

(Reference Translation)

Index Calculation Guidebook

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Tokyo Stock Exchange, Inc.

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Record of change

Date	Changes
2022/4/4	• Launch

Introduction

- Tokyo Stock Exchange, Inc. (TSE) calculates and publishes certain indices (hereinafter referred to as “TOPIX, etc.”) in accordance with the methods described in this document. If an event not specified in this document occurs, or if TSE determines that it is difficult to use the methods described in this document, TSE may use an alternative method of index calculation as it deems appropriate.
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I. Index Calculation

1. Index Value

The index is denominated in points and is calculated to the second decimal place. (Values beyond the second decimal are rounded.)

2. Formula

1) Market capitalization weighting

$$\text{Index} = \frac{\text{Current market value}}{\text{Base market value}} \times \text{Base Point}$$

Current Market Value

$$= \sum (\text{Number of Shares for Each Constituent} \times \text{Stock Price for Each Constituent})$$

Number of Shares Used for Index Calculation for Each Stock

$$= \text{Total Number of Listed Shares} \times \text{Free Float Weight (FFW) Ratio} \\ \times \text{cap- adjustment ratio}$$

- FFW ratios are calculated in accordance with the Free Float Weight Calculation Methodology or each index guidebook.
- Cap-adjustment ratios are calculated in accordance with each index guidebook.
- In general, the “total number of listed shares” in the above formula is equal to the number of listed shares, but in some cases these numbers are different due to corporate actions such as stock splits. For example, in a stock split, the number of listed shares changes on the listing change date, which comes after the effective date. On the other hand, the total number of listed shares used in index calculation (before FFW adjustment) changes on the ex-rights date, leading to a brief period in which the two numbers are different.
- Also, the total number of listed shares used in index calculation (before FFW adjustment) is generally equal to the number of issued shares, but in the case of Nippon Telegraph and Telephone Corporation, Japan Tobacco, Inc., and Japan Post Holdings Co., Ltd., the government of Japan holds some issued shares that have not been listed, leading these two numbers to be different.

2) Stock price average

$$\text{Index} = \frac{\text{Total Constituent Stock Price}}{\text{Divisor}} \times \text{Base Point}$$

* Total Constituent Stock Price

$$= \sum (\text{Adjustment Factor for Each Constituent} \times 10,000 \\ \times \text{Stock Price Used for Calculation})$$

- Adjustment factor for each constituent = Theoretical weight × Fixed value* ÷ Last stock price used for calculation on weighting base date

*The fixed value is 10 to the power of X (10^X). TSE will determine the appropriate integer value for X each time based on the stock price level of the constituents.

- For information on non-periodic reviews of adjustment factors, refer to "4. Review of adjustment factors".
- Theoretical weight is calculated in accordance with each index guidebook.

3) Equal weighting

$$\text{Index} = \frac{\text{Current modified market value}}{\text{Base market value}} \times \text{Base Point}$$

Modified market value =

\sum (Adjustment factor for each constituent \times 10,000 \times Stock price used for calculation)

- Adjustment factor for each constituent = Theoretical weight \times Fixed value* \div Last stock price used for calculation on weighting base date

*The fixed value is 10 to the power of X (10^X). TSE will determine the appropriate integer value for X each time based on the stock price level of the constituents.

- For information on non-periodic reviews of adjustment factors, refer to "4. Reviews of adjustment factors".

4) Non-market capitalization weighting (modified market cap weighting, etc.)

$$\text{Index} = \frac{\text{Current modified market value}}{\text{Base market value}} \times \text{Base Point}$$

Modified market value =

\sum (Adjustment factor for each constituent \times 10,000 \times Stock price used for calculation)

- Adjustment factor for each constituent = Theoretical weight \times Fixed value* \div Last stock price used for calculation on weighting base date

*The fixed value is 10 to the power of X (10^X). TSE will determine the appropriate integer value for X each time based on the stock price level of the constituents.

- For information on non-periodic reviews of adjustment factors, refer to "4. Reviews of adjustment factors".
- Theoretical weight is calculated in accordance with each index guidebook.

