19 Nov. 2018

Detailed note on older (erroneous) and revised (validated) method of Nifty PE & Nifty EPS computation

This note explains why my past Nifty PE and EPS computation was wrong and the revised way of computing it correctly. It is divided into 4 parts:

1. The old method
2. The revised method
3. Why the error
4. Validation of the revised method

Part 1: The old Method

The old method was as follows:

$$Nifty = K * [\sum(MCap1 * W1)]$$

Where

MCap1, 2, 3……50 are the market caps of constituents

W1, 2, 3….50 are the weights that **represent proportion, assigned manually and reported as "Weightage" every month**, for the each constituent by the Index Committee, and

K is a constant that gets adjusted for changes in weights W(1…50) and constituents MCap(1…50)

Thus the **Nifty PE** ratio would be

$$\frac{\Sigma(MCap1 * W1)}{\Sigma(PAT1 * W1)}$$

Where,

PAT1, 2, 3…50 are the Trailing Twelve Months Consolidated (or Standalone if Consolidated is unavailable) Profit After Tax attributable to the shareholders of the company.

The denominator was the proportionate earnings of every stock in the constituent weighted accordingly by W1, 2…50

And this is how we have been computing **Nifty PE ratio**.

Nifty EPS is then computed as *Nifty / Nifty PE Ratio*

Part 2: The revised method

The new and proper method appears as follows:

$$Nifty = K * [\sum(FFMCap1)]$$

Where,

FFMCap1,2,3…50 are the Free Float Market Cap (defined below) of the constituents, as computed and shared at Niftyindices.com.

$$FFMCap1 = MCap1 * W1, FFMCap2 = MCap2 * W2, …. and FFMCap50 = MCap50 * W50$$

Where *MCap1, 2, 3……50* are the market capitalisation of the constituents

W1, 2, 3….50 are weights (called *Investible Weight Factor* by Nifty) that represent that proportion of the Market Cap of every constituent that is the Free Float MarketCap.

Free Float Market Cap is arrived at after reducing Market Cap for shares that are generally not available for trade. Thus, Market Cap attributable to promoter stake, Govt stake, strategic stakes by Indian corporates, stakes by FDI holding etc**.** are removed from Market Cap to arrive at Free Float Market Cap.

K is a constant (called Index Divisor) that keeps the value of Nifty constant from changes (like proportion of free float Mcap, corporate actions, replacement of constituents) that don't matter for Nifty.

Thus,

The weights would be calculated as

$$W1 = \frac{FFMCap1}{MCap1}$$

For every W1, W2,…W50

And, the **Nifty PE ratio** would be

$$\frac{\Sigma(FFMCap1)}{\Sigma(PAT1 * W1)}$$

Where

PAT1, 2, 3…50 are the Trailing Twelve Months Consolidated (or Standalone if Consolidated is unavailable) Profit After Tax attributable to the shareholders of the company. This is adjusted by W1, W2…W50 to reflect the extent of Free Float PAT

Nifty EPS is then computed as *Nifty / PE Ratio*

Part 3: Why the error

Earlier I took the weights from the "Weightage" column shown against every constituent in the Nifty sheet released every month. This is wrong. For example, the latest weightage in the latest Nifty constituent release from here (for Oct 2018 when posted) http://www.niftyindices.com/reports/monthly-reports (download - "Market Capitalisation, Weightage, Beta (Zip)" and open the .CSV file named "nifty50_mcwb")), gave me the impression that these are weights are attached to every stock. They are not. These "Weightages", when verified, are the proportion of Free Float MCap of a constituent to the Total Free Float MCap. For instance in the above CSV file for Oct 2018, the weightage for Adani Ports and Special Economic Zone Ltd. (cell G4) is equal to cell F4 divided by sum of cells F4 to F53 (also given in F54) expressed in %age up to two decimal places. They are NOT, as wrongly assumed by me, weights manually assigned for each stock.

Simply put, Nifty Market Cap is thus, the sum of Free Float Market Cap of all its constituents, and Nifty, when derived from this Market Cap is adjusted by the **index divisor** to ensure they remain the same for changes in index constituents, free float of stocks, corporate actions and so forth.

If so, then Nifty Earnings will be the sum of earnings of every constituent to the same extent that the Free Float Market Cap bears to the Total Market cap of that constituent. Thus, say Adani Ports & Special Economic Zone Ltd. Free Float Market Cap is ₹ 250922.7 million and the Total Market Cap is ₹ 660322.97 million on Oct 31, 2018. Thus its earnings that will be counted in the Nifty will be PAT of ₹ 32170.8 million * 250922.7 / 660322.97. Similarly for others.

Nifty PE will thus be Nifty Market Cap divided by Nifty Earnings, and **Nifty EPS** will be Nifty divided by **Nifty PE.**

Part 4: Validation of the revised method

If this method is correct then the ratio of Nifty Free Float MCap between 2 quarters should be the same as Nifty, unless there are changes to Nifty, which would change the Free Float MCap. I have computed such ratios for Nov 2017 & Feb 2018, and, May 2018 & August 2018 quarters, where the Nifty constituents were unchanged, when Q2 FY 18 & Q3 FY 18 and Q4 FY 18 & Q1 FY19 results were declared. The difference in the ratios are between 0.25% & 0.32%, which is acceptable in my opinion.