

(Reference Translation)

# TSE Index Guidebook (Currency Hedged Index)

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JPX Market Innovation & Research, Inc.

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## Record of Changes

Date	Changes
March 25, 2014	• Modification of the contact details, etc.
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)
Sep 24, 2015	• “TOPIX Total Return GBP Daily Hedged Index” and “TOPIX Total Return US Dollar Daily Hedged Index” added
Apr 12, 2016	• “TOPIX Total Return CHF Daily Hedged Index” added
July 1, 2016	• “TOPIX Total Return SGD Hedged Index” added
Oct 19, 2016	• “Tokyo Stock Exchange REIT Net Total Return US Dollar Hedged Index” added
July 23, 2018	• Addition of a description about disclaimers
March 31, 2020	• Modification of the “Introduction”
August 15, 2022	• “TOPIX Net Total Return Australian Dollar Hedged Index” added • Added revisions with regard to the business transfer to JPXI
May 22, 2023	• “TOPIX Net Total Return HKD Hedged Index” and “TOPIX Net Total Return SGD Hedged Index” added
Oct 15, 2024	• Revised due to the calculation agency change
Jan 31, 2025	• Uniformity of terminology in each calculation methodology

# 1 . Introduction

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- Based on the stock indices calculated by JPX Market Innovation & Research, Inc. (JPXI), JPXI calculates and distributes indices that hedge currency risks (hereinafter "Currency Hedged Indices") in accordance with, as a rule, the methods described in this document. When an event that is not specified in this document occurs, or if JPXI decides it is difficult to use the methods described in this document, JPXI may use an alternative method of index calculation as it deems appropriate.
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- Currency Hedged Indices, which are calculated, distributed and published by QUICK Corp. (QUICK) in accordance with the outsourcing contract, are the exclusive property of JPXI. QUICK uses its best efforts to calculate, distribute and publish Currency Hedged Indices in an accurate and timely manner, but shall accept no liability or responsibility for any loss or damage arising from errors, delays, or termination of the calculation, distribution or publication of Currency Hedged Indices, the use of Currency Hedged Indices or other similar events.
- WM/Refinitiv Closing Spot Rates and WM/Refinitiv Closing Forward Rates are provided by Refinitiv. Refinitiv shall not be liable for any errors or delays in providing or making available the data contained within this service or for any actions taken in reliance on the same.

## 2. Outline

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### (1) Outline

- Currency Hedged Indices are designed to represent returns for global index investment strategies that involve hedging currency risk, but not the underlying constituent risk.
- 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 a certain date are hedged, the index does not assume a perfect hedging of currency movements.

### (2) Target Indices Used For Calculating Currency Hedged Indices

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

Target Indices	Currency
TOPIX Total Return Index	EUR
TOPIX Total Return Index	GBP
TOPIX Total Return Index	USD
TOPIX Total Return Index	SGD
TOPIX Net Total Return Index	EUR
TOPIX Net Total Return Index	GBP
TOPIX Net Total Return Index	USD
TOPIX Net Total Return Index	AUD
TOPIX Net Total Return Index	HKD
TOPIX Net Total Return Index	SGD
Tokyo Stock Exchange REIT Net Total Return Index	USD

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

Target Indices	Currency
TOPIX Total Return Index	EUR
TOPIX Total Return Index	GBP
TOPIX Total Return Index	USD
TOPIX Total Return Index	CHF

### 3. Calculation Method

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- 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 JPY.
  2. The return from the hedge, calculated by a linear interpolation of spot and forward prices.
- According to the procedures noted in the Index Calculation Guidebook, the number of shares for index calculation and base market value shall be the same as for target indices calculated on the same day. The same also applies to the prices for index calculation.
- The index rebalance reference date<sup>1</sup> for Currency Hedged Indices shall be the business day preceding the last business day of the month, and the trading volume for forwards is determined using the index price on the rebalance reference date. Daily Currency Hedged Indices differ from the standard Currency Hedged Indices in that the amount of forward contracts maturing at the end of the month is adjusted on a daily basis according to the performance of the underlying index.
- The base points and base date of indices are as follows.

Index	Base Date	Base Points
TOPIX Total Return EUR Hedged Index	2005/8/31	1463.56
TOPIX Total Return EUR Daily Hedged Index	2005/8/31	1463.56
TOPIX Total Return GBP Hedged Index	2005/8/31	1463.56
TOPIX Total Return GBP Daily Hedged Index	2005/8/31	1463.56
TOPIX Total Return USD Hedged Index	2005/8/31	1463.56
TOPIX Total Return USD Daily Hedged Index	2005/8/31	1463.56
TOPIX Total Return CHF Daily Hedged Index	2005/8/31	1463.56
TOPIX Total Return SGD Hedged Index	2005/8/31	1463.56
TOPIX Net Total Return EUR Hedged Index	2005/8/31	1426.88
TOPIX Net Total Return GBP Hedged Index	2005/8/31	1426.88
TOPIX Net Total Return USD Hedged Index	2005/8/31	1426.88
TOPIX Net Total Return AUD Hedged Index	2005/8/31	1426.88
TOPIX Net Total Return HKD Hedged Index	2005/8/31	1426.88
TOPIX Net Total Return SGD Hedged Index	2005/8/31	1426.88
Tokyo Stock Exchange REIT Net Total Return USD Hedged Index	2003/3/31	1000.00

- JPXI uses the rate for WM/Refinitiv at 4:00 p.m. UK time for Currency Hedged Index calculation.

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<sup>1</sup> For index calculation up to the last business day of February 2015, the index rebalance reference date was the last business day of the month.

- Index calculation method is as follows:

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

$EH$  = the Currency Hedged Index value

$MAF_m$  = 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 TSE index value, in foreign currency

$EL$  = the TSE index value, in JPY

$HR$  = hedge return (%)

$S$  = spot rate in JPY per unit of foreign currency

$F$  = forward rate in JPY per unit of 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 Currency 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

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

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

The hedge return for daily Currency Hedged Indices 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  $m$ ,

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



## 4 . Other

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### **(1) Distribution of Index Values**

- The index values of Currency Hedged Indices are distributed through information vendors, etc.
- Index values are offered once every trading day.

### **(2) Licensing**

- JPXI and/or its affiliates reserve all calculation, distribution, publication, usage and other rights pertaining to Currency Hedged Indices. Because of this, the use of Currency Hedged Indices in the composition and/or sale of financial products such as funds or linked bonds (including its use as the basis for options, swaps, warrants, or other OTC derivatives) requires a license from JPXI. A license from JPXI is also required for the provision and distribution, etc. of Currency Hedged Indices to third parties.

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