BANK *Of* ZAMBIA

SECONDARY MARKET RULES AND PRACTICES OF THE ZAMBIAN GOVERNMENT SECURITIES MARKET (ZGS)

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1.0 INTRODUCTION

The Zambian market for government securities has been operating for some time, however the secondary market has not performed to expectation of both policy makers and practioners. Financial markets in emerging markets are reputed for professionalism and efficiency and participants in the Zambian Government Securities (ZGS) secondary are striving to maintain the pace of development in this market. To this effect, Bank of Zambia in consultation with the market participants have developed market rules that will guide participants in this market It is expected that the rules and market practice will be follow by all to ensure efficiency in the market and contribute to the overall secondary market development. .

2.0 RULES OF CONDUCT FOR PARTICIPANTS

2.1 Confidentiality and integrity

The preservation of confidentiality and maintenance of integrity at all times by a participant is essential for proper conduct of business in government securities market.

a) A dealer shall not , in any circumstances, commit any act that constitute a breach of confidentiality, such as disclosing the name, size of transactions or profits/losses of a client to another dealer or third party.

2.2 Market making procedures

a) All dealers must show a commitment to participate actively as market makers over the long term.
b) Dealers must quote continuous two-way pricing in all market conditions.
c) Quotes by a dealer are considered firm, unless otherwise stated.
d) The party, to whom firm quotes are directed, must either promptly deal at the quoted bid/offer price or inform the dealer making the quotes that they are not interested to deal at those prices.

3.0 CLIENTS ORDERS

3.1 Orders

A client may deal at the bid and offer prices quoted by a dealer or place an order to buy or to sell a security at the market price or at a price limit within a certain time period.

4.0 OUTRIGHT TRANSACTIONS

4.1 Dealing practice

4.1.1 Price quotation

a) Government bonds are traded on a price basis but settled on a price “plus accrued interest” basis. Prices are to be quoted in multiples of K5,000,000.00 for all transactions

Prices will be based on the transacted yields and these shall be expressed to four decimal places.

b) Treasury bills shall be quoted on a rate of discount basis, in percentage terms, expressed to four decimal places. The resultant prices are to be expressed to four decimal places.

4.1.2 "Market lot" transactions

a) The standard market lot between dealers shall be ZMK 500 million for current and off the run government bonds and Treasury bills.

b) The standard market lot between a dealer and any other investor shall be K1,000, 000.00 for current and off the run government bonds and treasury bills.

4.2 Value Date

4.2.1 Normal value date

The normal value date shall be the business day following the transaction date T+2 unless otherwise stated at the time of dealing

4.3 Business hours

4.3.1 Regular trades

The normal business hours for regular trades (next business day settlement) are as follows:

08:45 hours to 16:00 hours from Mondays to Fridays.

4.3.2 Cash trades

The normal business hours for cash trades (same day settlement) are as follows:

08:45 hours to 16:00 hours from Mondays to Fridays.

4.4 Confirmation of deals

4.4.1 For all interbank transactions, the seller shall create a deal ticket which shall be transmitted to the counterparty.

4.4.2 For all transactions between a commercial bank and its clients, the bank shall create a sale/purchase ticket that shall be transmitted to its customer.

4.4.3 For all transactions between all other participants, the seller shall create a sale ticket that shall be transmitted to its counterparty

4.5 Settlement of Treasury bills transactions

4.5.1 All interbank transactions, the seller shall fill the Securities transfer form (Appendix 1) and transmitted to the Bank of Zambia for the movement of securities to the buyer in the Central Securities Depository. The buyer will simultaneously transmit cash settlement instructions to Bank of Zambia.

4.5.2 All transactions between a commercial bank and its clients, the bank shall fill the securities transfer form that shall be transmitted to Bank of Zambia for the movement of securities to and fro customers account. The bank and it client will settle the funds within their books.

4.5.3 All transactions between all other participants registered in the book entry system at the Bank of Zambia, the seller shall fill the securities transfer form and transmit it to Bank of Zambia for securities transfer. The participants shall settle the funds through their respective commercial banks.

4.6 Settlement of bonds transactions

4.6.1 All sellers of Government Bonds shall fill the securities transfer form and transmit it to the Bank of Zambia via LuSE for the movement of securities to the buyer. The LuSE will transmit to the Bank of Zambia cash recap report for cash settlement.

4.7 Rejection or confirmation of deals by buyers

For interbank transactions, the buyer shall on receipt of a sale ticket acknowledge after checking the details on the ticket are correct through stamping the ticket and transmit it back to the seller. Otherwise, the buyer shall reject the ticket and inform the seller of any disagreement, errors or omission immediately.

4.8 Amendments or Cancellation

When a transaction has been rejected by a buyer because of some error, omission or disagreement, both parties shall immediately examine and resolve the matter. Upon resolving the matter, the seller shall create a new sale ticket and transmit it to the buyer for confirmation.

