

# DEBT MARKET

## Mark to Market Valuation Rules

2014

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## 1. Executive Summary

The Johannesburg Stock Exchange (JSE) provides mark-to-market (MTM) valuations for all products listed on the exchange on a daily basis. This document is a continuation of the previous Market to Market valuation rules document published in 2006 and includes numerous changes and enhancements. Some of the main changes are highlighted below:

Given that the majority of listed instruments (especially corporate) rarely trade, pre and post trade information is infrequent. As a result the eligible trade data pool has been increased with the new MTM methodology.

Any trade that is reported through the exchange, within certain parameters, is used to revalue spreads. The required parameters are as follows:

- All spot trades will be taken into consideration for the day in question. I.e. all possible settlement conventions (T+0, T+1, T+2 and T+3). The JSE does not consider REPOs, FOV<sup>1</sup>, SD<sup>2</sup> and OX<sup>3</sup> trades.
- Internal book-overs are considered as traded data
- Only trades in nominal value equal to or more than ZAR5 million will be considered. Trades below ZAR 5 million are not considered to be market moving trades.

The MTM level will be adjusted to the level of the last trade should it meet the criterion mentioned above.

Given that there is currently no real centralized price discovery venue for corporate debt, the JSE has endeavoured to introduce more transparency in the daily MTM valuations files disseminated to the market. The changes will allow investors sight into whether the pricing of a particular instrument is potentially “stale” by including when the instrument was last traded and when it was last revalued. The new added fields are as follows:

MTM Change	MTM Process Methodology	Last Trade Date	Last MTM Change Date	Yield/Price Indicator	Index Ratio
Bid / Offer	PD Rates	30/06/2013	10/07/2013	Yield	
Trade	Market Maker	05/06/2013	05/06/2013	Price	2.0462
Issuer (Eskom)	Spread over companion	03/04/2013	10/07/2013	Price	

- MTM Change: Why the MTM changed
- MTM Method: The methodology/process that the exchange used to value the bond for MTM purposes

<sup>1</sup> FOV – A free of value trade is a trade whereby the script is settled electronically through the CD, however the cash is settled off shore

<sup>2</sup> SD – A structured deal is a trade whereby the normal bond pricing formula does not apply as the bond is traded away from market.

<sup>3</sup> OX – An option exercise trade represents a trade that results from an option that has been exercised. These trades are deliberately flagged on the system as the strike is usually out of the daily trading range.

- Last Trade Date: The last date the specific instrument traded
- Last MTM Change Date: The last date the MTM for a particular instrument changed
- Yield/Price Indicator: Indicates whether or not the instrument is traded as price or yield
- Index Ratio: Provide the multiplicative factor used to calculate inflation linked bond prices

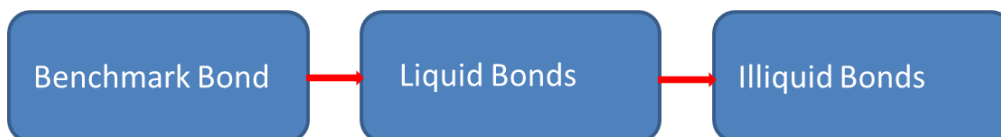
The MTM valuation rules is ever changing and evolving. The JSE will continue to work with the market on additional methods to improve the valuation process. Concepts such as an electronic trading platform for corporate debt as well as the possibility of a weekly auction for these corporate issues are also addressed in the document.

## 2. Introduction

The Johannesburg Stock Exchange (JSE) provides mark-to-market (MTM) valuations for all products listed on the exchange on a daily basis. This document outlines the business rules that apply in determining the daily MTM valuations for interest rate instruments.

The flow of the MTM process is as follows. First the benchmark bond yield is determined. This forms the basis of the daily MTM valuations. Next, the MTM levels of the liquid government issues are determined (liquid bonds). This is done in conjunction with the primary dealers and the closing levels for these bonds are derived by applying a spread against the benchmark bond, as well as using spreads between the other liquid issues. Finally the corporate issues (illiquid bonds) are priced off the spread valuations of the liquid bonds given that they are linked to a liquid government issue. This process is depicted below.

