

# **Index Methodology Guide for the FactSet Automotive Index™**

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## Index Introduction and Objective

### 1.1 Index Overview

The FactSet Automotive Index is designed to provide an equity benchmark for investors to track the performance of companies engaged in the manufacturing and distribution of automotive vehicles, parts, and components.

The FactSet Automotive Index is a float-adjusted, modified market capitalization weighted index rebalanced on a quarterly basis.

The FactSet Automotive Index is calculated and maintained by the New York Stock Exchange Group (NYSE) based on a methodology developed by FactSet. It is calculated on a price and total return basis in U.S. dollars (USD). Both price and total returns of the index are calculated on an end-of-day basis, from Monday to Friday, at 4:30 p.m. EST. Index values are distributed via various data channels and market data vendors, including the NYSE Global Index Feed (NYSE GIF). End-of-day price and total return values of the index may also be obtained from FactSet upon request.

Whenever possible, constituent changes to the index are announced at least two trading days before becoming effective.

### 1.2 Inception Date and Base Value

The Index Inception Date was February 28, 2007 with a base value of 467.83. 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 launched on February 10, 2017.

### 1.3 Index Valuation Days

Index Valuation Days are business days, Monday to Friday, where constituents of the index are scheduled to be open for their regular trading session. The index will not be published on a day for which none of the constituents has a scheduled trading session.

### 1.4 Commencement Date

The index commencement date was February 10, 2017. Commencement date refers to when the index was officially launched with real-time, end-of-day calculations.

### 1.5 Reconstitution and Rebalance Schedule

The index is reconstituted annually after the close of the last business day in February each year ("Reconstitution Day"). Index constituent weights are rebalanced quarterly after the close of the last business day in February, May, August, and November each year ("Rebalance Day"). Initial public offerings (IPOs) will also be considered for index inclusion on Rebalance Day. If the Reconstitution Day or Rebalance Day is a holiday, it will occur on the next business day.

The data used to reconstitute and rebalance the index is as of the close of business on the second Friday in February, May, August, and November (“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

The following rules are used for the initial constituent selection and ongoing reconstitution and rebalance.

1. The securities are listed on one of the following three exchanges: New York Stock Exchange, NASDAQ, and Toronto Stock Exchange.
2. The securities are common stocks or ADR.
3. The securities have a minimum float-adjusted market capitalization of U.S. \$100 million or greater, and three-month Average Daily Trading Value (ADTV) of U.S. \$1 million or greater, on Selection Day. For ADRs, they must have a float-adjusted market capitalization of U.S. \$1 billion or greater and primarily listed in a developed market exchange.

Existing constituents may remain in the index if they have a minimum float-adjusted market capitalization of U.S. \$75 million or greater, and a three-month ADTV of U.S. \$0.75 million or greater on Selection Day. Existing constituents that are ADRs could remain in the index if they have a minimum float-adjusted market capitalization of U.S. \$750 million or greater, and a three-month ADTV of U.S. \$0.75 million or greater on Selection Day.

4. Securities that are Master Limited Partnership (MLP), royalty trust, or Business Development Company (BDC) are excluded.
5. IPO securities newer than three months relative to Rebalance Day are excluded.
6. The securities are classified as focused to one of the **18** Level 6 automotive-related industries as defined by FactSet Revere Business Industry Classification System (RBICS ):

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Auto Exterior Comfort/Safety/Electronics Products</li> <li>• Auto Interior Comfort/Safety/Electronics Products</li> <li>• Automotive Parts and Accessories Stores</li> <li>• Car Manufacturers</li> <li>• Chassis and Body Manufacturing</li> <li>• General Automobile Dealers</li> </ul> | <ul style="list-style-type: none"> <li>• Motor Vehicle Supplies and Parts Distributors</li> <li>• Motor Vehicles and Parts Retail</li> <li>• Motorcycle Manufacturing</li> <li>• Multi-Type Motor Vehicle Parts Manufacturers</li> <li>• New Car Dealers</li> <li>• New Tire Manufacturing</li> </ul> |
|--|---|

- Other Auto Comfort, Safety and Electronic Products
  - Pan-Powertrain and Chassis Manufacturing
  - Powertrain and Chassis Thermal Management Products
  - Powertrain Manufacturing
  - Used Car Dealers
  - Vehicle Wheel Manufacturing
7. If a company has multiple share classes, only include the most liquid issue based on the highest three-month ADTV on Selection Day.
  8. Apply the float-adjusted modified market capitalization weighting methodology to securities that remain after steps one to seven by dividing their individual float-adjusted market capitalization to the sum total market capitalization of all securities.

Individual security weights are capped at 10% and no more than four securities are at that cap. Excess weight of any capped security is redistributed proportionally among remaining securities whose weights are less than 10%. If this redistribution leads to additional security weights exceeding 10%, the aforementioned redistribution process is repeated iteratively until no security weight exceeds 10%.

