

# Outline

- 1 Objective
- 2 Brief about KSE-100 Index
- 3 Stock Selection Rules
- 4 Calculation Methodology
5. Recombination of the KSE-100 Index
  - 5.1 Sector Rules
    - 5.1.1 Time-Based Rule
    - 5.1.2 Value-Based Rule
  - 5.2 Capitalization Rules
    - 5.2.1 Time-Based Rule
  - 5.3 Rules for New Issues
- 5 Replacement of Stock in the Index
- 6 Adjustment of Stock in the Index

*Dividend Bonus Dividend & Bonus Right Issue*

## FREE FLOAT BASED KSE-100 INDEX

### 1. OBJECTIVE

The primary objective of the KSE100 index is to have a benchmark by which the stock price performance can be compared to over a period of time. In particular, the KSE 100 is designed to provide investors with a sense of how the Pakistan equity market is performing. Thus, the KSE100 is similar to other indicators that track various sectors of the Pakistan economic activity such as the gross national product, consumer price index, etc.

### 2. BRIEF ABOUT KSE-100 INDEX

The KSE-100 Index was introduced in November 1991 with base value of 1,000 points. The Index comprises of 100 companies selected on the basis of sector representation and highest Free-Float Capitalisation, which captures around 80% of the total Free-Float Capitalisation of the companies listed on the Exchange. Out of the following 36 Sectors, 35 companies are selected i.e. one company from each sector (excluding Open-End Mutual Fund Sector) on the basis of the largest Free-Float Capitalisation and the remaining 65 companies are selected on the basis of largest Free-Float Capitalisation in descending order. This is a total return index i.e. dividend, bonus and rights are adjusted. Index Expert Committee (IEC) of PSX recommended to the governing board of directors of the Pakistan Stock Exchange Limited (PSX) in early 2012 to implement the KSE100 Index on the basis of free-float market capitalization. In the meeting held on April 24th, 2012, the

governing PSX Board ratified the IEG recommendation. The Free-float based KSE-100 was calculated parallel to the full-cap KSE-100 Index since 11<sup>th</sup> June 2012 and the recomposed KSE-100 Index based on free-float methodology effective from October 15<sup>th</sup> 2012. In this transition, the Rules for composition and re-composition of the Index based on free-float methodology have remained un-changed other than selection of companies on the basis of free-float market capitalisation as against total market capitalisation.

### **Free Float Methodology**

Free-Float means proportion of total shares issued by a company that are readily available for trading at the Stock Exchange. It generally excludes the shares held by controlling directors / sponsors / promoters, government and other locked-in shares not available for trading in the normal course.

### **Objective and Description:**

- Free-Float calculation can be used to construct stock indices for better market representation than those constructed on the basis of total Free Float market capitalization of companies.
- It gives weight for constituent companies as per their actual liquidity in the market and is not unduly influenced by tightly held large-cap companies.
- Free-Float can be used by the Exchange for regulatory purposes such as risk management and market surveillance.

### **Free-Float Calculation Methodology:**

Total Outstanding Shares XXX

**Less:** Shares held by Directors/sponsors XXX

Government Holdings as promoter/acquirer/

Controller XXX

Shares held by Associated Companies

(Cross holdings) XXX

Shares held with general public in

Physical Form XXX XXX

**Free-Float: XXX**

Notwithstanding to the above calculations, under no circumstances, free-float of a scrip shall exceed its book entry shares, available in the Central Depository System. Share holdings held by investors that would not, in the normal course come into the market for trading shall be treated as "Controlling / Strategic Holdings" and shall not be included in the Free-Float. In specific, the following categories shall be excluded in determination of Free-Float:

- Holdings by promoters / directors / acquirers which has control element

- Holdings by persons / bodies with "Controlling Interest"
- Government holding as promoter / acquirer
- Equity held by associated/group companies (cross-holdings)
- Shares that could not be sold in the open market, in normal course.

