Basic Equity Indexes

- **What is an Index?**
  - It consolidates the performance of an entire market into a single number
  - It can also represent a segment of the market, a geographic region or an asset class.

- **Need to create an index -** By creating one, you are able to use the index (sample) to represent the market (population).

- **Uses of an index:**
  - Reflection of market sentiments.
  - Helps in benchmarking performance.
  - Useful for constructing index funds and exchange traded funds

Price Weighted Index

- Early indexes were price weighted- the weight is determined by dividing the price of each security with the sum of the prices of all the constituent securities.
- This index will emulate a portfolio created by purchasing one unit of each constituent security.

$$\text{Value of the price weighted index} = \frac{\text{Total of prices of all securities}}{\text{No. of securities}}$$

Return of the index = (Closing Value – Opening Value) / Opening Value

- Securities with greater price comprise a larger part of the index.
- The divisor of the formulae need to be adjusted after a stock-split / stock consolidation or stock dividend so that the index value does not change.
- E.g. Dow Jones Industrial Average (DJIA) and Nikkei.

Adjustment for the divisor

Company	Price	No of Shares	Value
A	10	10,000	100,000
B	100	4,000	400,000

- Index value would be (10 + 100) / 2 = 55.
- Now suppose the next day, prices of the securities don't change, but stock B splits 2:1 to 50.
- Without adjustment the value of the index = (10 + 50) / 2 = 30 which will reflect as if the prices of the securities have fallen and therefore overall population (market) has underperformed. But nothing has changed in reality.
- So we need to readjust the divisor so that the final index value stays at 55.
- Index value post the split = (10 + 50) / x = 55; Solving for x = 1.091.
- Henceforth, whenever the value of the index will be calculated, one has to use 1.091 instead of 2 as divisor.
- As stocks split, divisor keeps getting smaller, so the DJIA is at 12000 when many stocks in it are priced under $100.

Value Weighted Index

- An index where weight of each constituent is proportional to its market value.

$$\text{Weight of Security A} = \frac{\text{Prices of A x Units of A in Index}}{\text{Total Market Value of all the securities in index}}$$

- Value of the market Value weighted index = (10*100,000 +100*400,000)/500,000 = 82.
- Return of the index = (Closing Value – Opening Value) / Opening Value.
- Securities with greater market value have greater weight.
- The divisor of the formulae need not be readjusted after a stock-split / stock consolidation or stock. dividend since the market value does not change after such an event.
- Other type of Indexes- Total Return Index (includes dividends), International Index (MSCI with country cap weights) also exist.

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