Bond MTM Flow



## 3. Rules for the determination of the benchmark bond and MTM

The benchmark bond forms the basis of the daily MTM valuation. The benchmark bond is determined based on the criterion of which is the most liquid bond in the South African debt market. It is important to understand that the determination of the benchmark is not a specific event. It is rather a function of the market's recognition of a bond becoming the most traded bond in the market. This normally occurs on suggestion. Once a suggestion has been made to the exchange, all primary dealers will be polled and need to be in unanimous consent before the exchange changes the benchmark bond. The current benchmark is considered to be the R186.

The first step in performing the MTM daily valuation is to ascertain a closing level for the benchmark bond, which is done at 16h30. This forms the basis of the MTM process. The exchange establishes a closing level for the R186 (benchmark bond) by evaluating all available "live" prices on the vendor pages<sup>4</sup>, taken from the Reuters pages of the inter-dealer brokers (IDB's).

The methodology adhered to is as follows:

<sup>4</sup> The only vendor page currently used is Reuters.

- The best bid (the bid with the lowest yield) and the best offer (the offer with the highest yield) in the market are noted;
- The level at which the last trade executed is then used as a starting point in determining the closing level;
- If the last trade falls within the best bid / offer spread then the last trade is deemed to be the closing level of the R186. If the last trade does not fall within the bid / offer spread then the level is deemed to be either at the best bid or offer depending on where the last trade was executed;
- If the bid on Reuters is better than the last trade, for example, if the last trade is executed at 8.16% and a new bid appears on the system at 8.14% (i.e. anything less than 8.16%), the R186 is closed at the bid level;
- If an offer exists on Reuters which is better than the last trade, for example, if the last trade is executed at 8.16% and a new offer appears on the system at 8.175% (i.e. anything greater than 8.16%) then the R186 is closed at the offer level.
- If a trade has not occurred in the R186, then the previous days MTM will be used as the starting point and the same process is applied.

#### 4. MTM Valuation Rules for Liquid Bonds

The liquid bonds are those bonds for which the primary dealers make a market in as per the national treasury/primary dealer agreements. These bonds currently consist of the most liquid government issues (namely the R157 R201, R203, R204, R206, R207, R208, R209, R213, R214 R2023, R2037, and R2048). The closing MTM levels of these bonds are determined with the assistance of the primary dealers via the end of day “Call-Down Process”

The Call-Down Process works as follows:

As soon as the exchange determines the closing level of the R186 benchmark bond, the MTM level is supplied to all 7 Primary Dealer Banks (currently: Citibank, Standard Bank, ABSA, RMB, Investec, Deutsche Bank and Nedbank). These banks in turn use this level to determine the closing levels of the liquid bonds (the bonds indicated above). The primary dealers derive the closing levels for the liquid bonds by applying a spread against the R186, as well as using spreads between the other liquid issues.

In order to make the resultant data as accurate as possible, outliers are removed (the highest and lowest level) for each liquid bond and the remaining levels are then averaged to determine the MTM value of the relevant issues. This level is then rounded to the nearest half basis point. The rules to determine the number of outliers to be removed from the data set is as follows:

- If there are 7 or more contributors, 4 outliers will be removed (the two highest and lowest contributions). The remaining data is then averaged.

- If there are between 5 and 7 contributors, 2 outliers will be removed (the highest and lowest contributions). The remaining data is then averaged.
- If there are 4 contributors or less, no outliers will be removed. All the data is averaged.
- If a member contributes the spreads for the liquid bonds outside of the call down process, the JSE will still include the data in the averaging process.

## 5. MTM Valuation Rules for Bonds with Official Market Makers

If in agreement with the exchange, an entity is deemed to be market making in a particular bond, the below market making rules will apply:

- On all trading days, a market maker needs to make tradable rates/prices available to market participants and the exchange.
- Intermittent or non-tradable rates/ prices will not be deemed acceptable. In such instances the exchange will not use the “market makers” prices for MTM purposes. The entity will be deemed switched off for MTM purposes.
  - At such a time that a market maker has tradable prices available for 5 consecutive trading days (post the exchange switching the entity off for MTM), it will again be used to determine MTM levels.