**Determining Free-Float Factor:**

The listed companies shall submit their pattern of shareholding, in the prescribed manner, to the Exchange. The Exchange will determine the Free-Float Factor for each such company. Free-Float Factor is a multiple with which the total Free Float market capitalization of a company is adjusted to arrive at the Free-Float market capitalization. Once the Free-Float of a company is determined, it is rounded-off to the higher multiple of 5 and each company is categorized into one of the 20 bands given below

**Free-Float Bands:**

<b>% Free-Float</b>	<b>Free-Float Factor</b>
>0-5%	0.05
>5 —10%	0.10
>10-15%	0.15
>15-20%	0.20
>20-25%	0.25
>25-30%	0.30
>30-35%	0.35
>35 -40%	0.40
>40 -45%	0.45
>45-50%	0.50
>50-55%	0.55
>55 -60%	0.60
>60 -65%	0.65
>65-70%	0.70
>70-75%	0.75
>75-80%	0.80
>80 -85%	0.85
>85-90%	0.90
>90-95%	0.95
>95-100%	1.00

## LIST OF SECTORS

1	Open-end Mutual Funds	20	Oil & Gas Marketing Companies
2	Close-end Mutual Funds	21	Oil & Gas Exploration Companies
3	Modaraba	22	Engineering
4	Leasing Companies	23	Automobile Assembler
5	Investment Bank/ Inv. Cos/ Sec. Cos.	24	Automobile Parts & Accessories
6	Commercial Banks	25	Cable & Electrical Goods
7	Insurance	26	Transport
8	Real Estate Investment Trust	27	Technology & Communication
9	Textile Spinning	28	Fertilizer
10	Textile Weaving	29	Pharmaceuticals
11	Textile Composite	30	Chemical
12	Woollen	31	Paper & Board
13	Synthetic & Rayon	32	Vanaspati & Allied Industries
14	Jute	33	Leather & Tanneries
15	Sugar & Allied Industries	34	Food & Personal Care Products
16	Cement	35	Glass & Ceramics
17	Tobacco	36	Miscellaneous
18	Refinery		
19	Power Generation & Distribution		

### 3. STOCK SELECTION RULES

The selection criteria for stock inclusion in the recomposed KSE100 Index are:

- Rule # 1** Largest Free-Float Capitalisation in each of the **35** Karachi Stock Exchange sectors **excluding Open-end Mutual Fund Sector**;
- Rule # 2** The remaining index places (in this case **65**) are taken up by the largest Free-Float Capitalisation companies in descending order.
- Rule # 3** Company which is on the Defaulters' Counter and/or its trading is suspended, declare Non-Tradable (i.e. NT) in preceding 6 months from the date of recomposition shall not be considered in the recomposition of KSE-100 Index.

A number of the 35 top sector companies may also qualify for inclusion on the basis of

their Free-Float Capitalisation. In other words, companies may qualify solely under rule 1, solely under rule 2, or under both.

The fact that the sector rule is identified as Rule 1 does not imply that it is more important, only that the nature of the selection process is such that it is the screening that is done first.

#### 4. CALCULATION METHODOLOGY

In the simplest form, the KSE100 index is a basket of price and the number of free-float shares. The value of the basket is regularly compared to a starting point or a base period. In our case, the base period is 1st November, 1991. To make the computation simple, the total market value of the base period has been adjusted to 1000 points. Thus, the total market value of the base period has been assigned a value of 1000 points.

An example of how the KSE100 Index is calculated can be demonstrated by using a three-stock sample. **Table I** illustrates the process. First, a starting point is selected and the initial value of the three-stock index set equal to 1000

Taking stock A's share price of Rs. 20 and multiplying it by its total free-float shares of 50 million in the base period provides a market value of one billion Rupees. This calculation is repeated for stocks B and C with the resulting market values of three and six billion Rupees, respectively.

