

### Index rulebook

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#### What is the Nomura Crude Oil Index?

- The Nomura Crude Oil Index is an index designed to track movements in crude oil prices.
- The index mimics the performance of investments in crude oil futures and incorporates a rollover mechanism to enable investment that tracks the index.

#### Primary changes

- [October 2016] Change to QUICK code in “5. Data publication services”
- [October 2020] Change to Crude Oil Long Index calculation method
- [November 2020] Change to QUICK code in “5. Data publication services”

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# 1. Introduction

The Nomura Crude Oil Index is an index designed to track movements in crude oil prices. The index mimics the performance of investments in crude oil futures and incorporates a rollover mechanism to enable investment that tracks the index<sup>1</sup>.

## 2. Index constituents

The index comprises NYMEX WTI Light Sweet Crude Oil futures, which are listed on the New York Mercantile Exchange (NYMEX).

Contract months of the futures contracts used to calculate the index are as follows<sup>2</sup>.

Date	Contract months of futures contracts used
Most recent reconstitution date <sup>(*)</sup> $\leq$ calculation date $\leq$ reconstitution base date immediately after most recent reconstitution date <sup>(*)</sup>	3rd, 4th, and 5th contract months
Reconstitution base date immediately after most recent reconstitution date <sup>(*)</sup> $<$ calculation date $<$ next reconstitution date <sup>(*)</sup>	2nd, 3rd, and 4th contract months

(\*) See “3. Index reconstitution” for details.

Index constituents are changed only on reconstitution dates.

<sup>1</sup> The Nomura Crude Oil Index tracks crude oil futures prices, but diverges from the price, referred to by news outlets, that simply represents the futures price for the latest front month contract. Futures contracts have expiration dates and the price used by news outlets when they discuss market conditions is based on the futures contract with an expiration date that is closest to the current date (ie, the front month contract). When the front month contract approaches maturity, news outlets switch to reporting the price of the next futures contract, ie, the contract with an expiration date that is the next-closest to the current date. At this point, if the price of the next futures contract is higher (or lower) than the price of the expiring futures contract, the futures price that is quoted by news outlets appears to rise (or fall) sharply. Futures contracts have a time value, and generally speaking this time value is larger the further the contract is from expiry. This means that when the price switches from one contract to the next it tends to rise, rather than fall. However, investment in crude oil futures is investment in futures contracts that have expiration dates, and therefore at some point it is necessary to sell the front month contract and buy a back month contract (this process is called “rolling over”). Because, on average, the price of a contract in a further-out month tends to be higher than the price of the front month contract, the volume of contracts held will tend to decline following rollover if the size of the investment remains the same. The futures price quoted by news outlets appears to jump when the front month contract expires and is replaced by another front month contract. However, because the size of the investment remains the same, this switch in front month contracts results in a divergence between fluctuations in the futures price quoted by news outlets and fluctuations in the assets invested.

<sup>2</sup> Effective from November 2020.

## 3. Index reconstitution<sup>2</sup>

### 3.1 Index reconstitution date

If the fifth business day on NYMEX after the last day of trading is a business day in Tokyo, the index reconstitution date is the fifth business day on NYMEX after the last day of trading. However, if the fifth business day on NYMEX after the last day of trading is not a business day in Tokyo, the index reconstitution date is the next day, after the fifth business day on NYMEX after the last day of trading, that is both a business day on NYMEX and a business day in Tokyo.

### 3.2 Index reconstitution base date

The last day of trading each month is the index reconstitution base date. The volume of the index constituent used to calculate the index, for each index constituent, is based on the value for index calculation purposes on the reconstitution base date (\*2) and the price of the index constituent after the next reconstitution on the reconstitution base date. The volume of the index constituent used to calculate the index does not change up to the next reconstitution.

(\*2) See “4.2 Calculation method” for value for index calculation purposes.

