

Index Methodology Guide for the FactSet TSMC Value Chain Index™

Version 1.0 – January 25, 2022

Table of Contents

FactSet TSMC Value Chain Index™	1
Table of Contents	2
Index Introduction and Objective	3
Index Construction	4
Index Maintenance	79
Index Calculation and Data Correction	80
Additional Information.....	91

Index Introduction and Objective

1.1 Index Overview

The FactSet TSMC Value Chain Index is an equity benchmark designed to track the performance of global upstream semiconductor-related companies that are suppliers to Taiwan Semiconductor Manufacturing Co (TSMC). The FactSet TSMC Value Chain Index is a modified market capitalization weighted index reconstituted semiannually in April and October.

The FactSet TSMC Value Chain Index is calculated and maintained by Solactive AG – the Calculation Agent – based on a methodology developed by FactSet. It is calculated on a price, gross and net total return basis in U.S. Dollar (USD). The price, gross, and net total return values of the index are calculated on a real-time and an end-of-day basis, Monday to Friday 1:00 a.m. to 10:50p.m. CET (Central European Time). Index values are distributed via various data channels and market data vendors, including the price marketing services of Boerse Stuttgart AG. Index values of may also be obtained from FactSet upon request.

1.2 Inception Date and Base Value

The Index Inception Date was October 27, 2017, with a base value of 100.00. The inception date refers to when the first back-tested index value was calculated. The back test is based on a similar methodology used to calculate the index when it was officially completed on January 25, 2023.

1.3 Index Valuation Days

Index Valuation Days are business days, Monday to Friday.

1.4 Completion Date

The index completion date was January 25, 2023. Completion date refers to the stated date when the index was officially completed for launch.

1.5 Reconstitution and Rebalance Schedule

The index is reconstituted and rebalanced semiannually after the close of the 4th Friday of April and October each year (“Reconstitution Day”).

If any of the existing or new index components is not trading on Reconstitution Day due to an exchange holiday, the reconstitution/rebalance is moved to the next business day.

The data used to reconstitute and rebalance the index is as of the close of 3rd Friday of April and October (“Selection Day”). Subsequent adjustment to the index composition may be made to account for corporate actions that occur between the Selection Day and the Reconstitution Day or Rebalance Day.

Index Construction

2.1 Constituent Selection and Weighting Schema

1. The securities are primarily listed on one of the following 24 exchanges:

- Australia Stock Exchange
- Borsa Italiana
- Deutsche Borse Xetra
- Euronext Amsterdam
- Euronext Brussels
- Euronext Paris
- Hong Kong Exchange
- Korea Stock Exchange
- London Stock Exchange
- Madrid Stock Exchange
- NASDAQ
- New York Stock Exchange
- NYSE American
- OMX Nordic Copenhagen
- OMX Nordic Helsinki
- OMX Nordic Stockholm
- Oslo Stock Exchange
- Shanghai Stock Exchange*
- Shenzhen Stock Exchange*
- SIX Swiss Exchange
- Taipei Stock Exchange
- Taiwan Stock Exchange
- Tokyo Stock Exchange
- Toronto Stock Exchange

*Must also be eligible in the Hong Kong – China Stock Connect Program for buying and selling.

2. The securities are common stocks, ADR, GDR.

3. The securities have a minimum total market capitalization of \$1 Billion USD, and a minimum three-month ADTV (Average Daily Trading Value) of \$1 Million USD.

4. The security of Taiwan Semiconductor Manufacturing Co. (TSMC) is included, refer to as the target company.

5. First order suppliers as well as their relevancy scores are identified for the target company. This includes both direct suppliers where the source company identifies the relationship and reverse suppliers where the target company identifies the relationship.

In addition, only first order suppliers of the target company that belong to one of the following RBICS Focus Level 3 and Level 6 sectors and industries (Table 1 below) are eligible for index inclusion.

Table 1.