The three market values are added up, or aggregated, and set equal to 1000 to form the base period value. All future market values will be compared to base period market value in indexed form.

#### CALCULATING THE KSE-100

**Step / The Base Period Day 1 TABLE 1**

**Stock Share Price Number of Market Value (in Pak Rs.) FF Shares (in Rs.)**

- A. 20.00 50,000,000 1,000,000,000.00
- B. 30.00 100,000,000 3,000,000,000.00
- C. 40.00 150,000,000 6,000,000,000.00

Total Free-Float Capitalisation 10,000,000,000.00

Note: Base Period Value/Base Divisor = Rs. 10,000,000,000.00 = 1000.00

*\* All figures taken are only hypothetical*

## **Step 2**

Index Value as on Day TABLE 2

**Stock Share Price Number of Market Value (in Rs.) FF Shares (in Rs.)**

A. 22.00 50,000,000 1,100,000,000.00

B. 33.00 100,000,000 3,300,000,000.00

C. 44.00 150,000,000 6,600,000,000.00

Total Free-Float Capitalisation 11,000,000,000.00

$11,000,000,000.00 \text{ Index} = \frac{11,000,000,000.00}{10,000,000,000.00} * 1000 = 1100$

$10,000,000,000.00$

**Thus, the formula for calculating the KSE-100 Index is**

Sum of free-float free-float Shares x Current Price x 1000 Base Period Vale Free-Float  
Capitalisation x 1000 Base Divisor

The KSE100 Index calculation at any time involves the same multiplication of share price and free-float shares for each of the K5E100 Index component stocks. The aggregate market value is divided by the base value and multiplied by 1000 to arrive at the current index number.

## **5. RECOMPOSITION OF THE KSE-100 INDEX**

Maintenance of the index over time will require an on-going semi-annual recomposition process, internal and external- buffer files of shares that exceed (shares outside the index) or fall below (shares inside the index) the above criteria will be maintained under the jurisdiction of the Board of Directors/Management of the Exchange.

Maintaining adequate representation of the under-lying stock market through all of its future development and changes is dependent upon the establishment of an appropriate recomposition process. Recomposition rules fall into two general categories: **Sector Rules** and **Free-Float Capitalisation Rules**.

### **5.1 Sector Rules**

Sector rules govern the selection (or deletion) of companies on the basis of being the top Free-Float Capitalisation stock in each of the **35** PSX sectors (excluding Open-end Mutual Fund sector). Two rules are recommended to undertake selection in this area-one, a time based rule and the other is a value-based rule. Application can be triggered by compliance with either rule.

#### **5.1.1 Time-based rule:**

A company (not in the index) which becomes the largest in its sector (by any amount of value) will enter the index after maintaining its position as largest in the sector for two consecutive recomposition periods.

#### **5.1.2 Value-based rule:**

A company (not in the index) which becomes the largest in its sector by a minimum of 10% greater in capitalisation value than the present largest in the sector (in the index) will enter the index after one recomposition period.

### **5.2 Capitalization Rule**

Capitalization rules govern the selection (or deletion) of companies on the basis of being among the largest free-float capitalization companies in the stock market. Only one rule applies here-time based rule.

#### **5.2.1 Time-based rule:**

A company (not in the index) may qualify for entry if it exceeds the market cap value of the last stock in the index selected on the basis of market cap for two recomposition periods. A qualifying company automatically pushes out the lowest cap selected stock in the index.

### **5.3 Rules for new issues**

A newly listed company or a privatized company shall qualify to be included in the existing index (after one recomposition period) if the Free-Float Capitalisation of the new or privatized company is at least 2% of the total Free-Float Capitalisation.



## AN EXAMPLE OF THE RECOMPOSITION OF THE KSE 100

The base divisor adjustment process can easily be understood by an example mentioned below. It is important to understand that all divisor adjustment are made after the close of trading.

