

## MARKET NOTICE

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**Relates to:**  Equity Market  
 Equity Derivatives  
 Commodity Derivatives  
 Interest Rate and Currency Derivatives  
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**SUBJECT:** INDEX OPTIONS IMPLIED ATM VOLATILITY MARK TO MARKET

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### 1. INTRODUCTION

The current process for marking the implied volatility to market for options on index futures incorporates the use of trade data and the 5 minute window from 17:00 to 17:05 to capture a random snapshot based on anchor strikes for the ALSI contracts per individual expiry. On days when certain expiries are not traded or have no on screen bids and offers for the anchor strikes, a sticky-delta adjustment will be made based on the movements in the underlying futures contract.

The DTOP and DCAP contracts as well as Anyday contracts on the three most liquid index futures contracts (ALSI, DTOP and DCAP) currently follow a linked approach in their mark-to-market (MTM) process.

- The at-the-money (ATM) volatilities for DTOP and DCAP expiries are linked to the corresponding ALSI expiries by applying a constant spread throughout the term structure
  - DTOP currently 1.5% above the ALSI
  - DCAP currently 0.75% above the ALSI
- The ATM volatility for Anyday contracts is equal to the next near standard contract (monthly or quarterly)

While this approach has provided a consistent methodology for relating the ALSI contract to the DTOP and DCAP, the lack of flexibility has not allowed for the accurate capture of the activity in the contracts for the DTOP and DCAP. This has also affected the Anyday contracts whose pricing may be affected by liquidity constraints particular to their individual activity.

### 2. DE-LINKING DTOP, DCAP AND ANYDAY CONTRACTS

Within the ITaC framework, the Valuation Input System (VIS) was developed by the JSE as an in house solution that has been able to better automate the input process for equity derivatives. The Valuations team along with the IT Development team will deploy code to de-link the DTOP, DCAP and Anyday contracts from the ALSI contract. The

methodology going forward will capture trade data on a daily basis and use this for the MTM of all the contracts separately. Again, on days where there is no trade activity for a particular expiry within a particular contract, a sticky delta adjustment will be made to the skew. These changes are in accordance with the consultation conducted by the Valuations team with timelines having been set for various enhancements.

This de-linking of the contracts from the ALSI will significantly reduce the occasional inconsistencies that may be observed by market participants in these contracts. The increase in activity in the DTOP and DCAP contracts relative to the ALSI contract has also necessitated this change to self-determine MTM prices.

In a similar manner to the process already implemented for single stock options, the ATM volatility for the index options will be calculated applying a “**skew adjustment factor**”. Given the moneyness of a trade calculated as,  $Moneyness = \frac{Option\ Strike}{Futures\ Ref}$ , the difference between the volatility at this relative strike and the volatility observed for the ATM strike can be computed using the prevailing skew. This number is then subtracted from the traded implied volatility to obtain an “**implied ATM volatility**”. The example below illustrates this numerically using the DTOP contract:

**Example:**

Futures contract:	DTOP
Expiry:	18 JUN 2020
Futures Ref:	10,700
Call Option Strike:	11,200 (moneyness = 104.7%)
Traded Vol	16.54%
Skew Adjustment Factor:	-0.96%
Implied ATM Vol:	<b>17.50%</b>

A weighted average (weighted by number of contracts) of these “implied ATM volatilities” is then computed and applied as the mark-to-market ATM volatility for that particular expiry.

**3. ELIGIBILITY CRITERIA FOR TRADES**

The JSE circulated a consultation paper regarding the eligibility criteria for trades among other items that were covered in the note. These received good feedback from members and other stakeholder in the Equity Derivatives Market. The Valuations team has also conducted the exercise to further observe the practical implications of the eligibility criteria for trades. The following will be implemented with the changes:

1. Only trades within the moneyness range **95% to 105%** will be considered for this exercise. This band is seen to capture a significant number of trades, enough for the robust functioning of the MTM process.
  - a. The exclusion of other trades beyond this range is due to the differences that can be observed for different market makers skews. This difference is seen to be fairly marginal in the tighter band.
2. The lack of liquidity in the option space has necessitated that an initial approach of observing the day’s trades be incorporated for this exercise.
  - a. This use of relative strikes (percentage strikes) and not fixed strikes does allow for the comparison of strikes throughout the trading data.

- b. Limited time periods were observed as alternative (such as 16:00 to 18:00). The inconsistency of booking of trades and thus lack of data for this limited period has necessitated the adoption of an extended time period.
3. A minimum number of 500 contracts per trade will be considered for qualifying trades

The qualifying criteria will be carefully monitored by the Valuations team for applicability. This may change from time to time given differing market conditions. It is the intention that these criteria best capture an accurate MTM process for the ATM volatilities.

#### 4. BOOKING OF TRADES BY MEMBERS

Given the “**price traded**” nature options at the JSE, the trading engine has been configured to require two matching criteria for off book trades namely the **traded premium** and the **underlying futures ref**. It is highly critical that the correct details be captured in order for the trading engine to back out the **correct implied volatility** for the trade. This implied volatility in turn informs the MTM process described above. It is been observed that when members book the incorrect futures reference, the resulting implied volatility tends to be way off the mark.

**NB:** Members are thus encouraged to book these trades correctly in order to facilitate a MTM process that functions consistently.

If a **late trade** is booked the following day for instance, it is important that the futures reference that is captured on the trading front end be adjusted for the change in trade date in order to accurately back out the correct **traded volatility**.

#### 5. IMPLEMENTATION AND PROCESS GOING FORWARD

The JSE will deploy these changes effective for Thursday the **5<sup>th</sup> of December 2019**.

Due to the imperfect nature of the sticky delta adjustment as an ongoing valuations methodology. The Valuations team will also implement other processes for the alignment of ATM implied volatilities that may become stale. This includes:

- observing the calculated realised volatility for a term equal to the tenor of the particular futures contract
- observing trades in other expiries (which may be more active at the time).

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