

TIP Taiwan Semiconductor Total Market Index

I. Introduction

Semiconductor is an important industry in Taiwan's economic development, and plays an important role in the world. In order to measure the overall performance of the stocks listed on Taiwan Stock Exchange(TWSE) and Taipei Exchange(TPEX) in the domestic semiconductor industry and meet the demand of index investment application, Taiwan Index Plus Corporation (TIP) compiles the "TIP Taiwan Semiconductor Total Market Index" (abbr., the "Taiwan Semiconductor Total Market Index") based on "TIP Taiwan Total Market Index" (abbr., "Taiwan Total Market Index") as the parent index, and selects the constituents of the parent index which are listed on TWSE and TPEX classified under the "semiconductor sub-industry" as the constituents. The index, which is calculated using the free float adjusted market capitalization weighting method, serves as the benchmark index that tracks the fluctuation of the Taiwan stock markets on the Semiconductor industry.

II. Calculation and Management

1. The index types of Taiwan Total Market Index include the "Price Index" and the "Total Return Index" which are compiled by TIP and are calculated and disseminated in real time by the TWSE.
2. TIP conducts periodic reviews of constituents according to the index rules.
3. TIP retains the closing market capitalization records of all constituents.
4. Please refer to the ["General Principles for TIP Securities Indices"](#) for the principles of index development, maintenance, and management.

III. Eligibility of Constituents

1. Sampling Universe: Constituents of "Taiwan Total Market Index".
2. Criteria of Constituent Selection: Common stocks on the TWSE or TPEX in the category of "semiconductor".
3. Weighting Method:
 - A. The weight of each individual constituent is determined via its free float adjusted market capitalization.

- B. According to free float adjusted market capitalization, the equity weight of each individual constituent shall not exceed 30%, and the total equity weight of the top five constituents shall not exceed 60%.

IV. Index Calculation

1. Index Calculation Frequency:

- A. Starting April 12, 2021, the real-time Taiwan Semiconductor Total Market Index is calculated and disseminated every five seconds during the trading hours of the TWSE and the TPEX, based on the latest trading prices of the constituent stocks. The end-of-day (EOD) index is calculated once a day after the market closes.
- B. TIP also compiles the Taiwan Market Semiconductor Total Return Index which adjusts the Taiwan Semiconductor Total Market Index after considering the cash dividend factor, in order to reflect the cash dividend-included returns. The index is calculated and published once every day after the market closes.

2. Calculation Formula:

- A. Taiwan Semiconductor Total Market Index as a “Price Index”:

$$Index = \frac{\text{total index market values}}{\text{index divisor}} \times \text{base value}$$

$$Index_{(t)} = \frac{\sum_{i=1}^n c_i \times f_i \times s_{i(t)} \times p_{i(t)}}{Divisor_{(t)}} \times 5000$$

$c_i \times f_i \times s_{i(t)} \times p_{i(t)}$ = “index market value” of constituent i on day t

n = number of index constituents

$p_{i(t)}$ = latest trading price of constituent i on day t

$s_{i(t)}$ = number of outstanding shares of constituent i on day t

f_i = Free Float Coefficient of constituent i

c_i = weight-adjustment coefficient of constituent i

Divisor = index divisor; after the market closes, the index divisor is adjusted according to the Market-Value Investment Index Category under the “[TIP Corporate Actions and Events Methodology](#)” to maintain the index continuity.

The adjustment method is as follows:

Index divisor = index divisor on the previous day

$$\times \left(\frac{\text{total index market values at the previous day's close} \pm \text{total index market values changes}}{\text{total index market values at the previous day's close}} \right)$$

Note 1: The base date is December 31, 2020, and the base value is 5000 points.

Note 2: The index divisor on the base date is the total index market values at that time.

$$\sum_{i=1}^n c_i \times f_i \times s_{i(\text{launch})} \times p_{i(\text{launch})}, \text{ launch} = \text{base date}$$

B. Taiwan Semiconductor Total Market Total Return Index as a “Total Return Index”:

$$\text{Index} = \frac{\text{total index market values}}{\text{index divisor of the total return index}} \times \text{base value}$$

$$\text{Index}_{(t)} = \frac{\sum_{i=1}^n c_i \times f_i \times s_{i(t)} \times p_{i(t)}}{\text{DivisorTR}_{(t)}} \times 5000$$

DivisorTR = index divisor of the “Total Return Index”

When the constituents go ex-dividend, the index divisor adjustment formula is:

index divisor of the total return index =

index divisor of the total return index on the previous day ×

$$\left(\frac{\text{total index market values at the previous day's close} \pm \text{total index market values changes}}{\text{total index market values at the previous day's close}} \right)$$

V. Constituent Adjustment and Index Maintenance

1. Periodic Review and Adjustment of Constituents:

A. The constituents are reviewed four times a year, with the 7th trading day of March, June, September and December as the review dates, and the data cut-off date is the last trading day of February, May, August and November. The number of constituents selected after each periodic review is not fixed.

B. The results of the periodic constituent review will become effective 5 trading days after the review date.

C. For index divisor maintenance, the closing data of the trading day before the effective date of the periodic review is adopted to calculate the difference between the index market values of the new portfolio and the original portfolio (the total market values of the index after the adjustment of the weight-adjustment coefficient and Free Float Coefficient) to use as the total index market value changes.

D. For the periodic review of holding companies or newly established companies,

if the period of the selected data of constituents is insufficient, and if the representative companies of the converted stocks meet the Sampling Universe qualification, the data of the representative companies or their stocks may also be used in the review.

2. Taiwan Semiconductor Total Market Index is a Market-Value Investment Index Category. The related maintenance such as the non-periodic adjustment of constituents, the weight-adjustment coefficient, the number of issued shares, and the index divisor is handled according to the “[TIP Corporate Actions and Events Methodology](#)”.
3. Principles for implementation of the Free Float Coefficient:
 - A. The update for the free float coefficients of all the constituents shall be in conjunction with the effective date of constituents periodic review.
 - B. The Free Float Coefficients of constituents are updated according to the most recent data generated from TIP’s “[TIP Free Float Coefficient Calculation Guide](#)”.