



Knowledge Series:  
**Understanding the Stock Market Index**

April 2009

**Opportunity favours  
the prepared mind.**

**DSP BLACKROCK**  
INVESTMENT MANAGERS



## What Is A Stock Market Index?

- Stock market indices basically convey the mood of the market and act as the market's messengers
- Indices represent different clusters of stocks/ industries and the rise and fall in these indices' values is a close representation of the market's view on the stocks that make these indices. Hence, stock market news is cumulatively reflected in the movement of the index
- Simply put, an index represents the composite value of shares of different companies traded on a particular stock exchange
- Till late 1980s, there was no index for India's stock markets, till the Bombay Stock Exchange (BSE) introduced the 'Sensex' in 1986 (which represents composite share value of 30 selected companies trading on BSE).
- Later in the 1990s, the National Stock Exchange (NSE) introduced another index, popularly known as the Nifty (which represents composite share value of 50 selected companies trading on NSE)

Stock market indices provide us with a common measurement tool for the rise and fall in prices of shares that are traded on the index

## First List Of Companies In BSE Sensex as on 1<sup>st</sup> January 1978

Companies in the BSE Sensex	
Asian Cables	Indian Organic
Ballarpur Industries Limited	Indian Rayon
Bombay Burmah	ITC
Ceat Limited	Kirloskar Cummins
Century Textiles	L&T
Crompton Greaves	Mahindra & Mahindra
Glaxo Smithkline Pharma	Mukand Iron
Grasim	Nestle
GSFC	RIL
Hindalco	Scindia Shipping[4]
Hindustan Motors	Siemens
HLL	Tata Motors
Indian Hotels Company	Tata Power
Indian Organic	Tata Steel
Indian Rayon	Zenith

## Latest List\* Of Companies In BSE Sensex today

Company	Sector
ACC*	Housing Related
BHEL	Capital Goods
Bharti Airtel	Telecom
DLF Universal Limited	Housing related
Grasim Industries*	Diversified
HDFC	Finance
HDFC Bank	Finance
Hindalco Industries*	Metal, Metal Products & Mining
Hindustan Lever Limited*	FMCG
ICICI Bank	Finance
Infosys	Information Technology
ITC Limited*	FMCG
Jaiprakash Associates	Housing Related
Larsen & Toubro	Capital Goods
Mahindra & Mahindra Limited	Transport Equipments

Company	Sector
Maruti Suzuki	Transport Equipments
NTPC	Power
ONGC	Oil & Gas
Ranbaxy Laboratories	Healthcare
Reliance Communications	Telecom
Reliance Industries*	Oil & Gas
Reliance Infrastructure	Power
State Bank of India	Finance
Sterlite Industries	Metal, Metal Products, and Mining
Sun Pharmaceutical Industries	Healthcare
Tata Consultancy Services	Information Technology
Tata Motors*	Transport Equipments
Tata Power	Power
Tata Steel*	Metal, Metal Products & Mining
Wipro	Information Technology

\*ACC, Grasim, Hindalco, HLL, ITC, RIL, Tata Motors and Tata Steel are the only eight companies that have been a part of the Sensex since its inception

## How Is An Index Constructed?

- Three basic ingredients have to be judged:
  1. Base year for measurement
  2. Number of companies to be included
  3. Base value (For eg: 10/100/1000)
- For BSE Sensex:
  - Base year: 1978-79
  - Number of companies: 30
  - Base value: 100
  - Date of launch: January 1, 1986 (baselined to 1978-79)
  - Index calculated every 15 seconds

No written rule which specifies number of companies to be included or base value to be considered (Sensex considered 100 as it was neither too large nor too small a value)

## On What Basis Are Companies Chosen To Be Part Of An Index?

- Composition of the companies in an index can keep changing periodically
- Some factors on which the decision to include a company depends on:
  - *Size of free float market capitalization*
  - *Frequency of trading*
  - *Listed history and track record*
  - *Industry representation*
- When the BSE Sensex was originally formed, it used the weight of market capitalization of companies, but from September 2003 onwards, it shifted to the free-float market capitalization method.

## Selection Criteria For BSE Sensex

- **Listed History:** The scrip should have a listing history of at least 3 months at BSE. Exception may be considered if full market capitalization of a newly listed company ranks among top 10 in the list of BSE universe. In case, a company is listed on account of merger/ demerger/ amalgamation, minimum listing history would not be required.
- **Trading Frequency:** The scrip should have been traded on each and every trading day in the last three months at BSE. Exceptions can be made for extreme reasons like scrip suspension etc.
- **Final Rank:** The scrip should figure in the top 100 companies listed by final rank. The final rank is arrived at by assigning 75% weightage to the rank on the basis of three-month average full market capitalization and 25% weightage to the liquidity rank based on three-month average daily turnover & three-month average impact cost.
- **Market Capitalization Weightage:** The weightage of each scrip in SENSEX based on three-month average free-float market capitalization should be at least 0.5% of the Index.
- **Industry/Sector Representation:** Scrip selection would generally take into account a balanced representation of the listed companies in the universe of BSE.
- **Track Record:** In the opinion of the BSE Index Committee, the company should have an acceptable track record.