Certain organisations act as market makers in their own issues. These organisations provide to the exchange, daily closing levels for their issues. These levels are then recorded as the instruments MTM valuations.

All market making rules will apply to these issuers as well. As such if the prices are not provided on a daily basis and do not confirm to the market making rules, the issuers will be deemed switched off and not considered a market maker. The exchange would then not use the closing levels provided by these issuers for their own issues.

## 6. MTM Valuation Rules for Illiquid Bonds

An illiquid bond is a bond that is scarcely traded. Due to the illiquidity of many bonds it is essential to devise a methodology to account for the limited information available and provide the market with accurate valuations.

The methodology for valuating illiquid bonds is detailed below:

- Upon issue, the bond is linked to a liquid government issue (a companion bond). The companion is chosen so as to best fit the characteristics of the issue, with time to maturity being the most important factor. The spread is determined after liaising with the issuer as well as the originator/debt sponsor for that particular

security. This spread is then verified by taking the yield at issue and comparing it to the companion bond's yield at the time of issue.

- The exchange receives bid / offer spread information from market participants and interdealer broker pages (Reuter's pages). This information is used to revalue any existing spreads. The spread is adjusted if there is a better bid / offer in the market.
  - For example, if a bid appears which is better than the current MTM level, say if the current MTM is at a 25 point spread above its companion and a new bid appears on the system at 24 points above the companion (i.e. anything less than 25 points), the market is deemed to have moved. Likewise if an offer appears which is better than the current MTM level, say if the current MTM level is 27 points above its companion and a new offer appears on the system at 28 points above its companion (i.e. anything greater than 27 points), the market is deemed to have moved.
  - If the current MTM level falls within the best bid / offer, the MTM level will remain unchanged.
    - Only bids / offers in nominal value equal to or more than ZAR 5 million will be considered.
  - In the event that there are no trades reported in an instrument on a particular day, the previous day's close (or last trade) is used as a starting point.

#### Electronic Trading Platform

The JSE is in the process of investigating the possibility of introducing an electronic trading platform (ETP) for corporate bonds. The live on screen pricing information will mean the Reuters pricing will no longer be eligible to determine MTM levels. Hence the exchange would use the bid / offer spread information from market participants as obtained off the electronic trading platform. This information will then be used to revalue any existing spreads. The same MTM valuation process would still apply with the only difference being the source of the data (i.e. the spread is adjusted if there is a better bid / offer in the market as displayed on the ETP).

- For bid / offers to be applicable for use in the MTM valuations they need to remain on screen until 16h00. In addition, bid / offers also need to be up on screen at least 1 hour prior to the start of the end of day



valuations. Given that the JSE commences with the MTM process at 16h00, all bid / offers will need to be up by 15h00 (at a minimum) in order to be used in determining the MTM levels for the debt instruments. If the bid / offers are only up post 15h00, they are however still tradable. If a trade does takes places on one of the bid / offers, then that trade will still be applicable for determining the MTM level.

- Any trade that is reported through the exchange, within certain parameters, is also used to revalue spreads. Trades are analysed using the trade capture system. The procedure is carried out daily at 16h00. The required parameters are as follows:
  - All spot trades will be taken into consideration for the day in question. I.e. all possible settlement conventions (T+0, T+1, T+2 and T+3). The JSE does not consider REPOs, FOV<sup>5</sup>, SD<sup>6</sup> and OX<sup>7</sup> trades.
  - Internal book-overs are considered as traded data
  - Only trades in nominal value equal to or more than ZAR5 million will be considered. Trades below ZAR 5 million are not considered to be market moving trades.
  - The level will be adjusted to the level of the last trade should it meet the criterion mentioned above.
- If the last trade falls within the best bid / offer spread then the last trade is deemed to be the end of day MTM level. If the last trade does not fall within the bid / offer spread then the end of day level is deemed to be either at the best bid or offer depending on where the last trade was executed.
- If there are no bids / offers available, but there is traded data, the last traded level will be used as the instruments MTM level. If there are no bids / offers or traded data available for a particular day, the bonds previous days MTM valuation will be used at the instruments MTM level.