In an event that the dispute can not be resolved between the two parties concerned, the matter shall be referred to the Government securities committee of the Bankers Association of Zambia (BAZ) and the costs, if any, shall be borne equally by the two parties involved.

4.9 Interest calculations

4.9.1 Coupon interest

Coupon interest payments for bonds shall be made semi annually on a business day. Where the settlement day is a public holiday, falls on a Saturday or Sunday settlement will be effected on the next business day.

Accrued interest on the bond is calculated from and including the starting date when the bond was issued up to the 182nd day for the first coupon interest payment, for 183rd for the second interest payment.

4.9.2 Day count conversion

The day count conversion to be followed for purposes of calculating interest on bonds shall be Actual/365. This means that in a leap year the actual number of days in the year shall be 365 instead of 366.

In all transactions for bonds, fractions of a ngwee equalling or exceeding one-half of a ngwee shall be rounded up to one ngwee, and fractions of a ngwee less than one-half of a ngwee shall be disregarded.

Example

K1, 257, 000.3750 shall be rounded to K1, 257, 000.38

K1, 527,000.3748 shall be rounded to K1, 527, 000.37

APPENDIX I
BONDS/TREASURY BILLS TRANSFER FORM

BOZ FORM T

Date……

The Director
Financial Markets Department
Bank of Zambia
Box 30080
LUSAKA

Dear Sir

TRANSFER OF TREASURY BILLS/BONDS

Kindly transfer value……K…….(……) from our Treasury bills/ collateral account bought on tender number ……. at ……. for 28 / 91 / 182 / 273 days maturing on …….to ……..

The address of the beneficiary is as follows

Physical address ……..
……
…….. ……..

For and on behalf of ……
……..
…….

Name ……. Name ……
Signature ……. Signature ……

MEMORANDUM ITEMS

a. An outright sale to counter party at the price of …… for the face value of K……
b. Sale on Repurchase Agreement basis for ……..days attracting an interest of …….percent per annum.
c. Security on loan obtained from the counter party attracting an interest of ……percent per annum.
d. Release of collateral security placed on us on …….. attracting an interest rate of …….percent per annum.
e. Collateral requirement for clearing

APPENDIX II
Formulae

TREASURY BILLS

Discount Rate

The discount rate is the discount amount divided by the face value expressed as a percentage annualized using a 365 – day year.

$$DR = \left(\frac{F - P}{F} \right) \times \frac{D}{n} \times 100$$

Where DR = discount rate

F = face value

P = purchase (cost) price

D = number of days in a year (365)

n = maturity period of investment

Yield Rate

The yield rate is the rate of return on the cost of Treasury bills invested. It is obtained as the discount amount divided by the cost of the Treasury bill expressed as a percentage annualized on a 365-day year.

$$YR = \left(\frac{F - P}{P} \right) \times \frac{D}{n} \times 100$$

Where YR = yield rate.

F = face value

P = purchase (cost) price

D = number of days in a year (365)

n = maturity period of investment

SECONDARY MARKET FORMULAES FOR TREASURY BILLS

1. Simple discount rate

$$Dr = \frac{100 - P}{100} \times \frac{365}{D}$$

Where P = Price / cost of the Treasury bill
D = Days in the period of investment

2. Yield rates

$$S_r = \frac{100 - P}{P} \times \frac{365}{D}$$

3. Converting Yield rate into discount rate

$$Dr = \frac{S_r}{1 + S_r t}$$

Where S is the yield rate
T is time in years

4. Converting Discount rate into yield rate

$$S_r = \frac{Dr}{1 - Drt}$$

5. Effective interest rate of Treasury bill – An effective rate is a compounded and annualized rate

$$E_r = \left(1 + \frac{S_r}{365/d}\right)^{365/d} - 1$$

Where S = nominal yield rate
D = number of days to maturity

6. Price of Treasury bills from the discount rate

$$P = F - (rt)$$

7. Price of Treasury bill from the nominal yield rate

$$P = \frac{F}{(1 + S_r t)}$$

8. Price of Treasury bill from effective yield rate

$$P = \frac{F}{(1+E_r)^t}$$

9. Holding period yield rate

$$HPY = \left(\frac{P_{sell}}{P_{Buy}} - 1 \right) \Big/ t$$

Where t = number of days bill has been running expressed as years

10. Selling price of Treasury bill calculation.

$$P_{sell} = \frac{Fv}{1+S_r t}$$

Where: S = current yield rate
t = number of days remaining to maturity expressed in years

Bond

The price of a bond is the present value of cash flows (coupon interests & principal amount) to be paid during the life of the bonds.

$$BP = \frac{coupon}{(1+r)} + \frac{coupon}{(1+r)^2} + ... + \frac{coupon + principal}{(1+r)^n}$$

Where BP = Bond price
r = Discount rate
n = total number of coupon interest payment

Secondary market pricing of government bonds

In order to price a bond in the secondary market that is purchased and settled between coupon dates, three questions must be asked and answered.