3. Stock Price Used for Calculation

- The stock prices used for calculating and adjusting base market values and divisors for TOPIX, etc. are prices from auction trading on TSE and are determined by the following order of priority:

(1) Special quote or sequential trade quote, (2) Contract price, (3) Base price for index calculation when neither (1) or (2) are available (determined in the following order: (1) theoretical ex-rights price, (2) Most recent special quote or sequential trade quote on or before the previous trading day, (3) Most recent contract price before the previous trading day)

4. Reviews of adjustment factors

- Stock split

In the event that a stock split is conducted, the adjustment factor will be changed as follows, with the ex-rights date as the index adjustment date.

New adjustment factor = Adjustment factor × Split ratio

- Capital increase through gratis allotment of subscription warrants

In the event that a capital increase through gratis allotment of subscription warrants is conducted, the adjustment factor will be changed as follows, with the ex-rights date as the index adjustment date.

New adjustment factor = Adjustment factor × (1 + Allotment ratio)

- Capital increase through allotment to shareholders

In the event that a capital increase through allotment to shareholders is conducted, the adjustment factor will be changed as follows, with the ex-rights date as the index adjustment date.

New adjustment factor = Adjustment factor × (1 + Allotment ratio)

- Reverse stock split

In the event that a reverse stock split is conducted, the adjustment factor will be changed as follows, with the ex-rights date as the index adjustment date.

New adjustment factor = Adjustment factor ÷ Reverse split ratio

- Merger

In a merger, if the surviving company and the non-surviving company are both constituents, the adjustment factor of the surviving issue is changed.

II. Adjustments to Base Market Value, etc.

Whenever the market value of the index changes due to an increase or decrease in constituents, capital increase, or similar events other than market fluctuations, the base market values and divisors for the index are adjusted as follows to maintain continuity.

1. Events that Require Adjustment

1) Inclusion or Removal of Constituents

Event Requiring Adjustment	Adjustment Date (*1)	Stock Price Used for Adjustment
Inclusion of constituents	Date of inclusion	Stock price at end of trading on business day before adjustment date (if the constituent is included from its new listing date, the base price)
Removal of constituents	Date of removal	Stock price at end of trading on business day before adjustment date (if the constituent is removed on or after its delisting date, stock price at end of trading on business day before delisting date (*2))

*1 Adjustments to the base market value are made after the end of trading on the business day before the adjustment date (i.e., before the market opens on the adjustment date). The same shall apply hereinafter.

*2 The stock price at the end of trading on the business day before the delisting date is used to calculate the index for the period from the delisting date to the removal date.

2) Changes in Number of Shares Used for Index Calculation

A) Market capitalization weighting

Event Requiring Adjustment	Adjustment Date	Stock Price Used in Adjustment
Changes in free-float weight (FFW)	Date of change	Stock price at end of trading on business day before adjustment date
Public offering	Additional listing date (day after payment date) (*1)	Stock price at end of trading on business day before adjustment date
Third-party allotment	Five business days after additional listing date (which is two business days after payment date)	Stock price at end of trading on business day before adjustment date
Capital increase through allotment	Ex-rights date	Payment price per

Event Requiring Adjustment		Adjustment Date	Stock Price Used in Adjustment
to shareholders			share
Exercise of subscription warrants		Last business day of the month following exercise	Stock price at end of trading on business day before adjustment date
Conversion of preferred stock, etc.		Last business day of the month following conversion	Stock price at end of trading on business day before adjustment date
Cancellation of treasury stock		Last business day of the month following cancellation	Stock price at end of trading on business day before adjustment date
Merger/Stock swap	Situations in which a constituent of TSE-calculated indices (*2) is the non-surviving company (mergers/stock swaps between two issues that are both constituents of an index calculated by TSE)	Delisting date of the non-surviving company	Stock price at end of trading on business day before adjustment date
	Situations other than those described above	Listing change date (effective date)	Stock price at end of trading on business day before adjustment date
Sale of shares held by the Japanese government (Nippon Telegraph, Telephone and Japan Tobacco and Japan Post Holdings only)		Date determined by TSE (*3)	Stock price at end of trading on business day before adjustment date
Rights offering (limited to cases where the allotted subscription warrant securities are listed) (*4)		Ex-rights date	Payment price per share