#### Auction Process

The JSE is in the process of investigating the possibility of introducing a daily auction process applicable for corporate bond issues. These levels would also be applicable to determine the MTM levels for corporate debt instruments. If an instrument is matched during the auction process, it will be regarded as any other trade and hence all applicable rules pertaining to trades for MTM purposes will apply.

<sup>5</sup> FOV – A free of value trade is a trade whereby the script is settled electronically through the CD, however the cash is settled off shore

<sup>6</sup> SD – A structured deal is a trade whereby the normal bond pricing formula does not apply as the bond is traded away form market.

<sup>7</sup> OX – An option exercise trade represents a trade that results from an option that has been exercised. These trades are deliberately flagged on the system as the strike is usually out of the daily trading range.

## 6.1. Adjusting the Companion Bond Yield

On occasion the companion bond for a corporate instrument is required to change. This could be due to the companion bond nearing expiry (ceases to exist) or as a request from the market. These requests/adjustments are communicated to all market participants prior to any change.

The process for adjusting the companion bond is as follows.

The yield of the corporate bond is held constant when changing the companion bond. As indicated in table 1 below, the yield for the ABN01 is 9.00% with the R157 issued as the companion bond. However if the companion bond is changed to the R203 (as shown in table 2) and the spread remains constant (100 bp), ABN01's yield would shift from a yield of 9.00% to 8.20%. Hence, in order to ensure that the MTM yield of ABN01 is consistent, the exchange would back solve for the required spread. In the example below (table 2) the spread would hence be adjusted from 100bp to 180bp and as a result the yield of ABN01 would remain constant for MTM purposes.

Bond	Yield
Companion Bond (R157)	8.00%
Spread	100(bp)
Corporate Bond ABN01	9.00%

Table 1

Bond	Yield
Companion Bond (R203)	7.20%
Spread	180(bp)
Corporate Bond (ABN01)	9.00%

Table 2

## 7. MTM Rules for Commercial Paper (CP)

Commercial paper is a short term debt instrument issued by corporate entities. There are two types of commercial paper in issue and these are priced linearly to maturity. The Methodology is as follows:

- Zero coupon commercial paper. These bonds are issued at a discount to par and are priced linearly to par at maturity.
- Coupon paying commercial paper. These bonds are issued at par, and are priced to a premium at maturity. The exact premium depends on the coupon rate determined at issuance.

## 8. The MTM Valuation Rules for Inflation Linked Bonds

Inflation-linked bonds (ILBI's) are issued such that both their coupons and principal are linked to the South African Consumer Price Index (CPI) as distributed by Statistics South Africa. Please note that it is the headline CPI that is used (i.e. the Consumer Price Index for the historical metropolitan areas –all items). ILBs are valued using trades as well as live prices available in the market (obtained from IDB Reuters screens).

The procedure is as follows:

- At 16h00 trades in ILBs are analysed using the JSE trade capture system. The required parameters are as follows:
  - All standard spot trades will be taken into consideration for the day in question. I.e. all possible settlement conventions (T+0, T+1, T+2 and T+3). The JSE does not consider REPOs, FOV, SD and OX trades.
  - Internal book-overs are considered as traded data when evaluating spreads.
  - Only trades in nominal value equal to or more than ZAR 5 million will be considered. Trades below ZAR 5 million are not considered to be market moving trades.
  - The level will be adjusted to the level of the last trade should it meet the criterion mentioned above.
- At 16h30 the best bid (the bid with the lowest yield) and the best offer (the offer with the highest yield) in the market are noted. The level at which the last trade executed is then used as a starting point in determining the closing level. If the last trade falls within the best bid / offer spread then the last trade is deemed to be the closing level. If the last trade does not fall within the bid / offer spread then the level is deemed to be either at the bid or offer depending on where the last trade was executed.
  - For example, if the bid on Reuters is better than the last trade, say if the last trade is executed at 2.8% and a new bid appears on the system at 2.78% (i.e. anything less than 2.8%), the market is

closed at the bid level. If an offer exists on Reuters which is better than the last trade, for example, if the last trade is at 2.8% and a new offer appears on the system at 2.82% (i.e. anything greater than 2.8%) then the market is closed at the offer level.