- **How many days are there until the next coupon payment?**
- **How should we determine the present value of cash flows received over the fractional periods?**
- **How much must the buyer compensate the seller for the coupon interest earned by the seller for the fraction of the period that the bond was held?**

To price the bond in the secondary market the following should be computed:

1. **Determine the number of days in the coupon period**
2. **Compute the following ratio**

$$w = \frac{number\,of\,days\,between\,settlemen\,t\,and\,next\,coupon\,payment}{Number\,of\,day\,s\,in\,the\,coupon\,period}$$

3. **For a bond with n coupon payments remaining to maturity, the price is**

$$p = \frac{c}{(1+i)^{w}} + \frac{c}{(1+i)^{1+w}} + ... + \frac{c}{(1+i)^{n-1+w}} + \frac{M}{(1+i)^{n-1+w}}$$

Where
p = Price
c = Semiannual coupon payment
M = Maturity value
n = Number of coupon payments
i = periodic interest rate (required yield divided by 2)

4. Accrued interest

The formula for accrued interest calculation for a bond transaction is as follows:

Cum-interest period

$$AI = \frac{CPN}{2} \times \frac{DCS}{E}$$

Where:
AI = accrued interest per K100 face value
CPN = Coupon rate (as a percentage)
DCS = days between beginning of current coupon period and settlement date
E = number of days in the coupon period where settlement occurs

Example

The accrued interest per K100 face value for a transaction involving 20 percent Zambian Government bond due 15th November 2004 for value 30 June 2003 is calculated as follows:

$$AI = \frac{20}{2} \times \frac{46}{183}$$

AI = K2.51

Price yield
The formulae for price and yield calculations are as follows:

- For semi-annual coupon with 6 months or less to maturity:

$$P = \left[\frac{100\left(RV + \frac{CPN}{2} \right)}{100 + \left(\frac{DSM}{E} \times \frac{Y}{2} \right)} \right] - \left(\frac{CPN}{2} \times \frac{DCS}{E} \right)$$

- For semi annual coupon with more than 6 months to maturity:

$$P = \left[\frac{RV}{\left(1 + \frac{Y}{200} \right)^{N-1+\frac{DCS}{E}}} \right] + \left[\sum_{K=1}^{N} \frac{\frac{CPN}{2}}{\left(1 + \frac{Y}{200} \right)^{K-1+\frac{DSC}{E}}} \right] - AI$$

Where:

AI =Accrued interest per K100 face value
DSM = days between settlement date and maturity date
DCS = days between beginning of current coupon period and settlement date
E = number of days in coupon period where settlement occurs
DSC = E - DCS = days from settlement date to next 6 months coupon date
N = number of semi annual coupons payable between settlement date and maturity date
CPN = annual coupon rate
Y = annual yield
P = Kwacha price per K100 face value
RV = Redemption value

Irregular first interest period for new issue

First interest (coupon) payment

$$FC = \frac{CPN}{2} \times \frac{DIF}{E}$$

Where:
FC = amount of first interest payment per K100 face value
CPN = annual coupon rate

DIF = days between issue date and first coupon date
E = number of days in the assumed normal first coupon period

Case 1 First interest period less that 6 months

TO CONVERT WEIGHTED AVERAGE YIELD RATES INTO A TREASURY BILLS PRICE

1. **To convert a Treasury bill weighted average yield rate into a price use the following formula:**

$$Tbillprice = \frac{Facevalue}{1+\left[\frac{WAYR \times T}{365}\right]}$$

Where:
Face Value = K100
WAYR = Weighted average yield rate on the latest tender.
T= Number of days to Maturity

For Example K1, 000, 000.00 for 28 Days at a weighted average yield rate of 41.5844 % would give the price as K96.9086.

Funds to collect from the customer would be as follows:

Cost of Treasury bill	= K969, 086.00
Handling fees	= 618.28
Total	= K969, 704.28

2. **To convert a government bond weighted average yield rate into a bond price**

$$Bondprice = \frac{\frac{CPN}{2} \times 100}{\left(1+\frac{WAYR}{2}\right)^{1}} + \frac{\left(\frac{CPN}{2} \times 100\right)+100}{\left(1+\frac{WAYR}{2}\right)^{2}}$$

Where:
CPN = Coupon rate
WAYR= Weighted average yield rate

For Example K1, 000, 000.00 for 12 Months coupon rate of 30%, at a weighted average yield rate of 54.0485 % would give the price as K83.0821

Funds to collect from the customer would be as follows:

Cost of the bond	= K830, 821.00
Handling fees	= 6, 000.00
Total	= K836, 821.00