

Nikkei 225 Leveraged Index  
Nikkei 225 Inverse Index  
Nikkei 225 Double Inverse Index  
Real-time version  
Index Guidebook

Nikkei Inc.

- This document is the index guidebook of the Nikkei 225 Leveraged Index, the Nikkei 225 Inverse Index and the Nikkei 225 Double Inverse Index calculated and published by Nikkei Inc (Nikkei). The document is drawn up by Nikkei and it would be changed or modified corresponding to the revision of the index calculation rule etc.
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- This English document is a translation of the original document dated June 16, 2014 in Japanese and may not be an entirely accurate translation of the original Japanese document. In any case where differences arise between the English version and the original Japanese version, the original Japanese document will prevail.

(July 18, 2017 version)

## 1: Concept

The Nikkei 225 Leveraged Index represents the doubled performance of the Nikkei Stock Average (Nikkei 225), the Nikkei 225 Inverse Index represents the inverse performance of the Nikkei 225 and the Nikkei 225 Double Inverse Index represents the doubled inverse performance of Nikkei 225.

For instance, if the Nikkei 225 rises by 5% from the closing price of the previous day, the Leveraged Index rises by 10% for the same period, the Inverse Index falls by 5% and the Double Inverse Index falls by 10%. Similarly, Nikkei 225 falls by 5% from the closing price of the previous day, the Leveraged Index falls by 10% for the same period, the Inverse Index rises by 5% and the Double Inverse Index rises by 10%.

## 2: Calculation method

### (1) Basic points

- Unit of the index value is “points” and the figure is rounded to two decimal places.
- Index values of the Nikkei 225 Leveraged Index and the Nikkei 225 Inverse Index on December 28, 2001 were 10,000 points.
- Index value of the Nikkei 225 Double Inverse Index on December 28, 2001 was 100,000 points.

### (2) Index Calculation

- The Nikkei 225 Leveraged Index, the Nikkei 225 Inverse Index and the Nikkei 225 Double Inverse Index are designed to represent the doubled, inverse and doubled inverse performances of the Nikkei 225 respectively. Therefore, the each index value is calculated by multiplying the closing value of the index on the previous day by the current return based on the current change rate of the Nikkei 225 from the previous day.
- The indices have been calculated at 5-second intervals during the trading hours of the Tokyo Stock Exchange. From July 23, 2012 to July 14, 2017, those indices were calculated in every 15 seconds (as for the Nikkei 225 Double Inverse Index from June 16, 2014). Also the Nikkei 225 Leveraged Index and the Nikkei 225 Inverse Index had been calculated and published on end-of-day basis from June 6, 2011 until July 20, 2012.

### (3) Formula

$$\text{Index Value (current value)} = \text{Index Value (closing value on previous day)} \\ \times \left\{ 1 + \alpha \times \left( \frac{\text{Nikkei 225 (current value)}}{\text{Nikkei 225 (closing value on previous day)}} - 1 \right) \right\}$$

\* Closing value of the index is calculated by using the closing price of Nikkei 225 on the current day for “Nikkei 225 (current value)”.

When:

- Nikkei 225 Leveraged Index :  $\alpha = 2$
- Nikkei 225 Inverse Index :  $\alpha = -1$
- Nikkei 225 Double Inverse Index :  $\alpha = -2$

### 3: Calculation Example (the value at 15 seconds after 9:00 am on March 31, 2014)

\* In the following examples, “current day” was March 31, 2014 and “previous day” was March 28, 2014. These are just examples as the actual publication starts from June 16, 2014.

#### (1) Nikkei 225 Leveraged Index

- Nikkei 225 Leveraged Index (closing value on previous day) = 9,253.21
- Nikkei 225 (closing value on previous day) = 14,696.03
- Nikkei 225 (current value at 9:00:15 am on current day) = 14,839.54

$$\text{Nikkei 225 Leveraged Index (current value at 9:00:15 am on current day)} \\ = 9,253.21 \times \left\{ 1 + 2 \times \left( \frac{14,839.54}{14,696.03} - 1 \right) \right\} = 9,433.92930\dots \approx \underline{\underline{9,433.93}}$$

#### (2) Nikkei 225 Inverse Index

- Nikkei 225 Inverse Index (closing value on previous day) = 3,454.02
- Nikkei 225 (closing value on previous day) = 14,696.03
- Nikkei 225 (current value at 9:00:15 am on current day) = 14,839.54

$$\text{Nikkei 225 Inverse Index (current value at 9:00:15 am on current day)} \\ = 3,454.02 \times \left\{ 1 + (-1) \times \left( \frac{14,839.54}{14,696.03} - 1 \right) \right\} = 3,420.29072\dots \approx \underline{\underline{3,420.29}}$$

#### (3) Nikkei 225 Double Inverse Index

- Nikkei 225 Double Inverse Index (closing value on previous day) = 5,744.49
- Nikkei 225 (closing value on previous day) = 14,696.03
- Nikkei 225 (current value at 9:00:15 am on current day) = 14,839.54

$$\text{Nikkei 225 Double Inverse Index (current value at 9:00:15 am on current day)}$$

$$= 5,744.49 \times \{1 + (-2) \times (14,839.54 / 14,696.03 - 1)\} = 5,632.29755... \approx \underline{5,632.30}$$

#### **4: Treatment of the index value**

##### **(1) Retroactively Calculation in the past**

The Nikkei 225 Leveraged Index and the Nikkei 225 Inverse Index were calculated retroactively dating back from the base date of these indices (December 28, 2001=10,000 points) to June 3, 2011 on the end-of-day basis. Also the Nikkei 225 Double Inverse Index was calculated retroactively dating back from the base date of the index (December 28, 2001=100,000 points) to June 13, 2014 on the end-of-day basis.

##### **(2) Modification of the index value**

If the Nikkei Stock Average (Nikkei 225) used to calculate the Nikkei 225 Leveraged Index and the Nikkei 225 Inverse Index will be modified retroactively, these indices may also be modified retroactively.

#### **5: Others**

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### (3)Contact

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## Appendix : Change history of Index Guidebook

July 23, 2012 version	Initial version
May 28, 2014 version	Add the description for the Nikkei 225 Double Inverse Index and modify the example for the index values at 15 second after 9:00 am on March 31, 2014 in “3:Calculation Example”
July 18, 2017 version	Due to the calculation intervals change(every 5 sec.), revise the description in “2:Calculation method (2)Index Calculation”