- In the event that there are no trades reported in an instrument on a particular day, the previous day's MTM level is used as a starting point (or last trade).
- Inflation linked bonds are eligible for auction once a week (occurs every Friday). If an instrument is matched during the auction process, it will be regarded as any other trade and hence all applicable rules pertaining to trades for MTM purposes will apply.
- If there are no bids / offers or traded data available for a particular day, the bonds previous days MTM valuation will be used at the instruments MTM level.

## 9. MTM Valuation Rules for Price Traded Instruments

A Floating Rate Note (FRN) is a security that resets coupons against a floating benchmark rate (usually on a quarterly basis). Although a floater's coupon can depend on a wide array of economic variables (FOREX rates, commodities etc.), a floater's coupon payments usually depend on the level of money market interest rates (short term interest rates e.g. JIBAR, T-Bills, Prime etc.). This means that at any period, the only cash flows that are known are those that are paid at the next interest date. The instrument is generally issued at a margin/spread above the benchmark rate termed the initial spread (IS). For example, a FRN that bears interest at JIBAR + 50bp would have an IS of 50bp. Over the life of the security this margin may or may not change based on credit characteristics of the issuer or the industry, prevailing interest rates, etc. as it nears maturity. This is referred to as the trading spread.

The MTM methodology adhered to is as follows.

- Any applicable trade that is reported through the exchange, within certain parameters, is used to revalue spreads. Trades are analysed using the trade capture system. The procedure is carried out daily at 16h30.
  - For FRN trades to be applicable for MTM valuation purposes, the trade will need to be booked as both a price and as a spread.
  - Until such time that the spread booking functionality is available, the exchange will obtain the traded spread via an end of day "Call-Down Process"

The Call-Down Process works as follows:

At 16h30 the exchange determines whether a FRN instrument has traded. If this is the case, the dealer that traded the instrument is called and the spread level is supplied to the exchange.

- With no applicable traded data, FRN's are priced using various inputs such as the Johannesburg Inter-Bank Agreed Rate (JIBAR) which is calculated daily at 11h00. FRN's also use inputs from all points along the swap and FRA curves. These data points are provided to the exchange by 5 market makers. The market makers are Citibank, ABSA, RMB, Investec, Deutsche Bank and Nedbank.
  - In order to make the resultant data as accurate as possible, two outliers are removed (the highest and lowest level) for each point along the swap and FRA curve and the remaining 3 levels are then averaged to determine the level of the relevant points along the curve. This level is then rounded to the nearest three decimals.
  - A linear interpolation of the swap (and FRA) curve is then applied. This is then priced per R100 nominal. It must be noted that for price traded instruments, the YTM data as published in the JSE MTM files is the price and not the yield.

With privately placed instruments, the exchange will rely on the MTM levels provided externally by the issuer or lead underwriter/ debt originator. Given that these instruments are not publically held and that the pricing is agreed upon between the two counterparties, the exchange will use these valuations for MTM purposes.

- The exact FRN pricing methodology is outlined in the JSE Floating Rate Note Pricing Specification (available for review from the Johannesburg Stock Exchange).

<https://www.jse.co.za/content/JSEPrimingItems/pricing%20frn%27s%20specification%20final.pdf>

There are other bonds that have similar features to FRN's. These bonds either pay quarterly coupons or they are amortizing which means that both principal and interest is paid on the coupon dates as one payment. While such bonds are not exactly like FRN's, their special features require adaptations to the FRN methodologies for valuation purposes. These valuations are either calculated using the adapted FRN methodology or they are made available to the exchange by the issuer or lead underwriter \ debt originator. Thus currently some FRN's and other special feature bonds similar in nature to FRN's are priced either by the exchange or externally by lead underwriters or the debt originators. The pricing formulas that are used for the MTM valuations of the various price-traded bonds are available on request.

## 10. MTM Enhancements

### 10.1. MTM Valuation Transparency

As mentioned in this document, the exchange applies different methodologies to determine the end of day MTM levels for the various debt instruments. Some bonds also very rarely trade, and as such it is important for market participants to have more information such as, when last a bond traded, what method was used to determine the MTM level, and if an issuer makes a market in its own bond, which are these bonds. Hence, the exchange will improve overall transparency in the end of day MTM files by adding the new fields to the current data set.

