

# OPTIONS ON BOND FUTURES

## Contract Specification

January 2016

### **What is an Option on a Bond Future and how does it work?**

A Bond option is, very simply, an instrument that conveys to its holder the right, but not the obligation, to buy or sell a bond future at a fixed price. The writer/seller of the option grants this right and receives a premium from the buyer for undertaking this obligation.

Most Bond Future contracts listed on the JSE (Interest Rate and Currency Derivative trading platform) are eligible as the underlyings of European put and call options, which means they may only be exercised at expiry. The JSE currently does make options on corporate bonds and inflation linked bond futures available.

The price paid for an option is the premium. It is the only variable feature of an option contract and depends on market conditions such as interest rates, volatility and time remaining until expiration. All other option contract terms are predetermined, including the contract months and the strike prices (also referred to as the exercise price).

Bond options are “fully margined”, meaning that the premium does not change hands on purchase or sale, but is realised through the mark-to-market process over the life of the option. There are daily variation margin calls for both buyers and sellers.

Valuations for margining purposes are performed using the JSE’s Spot Detailed MTM daily file and standard interest rate and options theory.

Options are valued for mark-to-market purposes using the Modified Black formula, with the mark-to-market value of their underlying futures contract and their market volatility (with skew adjustment) as inputs.

The volatility skew is expressed as an additive spread at various percentages of moneyness (the percent by which the strike price of an option is above or below the market price of the underlying) and linearly interpolated at other strikes. The skew is determined by polling market participants and the latest ‘Volatility Skew’ can be found at this link:

[https://www.jse.co.za/downloadablefiles?RequestNode=/YieldX/IRD\\_Vol\\_Skews](https://www.jse.co.za/downloadablefiles?RequestNode=/YieldX/IRD_Vol_Skews)

Options on Bond Futures are physically settled due to the fact that the Bond Futures themselves are physically settled. They are quoted and traded in terms of yield.

### **Close-Out Process**

The process to determine the vanilla government bond closing levels at noon 12h00 SA time on the first business Thursday of February, May, August and December is similar to the process that occurs for the daily MTM spot bond valuations. The process is outlined in market notice *Y1398B MTM Rules and valuations*



2014 (Page 15 #13. Bond Futures Spot level determination – Government Bonds). These levels are used to determine the expiry levels on expiry dates.

Once the spot expiry levels have been determined they are published on both Bloomberg and Reuters, both data vendor pages are called <BESA>. The close-out rates are published on Bloomberg on the <BESA> page and found under 8) End of Day MTM Rates menu.

On expiry, options that are in the money are automatically exercised into their futures. Exercise takes place through the exchange. Long options exercised are assigned to shorts, in proportion to their positions in the option, with a randomizing process to avoid odd or fractional lots.

All options are automatically exercised at expiration if they are 0.01 basis points or more **“in-the-money” (ITM)**, i.e. if you bought a **call option** with a strike rate of 8.50 and the close-out spot yield was 8.49 you would be automatically exercised into the Futures contract at a yield of 8.50.

If held to expiration (the first business Thursday of the expiry month) the Option holder of a **call option** will automatically take delivery of the underlying bond if the spot close-out yield is below the strike price. Using the example above, all call options with a strike of 8.50 will all be in the money if the spot close out yield is 8.49 or lower.

Similarly, the option holder of a **put option** will automatically take delivery of the underlying bond if the spot close-out yield is above the option’s strike yield.

Options that are not “in-the-money” will not be settled i.e. all options **At The Money (ATM)** and **Out of the Money (OTM)** will automatically be abandoned. This means that the Option holder will merely lose the premium amount paid over the life of the contract.

### **Delivery Process**

Once the spot level has been determined, the JSE will run the close-out process and establish the physical deliveries. The JSE will advise member firms of the physical deliveries that they; the member and their clients need to book. This physical delivery report will include the principal, the bond, the nominal amount, the rate and the counterparty that the member is required to book against. The physically delivered bonds are booked on a T+3 basis similarly to the spot bond market. The JSE requires that the physical deliveries resulting from the bond futures and options close-out are required to be booked on the day of close-out.

Should a participant (client) be holding an option position that is ITM and they are not a member of the JSE they will receive instruction of the amount of bonds to be bought/sold from their trading member/prime broker/clearing member firm. The JSE does not send out the physical delivery report to any participants

other than member firms. Clients are requested to contact their participating member firm for their list of physical deliveries resulting from option positions.

### Risk (Margin)

All positions in Options, in common with all of the Interest Rate derivative instruments, are included in participants' risk positions, whether transacted on-screen as central order-book trades, or dealt off-screen as report-only trades. All components of risk positions are guaranteed for settlement.

Unlike over-the-counter (OTC) traded options where buyers pay option premium to the sellers at the beginning of the option contract period, JSE options are margined options. This means that both parties (buyer/seller) put up initial margin at the beginning of the contract period. The seller does not receive the full premium, and the buyer does not pay the full premium at inception of the contract. The premium is paid to the seller over the life of the option through the daily process of Mark-to-Market. Margin is due to cover the largest negative value that a position is likely to encounter.

The initial margin requirement for individual bond options varies amongst the different bonds and is set by JSE Clear's Risk Management Committee using the JSE's Portfolio Scanning methodology. The JSE revalues the value of each option daily and credits/debits the options holder's account accordingly (as under the normal futures margining system).

The basis of Portfolio Scanning is that the whole of a participant's portfolio on the exchange is valued ("scanned") at a number of points over a wide range of market moves. The range is selected to cover almost all conceivable market moves within the next day. The lowest of the portfolio values is identified and from this is found the greatest loss which the participant could suffer on the next day. The initial margin, due in cash the next morning, is then set equal to this greatest loss.

### Product Specifications

Name	Options on Bond Futures
Underlyings	All listed Bond Futures contracts *
Expiry dates and time	The expiry date and time of the underlying futures contract. <ul style="list-style-type: none"> <li>• First business Thursday of February, May, August and November at 12h00 SA time</li> </ul>
Types	Calls and puts

Style	European
Strike prices	In same units as underlying futures contract's price /quotation
Codes	Underlying futures code + Expiry month + Strike + Type
Unit of trading and minimum allocation	Each option is on one futures contract
Quotations	Naked options: Rands per option Delta trades: Volatility to 3 decimal places
Minimum quotation movement	Naked options: R1 Delta trades: $\frac{1}{10}$ th point
Mark-to-market	Explicit daily
Valuation	Modified Black Option Formula
Volatility skew	Polled from market makers
Automatic exercise	Options which are 0.01 basis points or more in the money at expiry are automatically exercised into their underlying futures contracts
Margining	Margined according to the <i>Portfolio Scanning Methodology</i>