RBICS ID	RBICS L3/L6 NAME
551015	Manufacturing Equipment and Services
551030	Semiconductor Equipment and Services
551020	Semiconductor Manufacturing
451020	Specialty and Performance Chemicals
451020301510	Electronic Materials Manufacturing
551025101010	Electronics Manufacturing Equipment Manufacturing
552015101510	IC-Level Electronic Design Software
552015101515	IC-Level Intellectual Property Software Libraries
401525102015	Industrial/Environmental Construction Contractors
551015151010	Mixed Electronic Systems Manufacturing Services
551010102010	Other Interconnect Components
551530151015	Semiconductors Distributors

6. The securities are first ranked according to their relevancy score. Those with a relevancy score of over 30 are excluded from further consideration. The remaining securities are then ranked by total market capitalization in descending order, with the largest companies at the top of the list. A composite score is calculated for each security, using a weighting of 50% for the relevancy rank and 50% for total market capitalization. The top 19 securities based on this composite score are selected to constitute the 20 index constituents Any existing components are retained if they are ranked less than or equal to 22.

Weight constituents by allocating 28% index weight to the target company (TSMC), and 72% index weight to the 19 constituents based on their individual Float Adjusted Market Capitalization to the total Float Adjusted Market Capitalization (of the 19 constituents). Each of the 19 individual securities are also capped at 8%. In between index reconstitution, if the target company's weight exceed 30% for 3 consecutive business days, it will be automatically be reset back to 28% on the fourth business day.**

**This rule will be implemented on a going forward basis starting on January 25, 2023 and will be not be implemented retroactively.

2.2 Index Return Formulas

The price, gross and net total return levels of the index are calculated using the following formulas.

$$I_{(t)} = \frac{\sum_{i=1}^n S_{i(t)} \times P_{i(t)} \times FX_{i(t)}}{D_{(t)}}$$

where:

$I_{(t)}$ = Index value on Index Valuation Day (t)

$D_{(t)}$ = Divisor on Index Valuation Day (t)

n = Number of stocks in the index

$P_{i(t)}$ = Closing price of stock (i) on Index Valuation Day (t)

$S_{i(t)}$ = Number of allocated shares of stock (i) on Index Valuation Day (t)

$FX_{i(t)}$ = WM Reuters FX rate published at 4:00pm London time on Index Valuation Day (t) required to convert closing price of stock (i) in index currency, USD

and on Inception Date, where (t) = 0, the initial divisor is calculated as follows:

$$D_{(0)} = \frac{\sum_{i=1}^n S_{i(0)} \times P_{i(0)} \times FX_{i(0)}}{I_{(0)}}$$

where:

$I_{(0)}$ = Price Returns Index value on Index Inception Date

$D_{(0)}$ = Divisor on Index Inception Date

n = Number of stocks in the index on Index Inception Date

$P_{i(0)}$ = Price of stock (i) on Index Inception Date

$S_{i(0)}$ = Number of allocated shares of stock (i) on Index Inception Date

$FX_{i(t)}$ = WM Reuters FX rate published at 4:00pm London time on Index Valuation Day (t) required to convert closing price of stock (i) in index currency, USD.

Allocated shares (“S”) are the number of shares required for each constituent such that all constituents are weighted according to the index methodology. Allocated shares (“S”) would be adjusted accordingly to account for Corporate Actions.

Net total return is calculated to account for the effect of tax withholding on dividends by adjusting dividend taken out due to tax payment.