# What Is Free-Float Market Capitalization?

- Free-float is defined as the total number of shares which are actually available for day-to-day trading (hence this excludes shares locked with promoters, institutional investors, government etc)
- **Multiplying the number of free-float shares of a company with the current market price gives us the value of free-float market capitalization (FFMC)**
- How is this used?
  - Suppose in base year, FFMC of A: Rs 100, for B: Rs 200 and so on, adding up to overall FFMC for all 30 companies in the index: Rs 1000
  - Base Value of the index: Rs 100
  - **Establish a proportional relationship between base value and FFMC (termed as index divisor) by equating the overall FFMC (Rs 1000) to value of the base (100 points)**
  - Hence, each Rs 10 of FFMC is worth 1 point in terms of base value of the index
  - **In other words, if market cap rises by Rs 100, index should rise by 10 points**

Free-float market capitalization defines how much money will be required if one were to buy all the shares of a company that are available for trading

## What Is The 'Index Divisor'?

- It is the proportional link between the base value of the index and the free float market capitalization
- Dividing the FFMC (Rs 1000) with the index divisor (10 from the previous example), gives one the base value
- If the FFMC increases next day by 30% (hence the value increasing to Rs 1300), then dividing this value by the index divisor will give the index value at that point in time
- Hence, **the index divisor acts as a link between the past and the present value of the index**
- It also helps in ensuring that corporate actions such as stock splits, bonus and rights issues, mergers etc don't distort the value of the index

To calculate value of index at any point in time, one needs to divide the free-float market cap of all shares with the index divisor

## Other Benefits Of The 'Index Divisor'

- Apart from helping to derive the value of the index, the index divisor also plays a great role in 'maintenance of index' (in technical terms)
- This means making necessary modifications in the value of index divisor to counterbalance the effects of corporate actions such as those mentioned in the previous slide
- Supposing that the number of free float shares of a company suddenly increases due to some reason, for eg because of a bonus issue
  - Even though the market price of the stock doesn't move at all, the free-float market cap shows an increase, hence increasing the value of index as well (which would be a misrepresentation)
  - In such a scenario, necessary adjustments are made in the index divisor so that the continuity of the index is not affected

The index divisor plays an important role in not only determining the value of the index, but also to 'maintain the index'. Hence choosing the right index divisor is always important

# Advantages Of Free-float Methodology

- **Reflects the market trends more rationally:** takes into consideration only those shares that are available for trading in the market
- **Makes the index more broad-based** by reducing concentration of top few companies in Index
- **Aids both active and passive investing styles**
  - Aids active managers by enabling them to benchmark fund returns vis-à-vis an investible index, enabling an apple-to-apple comparison thereby facilitating better evaluation of performance of active managers
  - Being a perfectly replicable portfolio of stocks, a Free-float adjusted index is best suited for the passive managers as it enables them to track the index with the least tracking error
- **Improves index flexibility** in terms of including any stock from the universe of listed stocks, improving market coverage and sector coverage of the index.
  - For eg, under a Full-market cap methodology, companies with large market cap and low free-float can't generally be included in the Index because they tend to distort the index by having an undue influence on the index movement
  - However, under the Free-float Methodology, since only the free-float market cap of each company is considered for index calculation, it becomes possible to include such closely-held companies in the index while at the same time preventing their undue influence on the index movement

## Advantages Of Free-float Methodology (cont'd)

- Globally, the Free-float Methodology of index construction is considered to be an industry best practice and all major index providers like MSCI, FTSE, S&P and STOXX have adopted the same
  - MSCI, a leading global index provider, shifted all its indices to the this methodology in 2002
  - The MSCI India Standard Index, which is followed by Foreign Institutional Investors (FIIs) to track Indian equities, is also based on the Free-float Methodology
  - NASDAQ-100, the underlying index to the famous Exchange Traded Fund (ETF) - QQQ is based on the Free-float Methodology

## Adjustments For Corporate Actions (Bonus, Rights & Newly Issued Capital)

- Index calculation needs to be adjusted for issue of Bonus or Rights shares, if no adjustments were made, discontinuity would arise between current value of index and previous value despite the non-occurrence of any economic activity
- At the BSE Index Cell, the base value is adjusted, which is used to alter market capitalization of the component stocks to arrive at the SENSEX value. The Cell keeps a close watch on the events that might affect the index on a regular basis and carries out daily maintenance of all the 19 Indices
- **Adjustments for Rights Issues**
  - When a company issues right shares, free-float market cap is increased by the number of additional shares issued based on the theoretical price. An offsetting or proportionate adjustment is then made to the Base Market cap
- **Adjustments for Bonus Issue**
  - When a company issues bonus shares, the market cap does not undergo any change, so there is no change in the Base Market cap, only the 'number of shares' in the formula is updated
- **Other Issues**
  - Base Market cap adjustment is required when new shares are issued by way of conversion of debentures, mergers, spin-offs etc. or when equity is reduced by way of buy-back of shares, corporate restructuring etc

## Adjustments For Corporate Actions (Bonus, Rights & Newly Issued Capital)

### - Base Market capitalization Adjustment

The formula for adjusting the Base Market capitalization is as follows:

$$\text{New Base Market capitalization} = \text{Old Base Market Capitalization} \times \frac{\text{New Market Capitalization}}{\text{Old Market Capitalization}}$$

To illustrate, suppose a company issues right shares which increases the market capitalization of the shares of that company by say, Rs.100 crores. The existing Base Market capitalization (Old Base Market capitalization), say, is Rs.2450 crores and the aggregate market capitalization of all the shares included in the index before the right issue is made is, say Rs.4781 crore. The "New Base Market capitalization " will then be:

$$\text{New Base Market capitalization} = \frac{2450 \times (4781+100)}{4781} = \text{Rs } 2501.24 \text{ cr}$$

This figure of Rs. 2501.24 crore will be used as the Base Market capitalization for calculating the index number from then onwards till the next base change becomes necessary



Thank You