOR™. The contract has standardized start dates that always occur on IMM days. This means that trading is concentrated to a limited number of interest periods, which benefits liquidity and gives this OTC product the advantages of a listed contract.

Facts about Nasdaq CIBOR™ 3 & 6 Month Contract

<table>
<thead>
<tr>
<th>Contract type</th>
<th>Forward contract with daily shifting of variation margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract base</td>
<td>3 or 6 month Copenhagen Interbank Offered Rate, CIBOR™</td>
</tr>
<tr>
<td>Contract base size</td>
<td>Nominal value of DKK 1,000,000</td>
</tr>
<tr>
<td>Listing</td>
<td>Clearing listing</td>
</tr>
<tr>
<td>Trading</td>
<td>Trading is done over the counter (OTC)</td>
</tr>
<tr>
<td>Maturity</td>
<td>Up to 3 years</td>
</tr>
<tr>
<td>Trade Price</td>
<td>Price expressed as simple interest rate with an act/360 day count convention</td>
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<tr>
<td>Fix</td>
<td>The fixing of 3 and 6-month CIBOR™ is established two days prior to expiration day at 11.00 CET</td>
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<tr>
<td>Term</td>
<td>Three or Six months</td>
</tr>
<tr>
<td>Expiration months</td>
<td>March, June, September and December</td>
</tr>
<tr>
<td>Expiration day</td>
<td>The third Wednesday of the expiration month</td>
</tr>
<tr>
<td>Cash settlement day</td>
<td>On the expiration day</td>
</tr>
<tr>
<td>Cash Settlement</td>
<td>Cash Settlement Shall occur on the expiration day through the determination of a settlement amount based upon the Trade Price and Fix</td>
</tr>
<tr>
<td>Shifting of variation margin</td>
<td>The contracts will have a daily shift of the variation margin between the purchaser and seller. The posted variation margin will be interest compensated with the previous Bank Day T/N CIBOR™ rate and the received variation margin will be charged interest with the previous Bank Day T/N CIBOR™ rate</td>
</tr>
<tr>
<td>Offseting</td>
<td>No offsetting</td>
</tr>
<tr>
<td>Netting</td>
<td>It is possible to net notionals through manual netting</td>
</tr>
</tbody>
</table>

Market model

Trading is done over the counter (OTC). All trades are centrally cleared by Nasdaq Clearing AB (the “Clearinghouse”).
Clearing Registration

Trades can be sent to Nasdaq Clearing via MarkitWire. Registration is also enabled via Nasdaq supplied front-end Clearing Workstation or via OMnet API. For more information about technical protocols and Genium Inet Front-Ends please visit https://www.nasdaq.com/solutions

Offsetting and Manual Netting

It is not possible to automatically offset the contract, so any purchased and sold contracts in same series will contribute to building notionals with the clearing house. The notionals in the portfolio can although be significantly decreased by active use of the manual netting service that Nasdaq Clearing offers.

Manual netting of contracts is done by the clearing member who enters a netting request in the clearing system. It can be done on behalf of customers or own account. The following three scenarios are covered by the manual netting service:

- Full Netting with Equal Rate
- Partial Netting with Equal Rate
- Partial Netting with Mixed Rates

For more information on netting please consult the “Compression service and manual netting” document available online alongside the product guides or contact the Fixed Income team.

Variation Margin and Cash Settlement

For information about the margining methodology, please see the Cash Flow Margin (CFM) model guide here: https://www.nasdaq.com/solutions/nasdaq-clearing-margining-methodology

Shifting of the variation margin delta on each trade takes place daily on bank days.

The market valuation is a done in a dual curve framework. The forecasting of the floating cash flow is done using a forward fixing rate curve. Both cash flows are then discounted using a discount factor curve constructed using OIS quotes for the period from the end of the interest rate period to the current settlement date. The sum of all NPVs gives the NPV of the contract.

\[
NPV = Side \times N \times \delta \times d_{OIS}(0, t_e) \times (R - F(t))
\]

Where

- \(t\) Trade Date
- \(t_s\) Start Date
- \(t_e\) End Date
- \(N\) Notional Amount
- Side \((1\) if the IMM FRA is sold\(\neg 1\) if the IMM FRA is bought\)
- \(\delta\) The Day Count Fraction for the interest rate period
- \(R\) Fixed contracted rate (Trade Price) of the Nasdaq CIBOR™ 3/6 Month Contract
- \(d_{OIS}(0, t)\) The discount factor curve constructed from the T/N CIBOR™ deposit
- \(F(t)\) The forward fixing rate curve
**Cash settlement of the final amount** is done on the Start Day and is determined based upon the difference between the Trade Price and the Fix (3 or 6-month CIBOR™).

The following formula shall be used when calculating the settlement amount:

\[
B = \frac{d}{360} \cdot (s - r) \cdot N \cdot \frac{1}{1 + \frac{s \cdot d}{360}}
\]

Where

- **B** Settlement Amount
- **d** Number of days in the interest rate period
- **r** Trade Price in decimal form, 0.500% shall be expressed as 0.00500
- **s** Fix in decimal form, 0.550% shall be expressed 0.00550
- **N** Notional Amount

**Example of expiration cash settlement for a Nasdaq CIBOR™ 3 Month Contract with Start Day in September 2018**

On 2018-07-23 a contract with notional amount of DKK 100 million is bought at 0.500%. Fixing date is two days prior to September IMM, on 2018-09-17 and 3-month CIBOR™ fixes at 0.550% on that date. The Interest rate period of the contract (number of days between IMM 2018-09-19 and following IMM 2018-12-19) is 91 days.

**Calculation of settlement amount:**

\[
\frac{91}{360} \cdot (0.0055 - 0.005) \cdot 100\,000\,000 \cdot \frac{1}{1 + \frac{0.0055 \cdot 91}{360}} = 12\,621,34
\]

Settlement Amount for a bought 100 million contract is equal to DKK 12 621,34