2.3 Index Divisor Adjustments

From time to time, the index divisor is adjusted to account for corporate actions that could distort index value and continuity using the following formula:

$$D_{(t+1)} = D_{(t)} \times \frac{\sum_{i=1}^n AS_{i(t+1)} \times AP_{i(t+1)} \times FX_{i(t)}}{\sum_{i=1}^n S_{i(t)} \times P_{i(t)} \times FX_{i(t)}}$$

where:

- $D_{(t+1)}$ = Divisor for Index Valuation Day (t+1) after CA and rebal adjustment
 $D_{(t)}$ = Divisor for Index Valuation Day (t)
 $AP_{i(t+1)}$ = Adjusted price of stock (i) calculated for open on Index Valuation Day (t+1) after CA adjustment
 $P_{i(t)}$ = Closing price of stock (i) on Index Valuation Day (t)
 $S_{i(t)}$ = Number of allocated shares of stock (i) on Index Valuation Day (t)
 $AS_{i(t+1)}$ = Adjusted number of allocated shares of stock (i) for open on Index Valuation Day (t+1) after CA adjustment.

Divisor adjustments are generally implemented on the date the corporate action becomes effective, such that for example, the ex-dividend date rather than the payment date is used to time the divisor adjustment.

Find below a detailed calculation for AP, AS, and S in case of corporate actions and rebalancing.

$AP_{i(t)}$ = Adjusted price of stock (i) is determined for the open on Index Valuation Day (t) shall mean:

- If index constituent opens ex-date in respect of the corporate action, then $AP_{i(t)}$ is determined as per Corporate Action Adjustment Section.
- Otherwise

$$AP_{i(t)} = P_{i(t-1)}$$

$S_{i(t)}$ = Number of allocated shares of stock (i) on Index Valuation date (t) is determined as

$$S_{i(t)} = AS_{i(t)}$$

$AS_{i(t)}$ = Adjusted number of allocated shares of stock (i) for open on Index Valuation Day (t) after CA adjustment is determined as:

- If such day opens immediately following the Rebalancing Day (t-1) and if:
 - index constituent opens ex-date in respect to corporate action, then $AS_{i(t)}$ is determined as per Corporate Action Adjustment Section with $S_{i(t-1)}$ replace with:

$$S_{i(t-1)} = \frac{I_{(t-1)} \times Weight_{i(t-1)}}{P_{i(t-1)} \times FX_{i(t-1)}}$$

- index constituent does not opens ex-date in respect to corporate action, then $AS_{i(t)}$ is determined as:

$$AS_{i(t)} = \frac{I_{(t-1)} \times Weight_{i(t-1)}}{P_{i(t-1)} \times FX_{i(t-1)}}$$

- On any other day:

- index constituent opens ex-date in respect to corporate action, then $AS_{i(t)}$ is determined as per Corporate Action Adjustment Section
- Otherwise:

$$AS_{i(t)} = S_{i(t-1)}$$

where $Weight_{i(t-1)}$ is determined as per Section 2.1.

2.4 Corporate Action Adjustments

Special Cash Dividend:

$$AP_{i,t} = P_{i,t-1} - D_{i,t} \times FX_{d,t-1}$$

Where

t = Index Valuation Date (t) is ex-date for corporate action.

$D_{i,t}$ = Dividend amount corresponding to stock (i) with ex-date (t).

$FX_{d,t-1}$ = WM Reuters FX rate published at 4:00pm London time fixing on Index Valuation Day (t-1) required to convert dividend amount in underlying stock currency, USD.

Spin-off Adjustment

If an index constituent (i.e. the parent company) distributes part of its business into a spun-off company, the spun-off company will be added to the Index according to the transaction terms on the ex-date.

The parent company will remain in the Index with unchanged calculation parameters. The spun-off company will remain in the Index until the next ordinary rebalancing.

The spun-off company will be added to the Index with an open price of zero on ex-date.

If the spun-off company does not start to trade on the effective date (i.e. ex-date), a theoretical price for the spun-off company will be implemented (**see the equation below**) as a fixed price until it commences trading, from which time official prices will be used.

$$P_{f(t)} = [P_{i(t-1)} - AP_{i(t)}] \times ShareRatio_{i(t)} \times FX_{j,t-1}$$

Where

$P_{i(t-1)}$ = Closing price of Parent Company on Index Valuation Date (t-1).

