



JPX-Nikkei 400 Currency Hedged Index Guidebook

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JPX Market Innovation & Research, Inc.
Nikkei Inc.

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(Reference Translation)

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Record of Changes

DATE	Changes
Jan 16, 2015	First edition
Feb 9, 2015	Revised the calculation methodology to determine the amount of foreign exchange forward contracts based on the index level one business day prior to the month-end rebalance, whereas it is currently determined based on the index level at the end of the month (This revision has been effective since March 2, 2015)
May 15, 2015	Added the following 2 indices. <ul style="list-style-type: none">• JPX-Nikkei 400 Net Total Return CHF Hedged Index• JPX-Nikkei 400 Net Total Return Daily CHF Hedged Index
Feb 13, 2023	Added revisions with regard to the business transfer to JPXI (applied on April 1, 2022 retroactively)

1. Introduction

- JPX Market Innovation & Research, Inc. (JPXI) and Nikkei Inc. (Nikkei) (hereinafter JPXI and Nikkei are collectively referred to as “the Index Provider”) calculate and publish JPX-Nikkei Index 400 with currency risk hedging (hereafter “Currency Hedged Indices”) in accordance with the methods described in this document. If an event not specified in this document occurs, or if the Index Provider determines that it is difficult to use the methods described in this document, the Index Provider may use an alternative method of index calculation as it deems appropriate.
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2. Outline of the Index

(1) Outline

- The Currency Hedged Indices are designed to represent returns for those global index investment strategies that involve hedging currency risk, but not the underlying constituent risk.
- The Currency Hedged Indices are calculated by hedging the index portfolio using rolling one-month forward contracts. The hedge ratio is the proportion of the portfolio's currency exposure that is hedged. Currency Hedged Indices use a hedge ratio of 100%, thus removing the currency risk of the index portfolio. Note that since only balances on the certain date are hedged, the index does not assume a perfect hedging of currency movements.
- The indices with daily currency hedging differ from the standard currency hedged indices in that the amount of the forward contracts maturing at the end of month is adjusted on a daily basis according to the performance of the underlying index.

(2) Target indices used for calculating Currency Hedged Indices

- The following indices are used for calculating Currency Hedged Indices.

Target Indices	Currency
JPX-Nikkei 400 Net Total Return Index	Euro
JPX-Nikkei 400 Net Total Return Index	US Dollar
JPX-Nikkei 400 Net Total Return Index	GB Pound
JPX-Nikkei 400 Net Total Return Index	Swiss Franc

- The following indices are used for calculating Daily Currency Hedged Indices.

Target Indices	Currency
JPX-Nikkei 400 Net Total Return Index	Euro
JPX-Nikkei 400 Net Total Return Index	US Dollar
JPX-Nikkei 400 Net Total Return Index	GB Pound
JPX-Nikkei 400 Net Total Return Index	Swiss Franc

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3. Calculation Method

- The Currency Hedged Indices assume hedging of 100% of the index portfolio using one-month currency forwards at the end of each month.
- Daily index return (i.e. the index value) is calculated by the combination of the following two returns:
 - (1) Target index return in the foreign currency, which is the return accruing from an unhedged Target index investment to an investor whose home currency is not Japanese Yen.
 - (2) The return from the hedge, calculated by a linear interpolation of spot and forward prices.

For the changes of the Number of shares for index calculation and Base Market Value, the “JPX-Nikkei Index 400 Guidebook” is applied and uses the same data for Target indices. The same is also applied to the prices for index calculation

- Based on the index level on the index rebalance reference date¹, which occurs on the business day prior to the end of the month, the rebalance forward amounts are determined.
- The base point and base date of indices are following.