- A "business day in Tokyo" is defined here as a day on which commercial banks in Tokyo settle payments.
- The "next day, after the fifth business day on NYMEX, that is both a business day on NYMEX and a business day in Tokyo" is defined here as the first business day on NYMEX after the fifth business day on NYMEX that is also a business day in Tokyo.
- The "last day of trading" is defined here as the day that is three business days on NYMEX before the 25th day of each month. However, if the 25th day of the month is not a business day on NYMEX, the "last day of trading" is defined here as the day that is three business days on NYMEX before the business day on NYMEX before the 25<sup>th</sup> day of the month.

## 4. Nomura Crude Oil Long Index calculation method

### 4.1 Index base date and index base value

The index base date is 31 December 2008 and the base value for the index is 1,000.

### 4.2 Calculation method

Nomura Crude Oil Long Index values are calculated using the method set out below<sup>3</sup>

Index value  $(t) = (1 + \text{return}(t)) \times \text{index value}(t-1)$

$$\text{Return}(t) = \frac{\sum_{i \in \text{index constituent}(t)} \text{Volume used to calculate index}_i(T(t)) \times \text{price}_i(t)}{\sum_{i \in \text{index constituent}(t)} \text{Volume used to calculate index}_i(T(t)) \times \text{price}_i(t-1)} - 1$$

$$\begin{aligned} \text{Volume used to calculate index}_i(T(t)) \\ = \frac{\text{value for index calculation purposes}(T_0(t))}{3} \div \text{price}_i(T_0(t)) \quad i \in \text{index constituent}(t) \end{aligned}$$

Value for index calculation purposes  $(T_0(t))$

$$= \sum_{i \in \text{index constituent}(T(t))^{(*3)}} \text{Volume used to calculate index}_i(T'(t)) \times \text{price}_i(T_0(t))$$

- $t$  : calculation date (business day on NYMEX)
- $t-1$  : business day preceding  $t$  on NYMEX
- $T(t)$  : reconstitution date immediately preceding  $t$
- $T'(t)$  : reconstitution date immediately preceding  $T(t)$
- $T_0(t)$  : reconstitution base date immediately preceding  $T(t)$
- $\text{price}_i(s)$  : settlement price of index constituent  $i$  on NYMEX at time  $s$  (price per barrel in USD)<sup>4</sup>
- $\text{index constituent}(t)$ : futures contracts for 3rd, 4th, and 5th contract months at time  $T(t)$ <sup>(\*4)</sup>
- Volume used to calculate index  $T(t)$ : volume of index constituent  $i$  used to calculate the index at time  $T(t)$
- Value for index calculation purposes  $T_0(t)$ : total of [volume of index constituent  $i$  used to calculate index at time  $T'(t)$ ]  $\times$  [price of index constituent  $i$  at time  $T_0(t)$ ] for index constituent  $(T(t))$

(\*3) Futures contracts for 3rd, 4th, and 5th contract months at time  $T'(t)$

(\*4) Futures contracts for 4th, 5th, and 6th contract months at time  $T_0(t)$ , and 2nd, 3rd, and 4th contract months after index reconstitution base date immediately after time  $T(t)$

<sup>3</sup> Effective from 30 November 2020.

<sup>4</sup> If for some reason the price cannot be used or if use of the price is considered to be extremely inappropriate, the price may be determined with reference to the price on the preceding business day on the exchange on which index constituent  $i$  is listed, the price of a similar commodity future, or the market traded price.

## 5. Data publication services

Data for the Nomura Crude Oil Long Index can be obtained via the following channels.<sup>5</sup>

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**Index values are published in the following media:**

Bloomberg : NMLSCOIL Index

QUICK : SOIL#/L/NRIN<sup>6</sup>

LSEG : .NCOILL

Our website : <https://www.nfrc.co.jp/SMI/jp/oil/index.html> (Japanese only)

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<sup>5</sup> Published data are all for reference only.

<sup>6</sup> Effective from 30 November 2020.

## For further information on the index

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