Event Requiring Adjustment	Adjustment Date	Stock Price Used in Adjustment
Demerger (absorption-type)	Listing change date (effective date)	Stock price at the end of trading on the business day before adjustment date
Other adjustments (*5)	Last business day of the month in which the information appears in “Sho-ho” (TSE Notice) or the last business day of the following month	Stock price at the end of trading on the business day before adjustment date

*: Since market value does not change when there is a stock price revision made due an increase (or decrease) in the number of shares used for index calculation such as a stock split, reverse stock split, or gratis allotment of shares (limited to cases where treasury stock is allotted), etc., no adjustment is made to the base value.

*1: Next business day when the change (addition) date falls on a holiday (the same applies below)

*2: Constituents of TSE-calculated indices include domestic common shares, domestic preferred equity contribution securities, domestic participating classified stocks, foreign stocks with exclusive listing on TSE, REITs, and infrastructure funds.

*3: Generally the delivery date

*4: Capital increase through gratis allotment of subscription warrants (namely, rights offering) corresponds to an increase in shares by the number of shares calculated by multiplying the number of listed shares used for index calculation as of the last day with rights by the number of subscription warrants allotted per share. When the subscription warrants securities allocated are not listed, they are treated as “Exercise of subscription warrants”.

*5: For example, situations in which an issuer of convertible bonds or other securities conducts a stock split; the number of shares calculated based on ratios for stock splits, reverse stock splits, share allotments to shareholders, or right offerings, etc. is different than the final number of shares determined after the effective date; or revisions have been made by listed companies after data has been reflected in index calculation.

B) Stock price average, equal weighting, non-market capitalization weighting

Event Requiring Adjustment	Adjustment Date	Stock Price Used for Adjustment
Capital increase through allotment to shareholders	Ex-rights date	Payment price per share

Event Requiring Adjustment	Adjustment Date	Stock Price Used for Adjustment
Rights offering (limited to cases where the allotted subscription warrants are listed)	Ex-rights date	Payment price per share
Change of adjustment factor	Date of change	Stock price on business day before adjustment date

*Divisors and base market values are not adjusted in cases where stock prices are adjusted because of an increase (or decrease) in the adjustment factor, such as a stock split or reverse stock split, since the modified market value and total constituent stock price remain unchanged.

3) Data Source

- Information on the reasons for adjustments of base market value, etc., details on the adjustments, adjustment dates and other data are available through the “Sho-ho” (TSE Notice) published daily by TSE based on reports, etc. made by listed companies. (Please refer to the appendix for information on calculating FFW.)
- If a listed company revises the contents of a previously published report that resulted in an index adjustment, retroactive index adjustments will NOT be made based on the revised contents.

2. Adjustment Method

1) Indices that do not reflect dividends (i.e. price indices)

A) Adjustment Method

- Base market value will be adjusted according to the formula below in order to maintain the continuity of the index. Market value in the calculation formula should be read as current market value, total constituent stock price, and current modified market value according to the calculation formula. In addition, base market value in the calculation formula should be read as a divisor according to the calculation formula.

$$\frac{\text{Previous Business Day Market Value}}{\text{Pre- Adjustment Base Market Value}} = \frac{(\text{Previous Business Day Market Value} \pm \text{Adjustment Amount})}{\text{New Base Market Value (After Adjustment)}}$$

*Adjustment Amount = Increase (Decrease) in Number of Shares Used for Index Calculation X Stock Price Used for Adjustment

Therefore,

$$\text{New Base Market Value} = \frac{\text{Old Base Market Value} \times (\text{Previous Business Day Market Value} \pm \text{Adjustment Amount})}{\text{Previous Business Day Market Value}}$$

B) Adjustment Example

- If, for example, the old base market value is 20 trillion yen and the previous day's market value is 400 trillion yen, index on the previous day will be:

$$\text{Previous Day index} = \text{¥}400 \text{ tn} \div \text{¥}20 \text{ tn} \times 100 = 2,000.00$$