### DIVISOR CHANGES

KSE-100 Index as on Day 2 = 1100 Index Free-Float Capitalisation on Day 2 = 11,000,000,000.00 Divisor as on Day 2 = 10,000,000,000.00

Revised Free-Float Capitalisation due to addition and Deletion of companies on the basis of Sector Base Rule and Free-Float Capitalisation Rule.-Say = Rs. 12,000,000,000.00

As mentioned earlier the Revised Free-Float Capitalisation are the Free-Float Capitalisation of those companies which would constitute the KSE-100 Index on the next day (Day 3). The Revised Free-Float Capitalisation calculated after the end of closing of trading session of Day 2 by using closing prices of the same day.

The key to making this adjustment, as with any divisor adjustment, is that the index value is temporarily frozen' at the close of trading, while the divisor is adjusted for the increase or decrease in market value of the numerator in the formula.

**As the Formula for KSE-100 Index is:**

$$\text{Free-Float Capitalisation Index} = \frac{\text{Free-Float Capitalisation}}{\text{Divisor}} \times 1000$$

Therefore, in order to get the new divisor than formula is reformed as:

Revised Market Cap. - New Divisor =  $\frac{\text{Revised Market Cap.}}{\text{Index}} \times 1000$  (Day 2)

$$12,000,000,000 - \frac{12,000,000,000}{1100} \times 1000 = 10,909,090,909$$

#### **Note:**

The formula for Re-composition of the KSE100 Index is same as mentioned in Table 2, except that the treatment of Base Divisor changes from Base Period Value to an arbitrary number, set such that there is no break in the index series. This will be adjusted for any capital changes in indexed stocks.

## 6. REPLACEMENT OF STOCK IN THE INDEX

In Table 2 the ABC index is calculated for day 2. However, it is assumed that stock D will replace stock B effective at the opening of trading on day 3. Therefore, the divisor adjustment is made, as shown, after the close of trading on day 2., stock D's price, free-float shares, and resulting market value are also as of the close of trading on day 2.

By adding stock D, a stock twice the market value of B, the new base divisor increases

substantially as the aggregate market value increases proportionately, while the index remains unchanged. Thus, the impact on the price index of stock D, isn't felt until 3rd day's trading begins.

KSE-100 Index as on Day 2 = 1100 KSE-100 Index Market Cap. of (A.B.&C) on Day 2 =

11,000,000,000

Divisor as on Day = 10,000,000,000

**Step 1.** Replace stock B with stock D after the close of trading on Day 2. TABLE

**Stock Share Price Number of Market Value (in Rs.) Free Float FF Shares (in Rs.)**

A. 22.00 50,000,000 1,100,000,000.00

D. 40.00 150,000,000 6,000,000,000.00

C. 44.00 150,000,000 6,600,000,000.00

Revised Free-Float Capitalisation of Index **13,700,000,000.00**

New Divisor = Revised Free-Float Capitalisation of Index x 1000 Index

13,700,000,000.00 x 1000 = 12,454,545,455 1100 The newly adjusted divisor is indeed larger, while the index values remain the same during this non-trading interval.

**Step 2**

Application of new Divisor on Day 3. TABLE 4

**Stock Share Price Number of Market Value (in Rs.) FF Shares (in Rs.)**

A 22.50 50,000,000 1,125,000,000.00

B.41.00 150,000,000 6,150,000,000.00

C 44.50 150,000,000 6,675,000,000.00

Total 13,950,000,000.00

Free-Float Capitalisation Index as on 3rd Day = x 1000 Divisor

13,950,000,000.00 x 1000 = 1120 12,454,545,455

## 7. DIVIDEND, BONUS AND RIGHT ADJUSTMENTS

### 7.1 Dividend Adjustment

If company A has declared 10% cash dividend and its Book Closure Date starts from day 4 then it will be adjusted after the close of Day 3.