Index	Base Date	Base Point
JPX-Nikkei 400 Net Total Return EUR Hedged Index	Aug 30, 2013	10,000.00
JPX-Nikkei 400 Net Total Return USD Hedged Index	Aug 30, 2013	10,000.00
JPX-Nikkei 400 Net Total Return GBP Hedged Index	Aug 30, 2013	10,000.00
JPX-Nikkei 400 Net Total Return CHF Hedged Index	Aug 30, 2013	10,000.00
JPX-Nikkei 400 Net Total Return Daily EUR Hedged Index	Aug 30, 2013	10,000.00
JPX-Nikkei 400 Net Total Return Daily USD Hedged Index	Aug 30, 2013	10,000.00
JPX-Nikkei 400 Net Total Return Daily GBP Hedged Index	Aug 30, 2013	10,000.00
JPX-Nikkei 400 Net Total Return Daily CHF Hedged Index	Aug 30, 2013	10,000.00

¹ The end of month is used as the index rebalance reference date through to index calculation for the end of February 2015. Retroactive data is calculated in the same way.

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- The Index Provider uses WM/Refinitiv rate at 4 p.m. UK time in principle for Currency Hedged Index calculation.
- Index Computation as follows:

For each month m , there are $d = 1, 2, 3, \dots, D$ calendar days. md is day d for month m and $m0$ is the last day of the month $m-1$. $mr0$ is one business day prior to the last day of the month $m-1$, i.e. the index rebalance reference date.

EH = the Currency-Hedged Index level

MAF_m = Monthly Index Adjustment Factor for month m to account for the index performance of the Currency-Hedged Index

$$MAF_m = \left(\frac{EH_{mr0}}{EH_{m0}} \right)$$

E = the Target index level, in foreign currency

EL = the Target index level, in JPY

HR = hedge return (%)

S = spot rate in JPY per foreign currency

F = forward rate in JPY per foreign currency

$F_{I_{md}}$ = the interpolated forward rate as of day d of month m

$$F_{I_{md}} = S_{md} + \left(\frac{D - d}{D} \right) * (F_{md} - S_{md})$$

AF_{md} = the adjustment factor for daily hedged indices as of day d of month m

$$AF_{md} = \frac{EL_{md-1}}{EL_{m0}}$$

For the day d of month m

$$EH_{md} = EH_{m0} * \left[\frac{E_{md}}{E_{m0}} + HR_{md} \right]$$

where

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$$E_{md} = \frac{EL_{md}}{S_{md}}$$

$$HR_{md} = \left\{ \frac{S_{mr0}}{F_{m0}} - \frac{S_{mr0}}{S_{md} + \left(\frac{D-d}{D} \right) * (F_{md} - S_{md})} \right\} * MAF_m = \left(\frac{S_{mr0}}{F_{m0}} - \frac{S_{mr0}}{F - I_{md}} \right) * MAF_m$$

- The hedge return for indices with daily currency hedging is calculated as follows:

when day d is not the last business day of month m ,

$$HR_{md} = \sum_{i=1}^d AF_{mi} \times \left(\frac{S_{m0}}{F - I_{mi-1}} - \frac{S_{m0}}{F - I_{mi}} \right)$$

when day d is the last business day of month m ,

$$HR_{md} = \sum_{i=1}^{d-1} AF_{mi} \times \left(\frac{S_{m0}}{F - I_{mi-1}} - \frac{S_{m0}}{F - I_{mi}} \right) + AF_{md} \times \left(\frac{S_{m0}}{F - I_{md-1}} - \frac{S_{m0}}{S_{md}} \right)$$

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4. Other

(1) Publication

- Currency Hedged Indices are published on the Nikkei's Index website, "Nikkei Indexes".
- Index value is offered once a trading day
- The indices are calculated retroactively to December 30, 2008 in the same way as daily calculation.

(2) License agreement

- Currency Hedged Indices is a copyrighted material calculated in a methodology independently developed and created by the Index Provider and the Index Provider is the sole exclusive owner of the copyright and other intellectual property rights in Currency Hedged Indices itself and the methodology to calculate Currency Hedged Indices. Commercial use of Currency Hedged Indices must be licensed by the Index Provider. Such uses include, but not limited to, provision of derivative products such as futures and options, creation and marketing of linked funds or linked securities, or distribution of the index for the data and analytic services.