Current MTM file:

Bond Code	ISIN Code	Maturity	Coupon	Companion Bond	MTM	All in price	Clean Price	Accrued Interest
R201	ZAG000019878	21-Dec-14	8.75		5.445	105.64098	104.17865	1.46233
E2013	ZAG000010547	15-Sep-15	13.5	R157	6.170	119.84973	113.96891	5.88082

Year High Yield	Year Low Yield	Return (YTD)	Duration	Modified Duration	Delta	Rand per Basis Point	Convexity	Spread (bp)
6.035	4.86	0.08	1.2728541	1.239119118	-1.30901761	130.90176124	2.1830224	
6.515	4.95	0.16	1.7957602	1.742018891	-2.08780496	208.78049618	4.1979081	

New added fields:

MTM Change	MTM Process Methodology	Last Trade Date	Last MTM Change Date	Yield/Price Indicator	Index Ratio	Base CPI	Reference CPI
Bid / Offer	Liquid Bond	30/06/2013	10/07/2013	Yield			
Trade	Price Traded Instrument	05/06/2013	05/06/2013	Price	2.0462		
Issuer (Eskom)	Official Market Maker	03/04/2013	10/07/2013	Yield			

- MTM Change: Why the MTM changed
- MTM Method: The methodology/process that the exchange used to value the bond for MTM purposes
- Last Trade Date: The last date the specific instrument traded
- Last MTM Change Date: The last date the MTM for a particular instrument changed
- Yield/Price Indicator: Indicates whether or not the instrument is traded as price or yield
- Index Ratio: Provide the multiplicative factor used to calculate inflation linked bond prices
- Base CPI: Indicates the CPI value in relation to the settlement date on which the issue took place.
- Reference CPI: Indicates the CPI value in relation to the settlement date on which the trade took place.

## 11. Trading Halt – Suspension

In the event of a suspension or trading halt of any interest rate instrument, no MTM valuation will be made. Due to the extreme uncertainty of the outcome of events such as liquidation proceedings, the recovery value for instrument-holders of a suspended bond is highly uncertain. The JSE has deemed that it is appropriate for the bond to be valued at zero in the JSE MTM process.

## 12. Special Case Reports

If in the event that a MTM level for any fixed income instrument is determined by means outside the scope of this document, the exchange will submit a special case MTM report highlighting all aspects of the valuation.

## 13. Bond Futures Spot level Determination – Vanilla Government Bonds

The process to determine the vanilla government bond closing levels at 12:00, on Bond Future Close-Out dates, is similar to the process that occurs for the daily MTM valuation.

The first step in performing the closing spot levels valuation for Bond Future Close-Out is to ascertain a closing level for the benchmark bond, which is done at 12h00. This forms the basis of the spot level determination for Bond Future Close-Out. The exchange establishes a closing level for the R186 (benchmark bond) by evaluating all available “live” prices on the vendor pages, taken from the Reuters pages of the inter-dealer brokers (IDB’s). This screen shot is taken at 12h00.

The other government bond levels required for the Bond Futures Close-Out are determined as per the liquid bond methodology. The spot level for these bonds is determined with the assistance of the primary dealers via the midday “Call-Down Process” which commences at 12h05.

The Call-Down Process works as follows:

As soon as the exchange determines the level of the R186 benchmark bond, the level is supplied to all 7 Primary Dealer Banks (currently: Citibank, Standard Bank, ABSA, RMB, Investec, Deutsche Bank and Nedbank). These banks in turn use this level to determine the closing levels all the bonds required for Bond Futures Close-Out. The primary dealers derive the closing levels for these bonds by applying a spread against the R186, as well as using spreads between the other issues.

In order to make the resultant data as accurate as possible, outliers are removed (the highest and lowest level) for each liquid bond and the remaining levels are then averaged to determine the MTM value of the relevant issues. This level is then rounded to the nearest half basis point. The rules to determine the number of outliers to be removed from the data set is as follows:

- If there are 7 or more contributors, 4 outliers will be removed (the two highest and lowest contributions). The remaining data is then averaged.
- If there are between 5 and 7 contributors, 2 outliers will be removed (the highest and lowest contributions). The remaining data is then averaged.
- If there are 4 contributors or less, no outliers will be removed. All the data is averaged.
- If a member contributes the spreads for the liquid bonds outside of the call down process, the JSE will still include the data in the averaging process.

