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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 33 Sectors, 32 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 66 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 KSE recommended to the governing board of directors of the Karachi Stock Exchange (KSE) in early 2012 to implement the KSE-100 Index on the basis of free-float market capitalization. In the meeting held on April 24th, 2012, the governing KSE Board ratified the IEC recommendation. The Free-float based KSE-100 was calculated parallel to the full-cap KSE-100 Index since 1st June 2012 and the recomposed KSE-100 Index based on free-float methodology effective from October 15th 2012. In this transition, the Rules for composition and recomposition 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:

% Free-Float	Free-Float Factor
> 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	19	Health Care Equipment and Services
2	Oil and Gas	20	Pharma and Bio Tech
3	Chemicals	21	Media
4	Forestry and Paper	22	Travel and Leisure
5	Industrial Metals and Mining	23	Fixed Line Telecommunication
6	Construction and Materials	24	Electricity
7	General Industries	25	Gas Water and Multiutilities
8	Electronic and Electrical Equipment	26	Banks
9	Industrial Engineering	27	Non Life Insurance
10	Industrial Transportation	28	Life Insurance
11	Support Services	29	Real Estate Investment and Services
12	Automobile and Parts	30	Financial Services
13	Beverages	31	Equity Investment Instruments
14	Food Producers	32	Software and Computer Services
15	Household Goods	33	Technology Hardware and Equipment
16	Leisure Goods		
17	Personal Goods		
18	Tobacco		

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 **32** Karachi Stock Exchange sectors **excluding Open-end Mutual Fund Sector**;

Rule # 2 The remaining index places (in this case **68**) 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 **32** 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 1** 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 1

The Base Period Day 1

TABLE 1

Stock	Share Price (in Pak Rs.)	Number of FF Shares	Market Value (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 2

TABLE 2

Stock	Share Price (in Rs.)	Number of FF Shares	Market Value (in Rs.)
A.		22.00 50,000,000	1,100,000,000.00
B.	33.00	100,000,000	3,300,000,000.00
		150,000,000	6,600,000,000.00
Total Free-Float Capitalisation			11,000,000,000.00

11,000,000,000.00

Index = $\frac{11,000,000,000.00}{10,000,000,000.00} = 1.10 * 1000 = 1100$

10,000,000,000.00

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

$$\frac{\text{Sum of free-float free-float Shares x Current Price}}{\text{Base Period Value}} \times 1000$$

Or

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

The KSE100 Index calculation at any time involves the same multiplication of share price and free-float shares for each of the KSE100 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 **32** KSE 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 KSE100

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:

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

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

$$\begin{aligned} \text{New Divisor} &= \frac{\text{Revised Market Cap.}}{\text{Index (Day 2)}} \times 1000 \\ &= \frac{12,000,000,000}{1100} \times 1000 \\ &= 10,909,090,909 \end{aligned}$$

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 day2.

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 2	=	10,000,000,000

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

TABLE 3

Stock Float	Share Price FF Shares	Number of (in Rs.)	Market Value	(in Rs.) Free
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	<u>6,600,000,000.00</u>	
Revised Free-Float Capitalisation of Index				<u>13,700,000,000.00</u>

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

$$= \frac{13,700,000,000.00}{1100} \times 1000 = 12,454,545,455$$

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 (in Rs.)	Number of FF Shares	Market Value (in Rs.)
A	22.50	50,000,000	1,125,000,000.00
B.	41.00	150,000,000	6,150,000,000.00
			6,675,000,000.00

Total			13,950,000,000.00

Free-Float Capitalisation

$$\text{Index as on 3rd Day} = \frac{\text{Market Value}}{\text{Divisor}} \times 1000$$

$$= \frac{13,950,000,000.00}{12,454,545,455} \times 1000 = 1120$$

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 (in Rs.)	Share Price Shares	Number of (in Rs.)	Market Value
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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 = $\frac{\text{Revised Market Cap.}}{\text{Index as on Day 3}} \times 1000$

New Divisor = $\frac{13,900,000,000.00}{1,120} \times 1000 = 12,410,714,285$

Step 3

Index Value as on Day 4.

TABLE 6

Stock	Share Price* (in Rs.)	Number of FF Shares	Market Value (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 = $\frac{\text{Free-Float Capitalisation}}{\text{New Divisor}} \times 1000$

Index = $\frac{13,925,000,000}{12,410,714,285} \times 1000 = 1,122$

* 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.

- i. 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 (in Rs.)	Number of FF Shares	Market Value (in Rs.)
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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 = $\frac{\text{Revised Market Cap.}}{\text{Index as on Day 3}} \times 1000$

$\frac{13,949,750,000}{1120} \times 1000 = 12,455,133,928$

Step 4

Index Value as on Day 4.

TABLE 8

Stock	Share Price (in Rs.)	Number of FF Shares	Market Value (in Rs.)
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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 = $\frac{\text{Free-Float Capitalisation}}{\text{New Divisor}} \times 1000$

$\frac{13,980,000,000}{12,455,133,928} \times 1000 = 1122.42$

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	= 13,950,000,000
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
 $100 \text{ shares} + (100 \text{ shares} \times 10 \% \text{ Bonus}) = 110 \text{ shares}$
- ii. Cost of a lot (100 shares)
 $100 \text{ shares} \times \text{Ex-Dividend price of A}$
 $= 100 \times 21.50$
 $= \text{Rs. } 2150$
- iii. 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.

$$\begin{aligned} &\text{Total number of shares} + \text{Total number of shares} \times \text{Bonus\%} \\ &= 50,000,000 + (50,000,000 \times 10\% \text{ Bonus}) \end{aligned}$$

= 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 (in Rs.)	Number of FF Shares	Market Value (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 Capitalisation			13,897,700,000

$$\text{New Divisor} = \frac{\text{Revised Market Cap.} \times 1000}{\text{Index as on Day 3}}$$

$$\text{New Divisor} = \frac{13,897,700,000 \times 1000}{1120} = 12,410,446,428$$

Step 4

Index Value as on Day 4.

TABLE 10

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

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

$$\text{Index} = \frac{13,925,000,000}{12,410,446,428} \times 1000 = 1122.03$$

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.