Next, the cumulative weight of all securities with an individual weight of 5% or greater shall not in aggregate exceed 45% of the weight of the index, otherwise, they will be capped until and in descending order, at either 4.5% or at a percentage that would bring the aggregate weights to be equal to or greater than 45%, whichever is larger. Excess weight of any capped security is redistributed proportionally among remaining securities.

Any remaining non-capped securities with weights equal to or greater than 4.5% are capped at 4.5%. Excess weight is redistributed proportionally among remaining securities whose weights are less than 4.5%. The aforementioned redistribution process is repeated iteratively until all securities with 5% or greater weight do not in aggregate exceed 45% of the weight of the index.

## 2.2 Index Return Formulas

The price and total returns of the index are calculated using the following formulas.

Price Returns Formula:

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

where:

$I_{(t)}$  = Price Returns 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)

$FX_{i(t)}$  = Spot FX rate published at 4:30 p.m. EST 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

$FX_{i(t)}$  = Spot FX rate published at 4:30 p.m. EST on Index Inception Date 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 relative to their float-adjusted market capitalization. Allocated shares (“S”) will be adjusted to account for corporate actions.

Total Returns Formula:

$$TI_{(t)} = TI_{(t-1)} \times (1 + IR_{(t)})$$

where:

$TI_{(t)}$  = Total Returns Index value on Index Valuation Day (t)

$TI_{(t-1)}$  = Total Returns Index value on Index Valuation Day (t-1)

$IR_{(t)}$  = Index Daily Total Return on Index Valuation Day (t)

$IR_{(t)}$  is calculated by incorporating the dividend (income) effect into the index’s price returns as follows:

$$IR_{(t)} = \frac{I_{(t)} + \left( \frac{\sum_{i=1}^n V_{i(t)} \times S_{i(t)}}{D_{(t)}} \right)}{I_{(t-1)}} - 1$$

where:

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

$I_{(t-1)}$  = Price Returns Index value on Index Valuation Day (t-1)

$D_{(t)}$  = Price Returns Index divisor on Index Valuation Day (t)

$V_{i(t)}$  = Dividends paid by stock (i) on Index Valuation Day (t) , adjusted for FX conversion into index currency

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

### 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<sub>i,t</sub>** = Dividend amount corresponding to stock (i) with ex-date (t).

**FX<sub>d,t-1</sub>** = Spot FX rate published at 4:30 p.m. EST fixing on Index Valuation Day (t) required to convert dividend amount in underlying stock currency, USD.

### Spin-off Adjustment

$$AP_{i,t,s} = P_{i,t-1} - P_{f,t-1} \times ShareRatio_{f,t} \times FX_{j,t-1}$$

Where

**P<sub>f,t-1</sub>** = Closing price of Spinoff stock on Index Valuation Date (t-1).

**FX<sub>j,t-1</sub>** = Spot FX rate published at 4:30 p.m. EST on Index Valuation Day (t) required to convert price of spunoff company to constituent stock currency, USD.

### Rights Issue Adjustment



$$AP_{j,t} = \frac{P_{j,t-1} + C_{j,t} \times \text{ShareRatio}_{j,t}}{1 + \text{ShareRatio}_{j,t}}$$

$$AS_{j,t} = S_{j,t-1} \times (1 + \text{ShareRatio}_{j,t})$$

Where

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

### Stock Splits Adjustment

$$AP_{j,t} = \frac{P_{j,t-1}}{\text{ShareRatio}_{j,t}}$$

$$AS_{j,t} = S_{j,t-1} \times \text{ShareRatio}_{j,t}$$

### Stock distribution

$$AP_{j,t} = P_{j,t-1} \times \frac{1}{1 + \text{ShareRatio}_{j,t}}$$

$$AN_{j,t} = N_{j,t-1} \times (1 + \text{ShareRatio}_{j,t})$$

## 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

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

### 3.2 Corporate Actions – Merger or Acquisition

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

A constituent will generally be removed immediately after bankruptcy filing. Exceptions could be made to keep the constituent when the bankruptcy involves reorganization, and not an asset liquidation or cease of operation. Index divisor will be adjusted accordingly to prevent distortion that could affect the share capital of the index constituents.

**Adjustment for stock removal from constituents:**

$$AN_{j,t} = 0$$

## Index Calculation and Data Correction

### 4.1 Index Calculation

Price and total return values for the FactSet Automotive Index are calculated by NYSE. The price and total return values are calculated on a real-time, end-of-day basis by using the last traded price for each component in the index from relevant exchanges and markets. Index values are rounded to 15 decimal places and divisors are rounded to 15 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 NYSE 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, NYSE 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

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### 5.2 Version History

<b>Version</b>	<b>Release Date</b>	<b>Notes</b>
Version 1.0	February 10, 2017	First release.