$AP_{i(t)}$ = Open price of Parent Company on Index Valuation Date (t).

$P_{f(t)}$ = Price of Spun-off Company on Index Valuation Date (t).

$FX_{j,t-1}$ = WM Reuters FX rate published at 4:00pm London time fixing on Index Valuation Day (t-1) required to convert dividend amount in underlying stock currency, USD.

Rights Issue Adjustment

$$AP_{j,t} = \frac{P_{j,t-1} + C_{j,t-1} \times \text{Share Ratio}_{j,t}}{1 + \text{Share Ratio}_{j,t}}$$
$$AS_{j,t} = S_{j,t-1} \times (1 + \text{Share Ratio}_{j,t})$$

Where

$C_{j,t}$ = Official tender price.

Stock Splits Adjustment

$$AP_{j,t} = \frac{P_{j,t-1}}{\text{Share Ratio}_{j,t}}$$
$$AS_{j,t} = S_{j,t-1} \times \text{Share Ratio}_{j,t}$$

Stock distribution

$$AP_{j,t} = P_{j,t-1} \times \frac{1}{1 + \text{Share Ratio}_{j,t}}$$
$$AS_{j,t} = S_{j,t-1} \times (1 + \text{Share Ratio}_{j,t})$$

Index Maintenance

Constituent changes may occur between review periods due to corporate events that disqualify their eligibility for index inclusion. Adjustments to corporate events are described below:

3.1 Corporate Actions – Delisting and Fast Entry

A constituent is removed immediately after being delisted from its primary markets.

3.2 Corporate Actions – Merger/Acquisition and Fast Entry

If a merger or acquisition results in one constituent acquiring another, the acquiring company remains a constituent, and the acquired company is removed. If a non-constituent acquires a constituent, the acquired constituent is removed. If a constituent acquires a non-constituent, the acquiring constituent remains a constituent.

3.3 Corporate Actions – Spin-off

If a constituent spins or splits off a portion of its business, both the spun-off companies and the parent companies (with the highest market value relative to the spun-off companies) will be kept in the index,

and be considered for removal from the index at the next Reconstitution or Rebalance Day should they fail to meet the eligibility criteria in Section 2.1.

3.4 Corporate Actions – Bankruptcy

If a constituent is delisted after bankruptcy, it will be removed immediately with a price of 0 from the index.

Index Calculation and Data Correction

4.1 Index Calculation

Price, gross, and net total return values are calculated by Solactive AG. The price, gross, and net total return values are calculated on a continuous and end-of-day basis by using the trading price for each component in the index from relevant exchanges and markets. Index values are rounded to 2 decimal places and divisors are rounded to 6 decimal places.

If trading in a stock is suspended prior to the market opening, the stock's adjusted closing price from the previous day will be used in the index calculation until trading commences. If trading in a stock is suspended while the relevant market is open, the official closing price published by relevant exchange for that stock will be used for all subsequent index calculations until trading resumes.

In case of exceptional market conditions disrupting normal closing auction, or causing official closing prices not being available, Solactive and FactSet reserve the right to utilize other prices in the calculation of the official closing level.

4.2 Data Correction

Incorrect index constituent data, corporate action data, or index divisors will be corrected upon detection. If such errors are discovered within five days of occurrence, they will be corrected retroactively on the day of discovery. If discovered after five days, corrective actions will be decided based on the errors' significance and feasibility of a correction.

4.3 Decision Making in Undocumented Events

A FactSet Index Committee consisting of select employees of FactSet Research Systems Inc. is responsible for amending rules as documented in the Index Methodology Guide due to undocumented or extraordinary events.

Additional Information

5.1 Contact Information

FactSet Research Systems Inc.
One Sansome St. Floor 19
San Francisco, CA 94104
Tel.: 1.415.645.0967
Fax: 1.415.645.0901
Contact: GoIndexing@factset.com

Version	Release Date	Notes
Version 1.0	January 25, 2023	