#### 14. Bond Futures Spot level Determination – Inflation Linked Government Bonds

The process to determine the inflation government bond closing levels at 12:00, on Bond Future Close-Out dates, is similar to the process used for the vanilla government bonds on bond futures closeout.

The inflation linked government bond levels required for the Bond Futures Close-Out are determined as per the liquid bond methodology. The spot level for these bonds is determined with the assistance of the primary dealers via the midday “Call-Down Process” which commences at 12h05.

The Call-Down Process works as follows:

Only the primary dealers who participate and trade inflation linked bonds are polled. This currently amounts to 5 primary dealers (Standard Bank, ABSA, RMB, Investec, and Nedbank). These banks in turn provide the outright closing levels for all the inflation linked government bonds required for Bond Futures Close-Out.

In order to make the resultant data as accurate as possible, outliers are removed (the highest and lowest level) for each liquid bond and the remaining levels are then averaged to determine the MTM value of the relevant issues. This level is then rounded to the nearest half basis point. The rules to determine the number of outliers to be removed from the data set is as follows:

- If there are 7 or more contributors, 4 outliers will be removed (the two highest and lowest contributions). The remaining data is then averaged.
- If there are between 5 and 7 contributors, 2 outliers will be removed (the highest and lowest contributions). The remaining data is then averaged.
- If there are 4 contributors or less, no outliers will be removed. All the data is averaged.



- If a member contributes the spreads for the liquid bonds outside of the call down process, the JSE will still include the data in the averaging process.

## 15. Bond Futures Spot level Determination – Corporate Bonds

Currently there are no bond futures on any of the illiquid bonds and hence only the above Government and Inflation linked process is used. However, if bond futures were listed on an illiquid bond (corporate) the process is slightly different as indicated below.

Given that upon issue a corporate bond is linked to a companion bond (liquid bond), the companion bond close out level is determined via the call down process as indicated above. The second step is to apply the illiquid bond valuation methodology as defined earlier and presented again below. The most recent spread over and above the companion bond is applied to the corporate bond in order to determine the spot determination level. The spread level applied would be taken from the most recent trade data as follows:

- At 12h00 any trade that is reported through the exchange, within certain parameters, is used. Trades are analysed using the trade capture system. The required parameters are as follows:
  - All spot trades will be taken into consideration for the day in question. I.e. all possible settlement conventions (T+0, T+1, T+2 and T+3). The JSE does not consider REPOs, FOV, SD and OX trades.
  - Internal book-overs are considered as traded data
  - Only trades in nominal value equal to or more than ZAR5 million will be considered. Trades below ZAR 5 million are not considered to be market moving trades.
  - The level will be adjusted to the level of the last trade should it meet the criterion mentioned above.
- If there is no trade information at 12h00, the previous night's MTM spread will be applied to the companion bond so as to determine the close out yield.

## 16. Bond Index Reconstitution and MTM Close

On bond futures close out, the quarterly reconstitution of the ALBI also takes place. The ALBI is the composite index containing the top 20 vanilla bonds ranked dually by liquidity and market capitalisation (please refer to the below link for the complete index calculation methodology as well as the rules which are applied ever quarter).

<https://www.jse.co.za/content/JSEIndexClassificationandCodesItems/Fixed%20Income%20Ground%20Rules.pdf>

The process used to determine the 12h00 reconstitution spot levels is the same as is defined above (bond futures spot level determination). If the bond is a government bond (vanilla or inflation) the call down process is used. If the bond is a corporate bond, or a bond with an official market maker, the illiquid bond methodology and official market maker methodology is used. For the reconstitution spot determination level, the process takes place at 12h00 as indicated earlier.

## 17. MTM Contact Details

Should you have any queries regarding the MTM valuation rules or would like to have access to any pricing formulas, please contact the following JSE email address to ensure we can keep a record of all MTM queries.

- Interest rates MTM valuation team  
Email: [lrdata@jse.co.za](mailto:lrdata@jse.co.za)