CONVENTIONS AND CALCULATION METHODOLOGY FOR THE BSE TOTAL RETURN INDICES
1. **STOCK SELECTION AND ELIGIBILITY**

1.1. The BSE’s total return indices, Domestic Company Total Returns Index (DCTRI), Domestic Financial Sector Index (DFSI), Foreign Resource Sector Index (FRSI) and Local Asset Status Index (LASI) are equity indices computed using market capitalization as the weighting methodology.

1.2. The indices are computed on a total returns basis, capturing price appreciation as well the impact of dividends.

1.3. The DCTRI comprises all the domestic stocks listed on the domestic main board and on the domestic venture capital board.

1.4. The DFSI comprises all the domestic financial services stocks listed on the domestic main board and on the domestic venture capital board.

1.5. The FRSI comprises all the mining and energy stocks listed on the foreign main board and on the foreign venture capital board.

1.6. The LASI comprises all the stocks listed on the domestic board and those listed on the foreign boards that have been granted local asset status.

1.6.1. Constituents of the LASI are to be included or deleted the working day following the publishing of the X-News circular informing the market that a security has been granted or revoked of the Local Asset Status by the Non-Bank Financial Institutions Regulatory Authority (NBFIRA).

1.7. The indices include stocks right from the date of listing and exclude stocks from the date of the delisting (the morning after).

1.8. The base date for DFSI, FRSI and LASI DCI is 1 February 2008 while the base date for the DCTRI is 1 January 2010.

1.9. The base index level for all total return indices is 1000.00 points.

2. **COMPUTATION OF INDEX WEIGHTS**

2.1. The total return indices are computed to capture the daily changes in the total returns of the stocks (price appreciation plus dividends and interest) estimated by the daily changes in the total market capitalization and the payment of dividends.

2.2. In the case of variable loan stocks, the dividend component includes all the payouts received by unitholders including interest.

2.3. Market capitalization is defined as the daily weighted price multiplied by the number of securities outstanding on a daily basis.

2.4. The closing price is computed as stated in section 10.1 of the BSE Equity Trading Rules.
2.5. Where a stock is listed but is not traded the weighted price is defined as the issue price in the case of an IPO or the reference price in the case of a secondary listing of a foreign stock.

2.6. In the case of a secondary listing the price in the primary market is converted to a Pula price using the exchange rate from Bank of Botswana (for USD, GBP, EURO, ZAR) or from Bloomberg for other currencies.

3. **COMPUTATION OF THE BASE MARKET CAPITALIZATION**

3.1. The base is computed as at the base date.

3.2. Once computed the base is held constant and it only changes when there is a corporate action that results in a change in the number of securities.

3.3. The rationale for re-basing is to separate the impact of the change in price on the market cap from the impact of the change in the number of securities on the market capitalization.

3.4. The base market capitalization on the base date is computed as the closing price multiplied by the total number of shares for each stock on the base date, and divided by the index from the previous day.

3.5. The base market capitalization computed as at the base date is therefore the same as the current market capitalization as at the base date divided by the index from the previous day.

4. **COMPUTATION OF THE BASE DURING CORPORATE ACTIONS**

4.1. Corporate actions referred to inhere include rights issues, scrip dividend, bonus issues, share option schemes, new listings and delistings.

4.2. These are actions that result in the increase or decrease in the outstanding number of shares.

4.3. In the event of a corporate action, the new base will be computed following the procedure below.

4.4. Firstly, the total market capitalization (of all the stocks in the index, excluding the stock involved in the corporate action) of the day prior to the corporate action is determined.

4.5. Secondly, the total number of shares arising from the corporate action is determined.

4.6. The resultant number of shares is then multiplied by the closing price the day prior to the corporate action.
4.7. The two market capitalizations (4.4 and 4.6) are added together to arrive at the total market capitalization at the beginning of the day of the corporate action.

4.8. The total market capitalization at the beginning of the day of the corporate action is then divided by the price index the day prior to the corporate action.

4.9. This gives the new base market capitalization at the beginning of the day of the corporate action.

4.10. This figure will become the new base market capitalization as from the day of the corporate action until the next corporate action.

4.11. Where there is more than one corporate action on the day, the beginning of day market capitalizations for the stocks, computed as indicated above, are added together before dividing by the price index the day prior to the corporate actions.

4.12. The same methodology applies when there is delisting.

4.13. With a delisting the change in the number of securities is negative and this results in a deduction of the proportionate market capitalization of the delisted entity from the total market capitalization of the day prior to the corporate action.

4.14. And then the division by the price index the day prior to the corporate action to arrive at the new base market cap at the beginning of the day of the corporate action.

4.15. The treatment of corporate actions is as detailed in Table 1 below:

4.15.1. On Day t, Security A undertakes a rights issue resulting in an increase in the total number of shares in issue.

**TABLE 1: REBASING DURING A RIGHTS ISSUE – AN ILLUSTRATION WITH SECURITY A**

**Day t-1 (Evening)**

<table>
<thead>
<tr>
<th>Security</th>
<th>Price</th>
<th>Total Number of Shares</th>
<th>Total Mkt. Cap.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>14</td>
<td>100</td>
<td>1400</td>
</tr>
<tr>
<td>B</td>
<td>12</td>
<td>200</td>
<td>2880</td>
</tr>
<tr>
<td>C</td>
<td>8</td>
<td>150</td>
<td>960</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>5240</strong></td>
</tr>
</tbody>
</table>

Index on Day t-1 (Evening) 1082.60
Day: Adjustment for Security A Rights Issue (Morning)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>14</td>
<td>280</td>
<td>5240</td>
<td>1082.60</td>
<td>5520</td>
<td>(5520/1082.60)*1000 = 5098.84</td>
</tr>
</tbody>
</table>

Note: This market capitalization is kept constant until the next corporate action.

