Petra Treasury Index Methodology

1. Index Specifications

- The Petra Treasury Index is a rule-based, market value weighted index created to measure the performance of cedi denominated Government of Ghana bonds and notes with time to maturity less than 364 days.
- The Petra Treasury Index will provide users with the following;
    a. Benchmark for active and passive Government of Ghana treasury portfolios.
    b. Informational measures of Government of Ghana treasury market performance.
    c. Reference targets for passive investment strategies and index linked products.

1.1 Initial Value

- The Petra Treasury Index will be calculated every business day starting on the 1^{st} of December 2019, with the index value based on 1,000 as at the close of trading on 1^{st} of December 2019.

1.2 Distribution

- Index values will be calculated and distributed daily via Petra Trust Company Limited website and mailing list.

1.3 Pricing and Performance

- Constituent securities will be priced at amortized cost. The amortization methodology used is linear interpolation.
- Return on constituent securities will be measured using yield to maturity.

1.4 Weighting

- The constituent bonds are weighted according to their respective market value in proportion to the aggregated market values of all constituent bonds in the Index.

- $Market\ Value_{Bond} = (Price_{Bond} + Accrued\ Interest_{Bond}) * Par\ Amount\ Outstanding_{Bond}$

1.5 Historical Data

- Historical data will be maintained from the 1st of December 2019.

2. Composition of the Index (selection, rebalancing and reconstitution)

2.1 Selection of the index components

All eligible Government of Ghana bonds will be added at the start of the index. The index will have an adjustment day which falls on the last business day of each month. New bonds issued prior to the adjustment day and which meet the selection criteria defined below will be added on adjustment day. Additionally, on the adjustment day, the index committee will evaluate whether all current constituent securities still meet the requirements for selection. Constituent securities that do not meet the selection criteria will be removed from the index on the adjustment day.

2.2 Petra Treasury Index Selection Criteria:

- Bonds must be issued by the Government of Ghana, issued on the domestic market, denominated in Ghana Cedi and must have a time to maturity less than or equal to 364 days.
- Bonds must have fixed rate periodic coupon with bullet principal payments.
- Bonds must be listed on the Ghana Fixed Income Market.
- Bonds with partial or fully amortizing principal payment structures will not be included in the index.
- Floating rate bonds, step-up coupon bonds, index linked coupon bonds, payment-in-kind coupon bonds and deferred coupon bonds will not be included in the index.
- Bonds with embedded options will not be included in the index.
- Securitized bonds will not be included in the index.

2.3 Rebalancing and Adjustment Rules

- The composition of the Index is periodically rebalanced (monthly) on the adjustment day, which falls on the last business day of each month. This will offer intra month stability to index composition. The index settlement date is set for the first calendar day of the following month.
- Constituent securities will be held constant throughout the month from the previous index adjustment date. This fixed universe will be used to calculate daily and monthly index returns and is the basket of bonds against which fund managers will be measured.
- Eligible bonds issued but not necessarily settled on or before the month-end adjustment date will qualify for inclusion in the following month's index, provided the required security's reference information and pricing are readily availability.
- Gross index turnover, which measures the index composition shift will be measured using the market values of bonds leaving and entering the index (as a percentage of the index's beginning market value).
- Intra-month cash payments into the index (coupon and principal payments) earns no reinvestment return during the month.
- Any accumulated coupon payment is stripped out of the index on adjustment day and effectively reinvested pro rata across the entire index for cumulative returns purposes. Cumulative returns for periods longer than one month reflect monthly compounding.
- Any accumulated principal payments are redeemed from the index on the adjustment day.
- New bonds eligible to enter the index are added on the adjustment day for settlement on the first calendar day of the following month. This will enable the index to reflect the latest set of eligible securities on a monthly basis.

3. Index Calculation and Return Aggregation

3.1 Index Formula

- The Petra Treasury Index is a standard total return index with market value weights and recognizes price changes, accrued interest and other cash payments.

- The total return is calculated by aggregating the interest return, reflecting the accrued interest, and price return, reflecting the gains or losses due to changes in the indicative price quotes.

Formula:

$Total\ Return\ (TR_i) = (MVE_i - MVB_i)/MVB_i$

$Weight\ (W_i) = MVB_i/\sum_{i=1}^{n} MVB_i$

$Index_t = Index\ _{t-1} * (1 + \sum_i^n Total\ Return_{i,t} * Weight_{i,t-1})$

Where:

$MVE_i = Market\ Value\ of\ security\ i\ at\ period\ end$

$MVB_i = Market\ Value\ of\ security\ i\ at\ begining\ of\ period$

$MV_i = Market\ Value\ of\ security\ i$

$W_i = Market\ capitalisation\ of\ security\ i$

$Market\ Value_{Bond} = (Price_{Bond} + Accrued\ Interest_{Bond}) * Par\ Amount\ Outstanding_{Bond}$