KSE-100 Index as on Day 3 = 1120 KSE-100 Index Free-Float Capitalisation on Day 3 =

13,950,000,000 Divisor as on Day 3 = 12,454,545,455

#### **Step 1**

Determine the ex-dividend price of the stock A to calculate the revised Free-Float Capitalisation and a new divisor for the next day i.e. Day 4

#### **Stock A**

Par value: Rs. 10 **per share** Market value on Day 3: Rs 22.50 **per share**

Cash Dividend: 10 %

i) Cash dividend amount per share = Par Value x dividend% = Rs 10 x 10% = Re.1

ii) Ex-dividend price = Market price - cash dividend amount = 22.50-1 = 21.50

#### **Step 2**

Share price of A is adjusted after the close of Day 3 to calculate the New Divisor for the next day (i.e. Day 4)

TABLE 5

**Stock Share Price Number of Market Value(in Rs.) Shares (in Rs.)**

A.	21.50	50,000,000	1,075,000,000.00
B.	41.00	150,000,000	6,150,000,000.00
C.	44.50	150,000,000	6,675,000,000.00

Revised Free-Float Capitalisation 13,900,000,000.00

New Divisor = Revised Market Cap. x 1000 Index as on

Day 3

New Divisor = 13,900,000,000.00 x 1000 = 12,410,714,285 1,120

**Step 3** Index Value as on Day 4. TABLE 6

**Stock Share Price\* Number of Market Value (in Rs.) FF Shares (in Rs.)**

A. 22.00\* 50,000,000 1,100,000,000.00

B. 41.00 150,000,000 6,150,000,000.00

C. 44.50 150,000,000 6,675,000,000.00

Free-Float Capitalisation 13,925,000,000.00

Index = Free-Float Capitalisation x 1000 / New Divisor

Index = 13,925,000,000 x 1000 = 1,12212,410,714,285

\* We have assumed that the prices of other stock remain constant.

## 7.2 Bonus Adjustment

If company A has declared 10% Bonus shares its Book Closure Date starts from day 4 then it will be adjusted after the close of Day 3.

KSE-100 Index as on Day 3 = 1120

KSE-100 Index Free-Float Capitalisation on Day 3 = 13,950,000,000 Divisor as on Day 3 = 12,454,545,455

### Step 1

Determine the Ex-Bonus price of the stock A to calculate the revised Free-Float Capitalisation and a new divisor for the next day i.e. Day 4.

Stock A Market value on Day 3: Rs 22.50 Bonus: 10%

For simplicity in working, we will calculate the Ex-bonus price on the basis of a lot of 100 shares.

Total shares after the Bonus issue  $100 \text{ shares} + (100 \text{ shares} \times 10 \% \text{ Bonus}) = 110 \text{ shares}$

ii. Cost of a lot (100 shares)

$100 \text{ shares} \times \text{market price of A} = 100 \times 22.50 = \text{Rs. } 2250$

iii. Ex Bonus price per share =  $2250/110 = \text{Rs. } 20.45$

### **Step 2**

Calculation the total number of free-float shares after the Bonus issue.

Total number of shares on Day 3 + (Bonus % x total number of shares on Day 3) =  $50,000,000 + (10\% \times 50,000,000) = 55,000,000 \text{ shares}$

### **Step 3**

Share price and the total number of free-float shares of A is adjusted after the close of Day 3 to calculate the New Divisor for the next day (i.e. Day 4).