- Now, suppose that Stock A increases the number of listed shares used for index calculation by 100 million shares due to a public offering. If the closing price of the stock on the previous day was ¥2,000, the adjustment amount is 100 million shares x ¥2,000 = ¥200 billion. The new base market value, therefore, is:

$$\text{New Base Market Value} = \text{¥}20 \text{ tn} \times (\text{¥}400 \text{ tn} + \text{¥}200 \text{ bn}) \div \text{¥}400 \text{ tn} = \text{¥}20.01 \text{ tn}$$

- As illustrated below, if there is no price change in any constituent, the value for index

today is the same as the previous day: 2000 points. Thus, continuity in the index is maintained though adjustments to base market value even if the market value of constituents changes due to public offerings, etc.

$$(\text{¥}400 \text{ tn} + \text{¥}200 \text{ bn}) \div \text{¥}20.01 \text{ tn} = 2,000 \text{ points}$$

2) Total Return Index

- Dividends used in calculating the Total Return Index are gross (i.e. before tax)
- Since the dividend amount for the current period is not fixed as of the ex-dividend date, adjustments made to reflect dividends in the base market value are made in two stages: A) adjustment using estimated dividends and B) minor adjustments made to reflect differences in estimated dividend and dividend amount announced in the earnings report, etc.

A) Adjustments Using Estimated Dividends

- The total dividend amount for all constituents is calculated on ex-dividend dates using estimated dividends, and base market value is adjusted as above. In principle, the estimated dividend amount used is as follows:
 1. Dividend amount for the current period as announced in timely disclosure documents, if available
 2. Dividend amount for the previous period if the dividend for the current period is not fixed (e.g. the dividend is not announced in disclosure documents as (1) above, or the amount is not determined, etc.)
- The base market value adjustment method is basically as described in the previous section, except an adjustment is made to reflect dividends as follows:

$$\text{New Base Market Value} = \frac{\text{Old Base Market Value} \times (\text{Previous Business Day Market Value} - \text{Total Dividends} \pm \text{Adjustment Amount})}{\text{Previous Business Day Market Value}}$$

- * Dividends Per Constituent = Number of Shares Used for Index Calculation on Business Day Before Ex-Dividend Date × Estimated Dividend Per Share
- * Total Dividends = Sum of Dividends for All Constituents
- * Adjustment Amount = Increase (Decrease) in Number of Shares Used for Index

Calculation × Stock Price Used for Adjustment

B) Minor Adjustment Made to Reflect Difference Between Estimated Dividend and Dividend Announced in the Earnings Report, etc.

- Minor adjustments are made with respect to those constituents for which the estimated dividend used on the ex-dividend date and the dividend announced in the earnings report or the notice of dividends of surplus (hereinafter the “earnings report, etc.”) are different. Specifically, the total dividend adjustment amount is calculated and the base market value adjustments are made on the last business day of the month in which the dividend is announced in the earnings report, etc. (hereinafter the “publication date”; if the publication date is one business day before the last business day of the month or the last business day of the month, adjustments will be as a general rule, made on the last business day of the next month).

$\text{New Base Market Value} = \frac{\text{Old Base Market Value} \times (\text{Previous Business Day Market Value} - \text{Total Dividend Adjustment} \pm \text{Adjustment Amount})}{\text{Previous Business Day Market Value}}$
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- * Adjusted Dividend Per Constituent = Number of Shares Used for Index Calculation on Business Day Before Ex-Dividend Date × (Dividend Announced in Earnings Report, etc. - Estimated Dividend Per Share)
- * Total Adjusted Dividends = Sum of Adjusted Dividends for All Constituents
- * Adjustment Amount = Increase (Decrease) in Number of Shares Used for Index Calculation X Stock Price Used for Adjustment

3) Net Total Return Index

- The base market value adjustment to reflect the dividend amount is made at the same time as (2). But when calculating the base market value, the "total dividend amount" and the "total dividend minor adjustment amount" shall each be multiplied by (1 minus the dividend tax rate).
- The tax rate used in calculating is withholding tax rate for listing shares (except for the local tax) at the adjustment date.

III. Contact

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