MARKET NOTICE

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Stock Exchange

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Relates to:	☐ Equity Market ☒ Equity Derivatives ☐ Commodity Derivatives ☐ Interest Rate and Currency Derivatives
Date:	16 August 2019
SUBJECT:	**SINGLE STOCK OPTION IMPLIED VOLATILITY ALIGNMENT**
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1. INTRODUCTION

The listed Single Stock options market is in part characterised by a lack of liquidity and thus, in general, infrequently observed market prices. As a strategy to mitigate the "stale data", the JSE applies a "sticky-delta" adjustment to the prevailing At-the-Money (ATM) volatility which shifts the implied volatility in line with observed moves in the underlying stock and the prevailing volatility skew. The JSE recognises that this is not ideal and may from time to time not depict the prevailing **market view** of forward looking risk.

The stale data can also lead to the term structure of the ATM volatility, per stock, going out of sync from expiry to expiry due to trade data correctly affecting one expiry and not the others. The JSE valuations team seeks to undergo an exercise to align the term structures for single stocks with open interest as a starting point and the rest of the stocks for which implied volatilities are published.

2. CALCULATION OF THE ATM IMPLIED VOLATILITY FROM TRADE DATA

With the development of the Valuation Input System (VIS) within the ITaC framework, the JSE has automated the daily calculation of the ATM single stock implied volatility from trade data. At an individual stock level, the JSE calculates the ATM volatility by applying the moneyness of the traded option, which is calculated as $\boldsymbol{Moneyness} = \frac{\boldsymbol{Option\ Strike}}{\boldsymbol{Futures\ Ref}}$, to calculate a "skew adjustment factor". The skew adjustment factor is subtracted from the traded volatility to back out the ATM implied volatility per trade.

Example:

Stock:	XYZ (Pty) Ltd
Expiry:	19 Dec 2019
Futures Ref:	100

Strike:	105 (moneyness = 105%)
Traded Vol	25%
Skew Adjustment:	-0.81%
Implied ATM Vol:	**25.81%**

A minimum of 100 contracts is used as qualifying criteria on a daily basis for each expiry for trades that can affect the MTM process per listed futures contract. A weighted average (weighted by number of contracts) of the ATM volatilities implied by the skew adjustment factors is then computed and applied as the Mark-to-Market (MTM) implied volatility.

3. BOOKING OF TRADES BY MEMBERS

Given the "price traded" nature options at the exchange, the trading engine has been configured to require two matching criteria for off book trades which comprise the **traded premium** and the **underlying futures ref**. It is very 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 process described in **point 2** above assuming that the minimum 100 contact requirement is satisfied. Incorrectly captured trade details will in turn lead to the incorrect MTM.

If a **late trade** is booked the following day for instance, it is important that the futures reference that is captured be adjusted for the change in trade date and thus impute the correct **traded volatility** to the trade.

4. PROCESS GOING FORWARD

The changes that will be applied to affect the term structure alignment process will, as far as possible, incorporate all market data available to the JSE including trade data for other expiries within the same stock. Some reference to the shape of the ALSI term structure (given that it is the most liquid contract) will be taken into account as a starting point where no additional information exists.

The continued alignment of the term structures for the ATM volatilities will be monitored on an ongoing basis by the Valuations team to ensure the timely reaction to stale data affecting MTMs.

5. IMPLEMENTATION

The JSE will implement this gradually and complete the process by Friday, **23 August 2019**.

The JSE also published a consultation paper on **18 July 2019**. The paper speaks to projected dividends and implied volatilities as inputs to closing equity derivative prices. Please see the following link, [Market Notice 212/2019 Equity Derivatives Valuations Inputs](). Feedback that has been received by the exchange will be used as a key input in informing this and other changes discussed therein to align closing pricing for equity derivatives markets with market activity.

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