5. COMPUTATION OF THE PRICE INDEX

5.1. The inputs required to compute the index are current market capitalization and the base market capitalization.

5.2. The base market capitalization is computed using the methodology described in Section 3 above.

5.3. The market capitalization for each stock on the base date, and for every day thereafter, is computed the number of shares outstanding daily multiplied by the closing price each day.

5.4. Note that the market capitalization for each stock will change each day as a result of the change in weighted prices, if any. However, the number of shares remains constant each day, unless there are any corporate actions.

5.5. The result from this computation becomes the numerator in the index computation formula shown below – being the current total market capitalization or daily total market capitalization.

5.6. The denominator is the base market capitalization.

5.7. So on the base date, the base market capitalization is same as the current market cap and the price index on this date is 1000.00 points.

5.8. The computations of the price index is detailed in Table 2 below.

**TABLE 2: COMPUTATION OF PRICE INDICES: DAY T (EVENING)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>18 Note</td>
<td>120</td>
<td></td>
<td>2160</td>
</tr>
<tr>
<td>B</td>
<td>12</td>
<td>12</td>
<td>200</td>
<td></td>
<td>2400</td>
</tr>
<tr>
<td>C</td>
<td>8</td>
<td>8</td>
<td>150</td>
<td></td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>As determined by re-basing on Day T (Morning)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Assumes the price of Security A increased from P14.00 to P18.00 at EOD
Price Index = \frac{\text{Total Market Capitalization}_{\text{current}}}{\text{Total Market Capitalization}_{\text{base}}} \times \text{Base Index}

Or

\[ \text{PI} = \frac{\text{MC}_t}{\text{MC}_b} \times N \]

Where:
- \( \text{PI} \) = price index
- \( \text{MC}_t \) = current market capitalization
- \( \text{MC}_b \) = base market capitalization
- \( N \) = base index

\[
\text{Price Index} = \frac{5760}{5098.94} \times 1000 = 1129.65 \text{ points}
\]

6. **ADJUSTMENT FOR DIVIDENDS**

6.1 When a dividend is paid an adjustment has to be made to reflect the dividend amount commensurate with the stock’s number of shares and to subsequently convert the gross dividend amount into index points.

6.2 A dividend is accounted for in the index as at the Ex-Dividend date, which falls two trading days before the Last Date to Register (LDR).

6.3 In the case of a dividend declared in a foreign currency, the dividend will be converted to Pula using the exchange rate specified by the issuer in the Notice of Dividend Currency Exchange Rate. However, if such a notice is not released by the ex-dividend date, then the dividend will be converted to Pula using the spot exchange rate of the ex-dividend date from Bank of Botswana (for CHN, EURO, GBP, USD, YEN and ZAR) or from Bloomberg for other currencies.

6.4 For foreign currencies other than the six available on the Bank of Botswana website, the foreign currency per USD rate will be sourced from Bloomberg and in turn converted to the foreign currency per Pula rate using the USD per Pula rate sourced from the Bank of Botswana website. The exchange rate sourced from Bloomberg should be as at 5am East Time (EDT) or 11am Greenwich Mean Time + 2 hours (GMT+2).
6.5 The dividend per share is multiplied with the number of shares on the Ex-Dividend date to give the total value of the dividend on the Ex-Dividend date.

6.6 The total dividend amount is then converted into index points by dividing the total dividend amount by the prevailing base market cap on the Ex-Dividend date.

6.6.1 The dividend amount is converted into index points using the methodology illustrated below:

TABLE 3: CONVERSION OF DIVIDENDS INTO INDEX POINTS (ON DAY T)

<table>
<thead>
<tr>
<th>Security</th>
<th>Dividend Per Share (Pula)</th>
<th>Number of Shares</th>
<th>Total Dividends (Pula)</th>
<th>Mkt. Cap. Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.4500</td>
<td>80</td>
<td>36</td>
<td>5098.84</td>
</tr>
</tbody>
</table>

Dividend Adjustment (XD) = \[ \frac{\sum_{i=1}^{N} G_i W_i N}{M_b} \]

Where:

- \( G_i \) = Dividend per share of the \( i^{th} \) company
- \( W_i \) = Number of ordinary shares issued by the \( i^{th} \) company
- \( M_b \) = Base market capitalization of the constituent stock
- \( N \) = Base index

Dividend Adjustment (XD) = \( \frac{\text{Total Dividends Stock A}}{\text{Total Market Capitalisation base}} \)

Dividend Adjustment (XD) = \( \frac{36 \times 1000}{5098.84} = 7.06 \text{ points} \)

6.7 The dividend points are added to the price index on the Ex-Dividend date as a component in the total return index computation formula illustrated below.

6.7.1 The total return index is computed using the formula shown below:
\[ TRI_t = \frac{TRI_{t-1}}{PI_{t-1}} \times (PI_t + XD_t) \]

Where:

- \( TRI_t \) = Total Return Index value today
- \( TRI_{t-1} \) = Total Return Index value yesterday
- \( PI_t \) = Underlying price index today
- \( PI_{t-1} \) = Underlying price yesterday
- \( XD_t \) = Ex dividend adjustment on \( t \) as computed in Table 3 above

\[ Total \ Return \ Index = \frac{1082.60}{1082.60} \times (1129.67 + 7.06) = 1136.73 \text{ points} \]