TABLE 7

#### **Stock Share Price Number of Market Value (in Rs.) FF Shares (in Rs.)**

A. 20.45 55,000,000 1,124,750,000 B. 41.00 150,000,000 6,150,000,000 C. 44.50  
150,000,000 6,675,000,000

Revised Free-Float Capitalisation 13,949,750,000

New Divisor = Revised Market Cap. x 1000

Index as on Day 3

13,949,750,000

New Divisor =  $\frac{13,949,750,000}{1000} = 13,949,750$

**Step 4** Index Value as on Day 4. TABLE 8

#### **Stock Share Price Number of Market Value (in Rs.) FF Shares (in Rs.)**

A. 21.00 55,000,000 1,155,000,000 B. 41.00 150,000,000 6,150,000,000 C. **44.50**  
150,000,000 6,675,000,000

Free-Float Capitalisation 13,980,000,000

Index = Free-Float Capitalisation x 1000

New Divisor

13,980,000,000

Index = -----x 1000 = 1122.42 12,455,1

33,928

### 7.3 DIVIDEND & BONUS ADJUSTMENT (Simultaneously)

If company A has declared 10% Cash Dividend and 10 % Bonus shares and its Book Closure Date starts from day 4 then it will be adjusted after the close of Day 3.

KSE-100 Index as on Day 3 = 1120 KSE-100 Index Free-Float Capitalisation on Day 3 = 13,950000,000 Divisor as on Day 3 = 12,454,545,455

#### Step 1

Calculate the Ex-Dividend and Ex-Bonus price of A.

1 The Ex-Dividend price of stock A shall be calculate in the same pattern as mentioned in the Step 1 of section 7.1 i.e. Rs. 21.50

2 Calculate the Ex-Bonus price of A:

For simplicity in working , we will calculate the Ex-bonus price on the basis of a lot of 100 shares.

i. Total shares after the Bonus issue  $100 \text{ shares} + (100 \text{ shares} \times 10 \% \text{ Bonus}) = 110$  shares

ii. Cost of a lot (1 00 shares)  $100 \text{ shares} \times \text{Ex-Dividend price of A}$   
 $= 100 \times 21.50 = \text{Rs. } 2150$

Ex Dividend and Ex- Bonus price per share =  
 $2150/110 = \text{Rs. } 19.54$

#### Step 2

Calculate the total number of free-float shares after the Bonus issue. Total number of shares  
 + Total number of shares x Bonus% = 50,000,000 + (50,000,000 x 10% Bonus) = 55,000,000  
 shares

### Step 3

Share price and the total number of shares of A is adjusted after the close of Day 3 to calculate the  
 New Divisor for the next day (i.e. Day 4)

TABLE 9

**Stock Share Price Number of Market Value (in Rs.) FF Shares (in Rs.)**

A. 19.54 55,000,000 1,074,700,000

B. 41.00 150,000,000 6,150,000,000

C. 44.50 150,000,000 6,675,000,000

Revised Free-Float 13,897,700,000 Capitalisation

New Divisor = Revised Market Cap. x 1000 Index as on Day 3

New Divisor = 13,897,700,000 x 1000 = 12,410,446,428 1120

### Step 4

Index Value as on Day 4.

TABLE 10

**Stock Share Price Number of Market Value(in Rs.) FF Shares (in Rs.)**

A. 20.00 55,000,000 1,100,000,000

B. 41.00 150,000,000 6,150,000,000

C. 44.50 150,000,000 6,675,000,000

Free-Float Capitalisation 13,925,000,000

Index = Free-Float Capitalisation x 1000New Divisor  
 Index = 13,925,000,000 x 1000 = 1122.03 12,410,446,428

## **1.1 RIGHT ISSUE ADJUSTMENT**

The Right issues of the companies which constitute the KSE 100 Index are adjusted in two stages. At first stage the Ex-Right price is adjusted and at the second stage the capital (outstanding shares) are adjusted. A brief detail about the right issues are mentioned below:

The company which declares Right shares have to close its books (share holders register) to determine entitlement within 45 days of its declaration.

At the date of book closure, the Ex—Right price is ascertained and if the company belongs to the KSE 100 Index then the Divisor is adjusted due to the Ex-Right price of the company.

When the company informs the Exchange that it has dispatched Letter of Rights Offer to the shareholders, the trading in the Letter of Rights Offer Un-paid are commenced. A separate block of capital, Un-Paid-Right, is formed equal to amount of right issue and the trading continues till next 45 days or till the last date of payment.