
MARKET NOTICE

Johannesburg
Stock Exchange

Tel: +27 11 520 7000
www.jse.co.za

Number: 212/2019
Relates to: Equity Market
 Equity Derivatives
 Commodity Derivatives
 Interest Rate and Currency Derivatives
Date: 18 July 2019

SUBJECT: EQUITY DERIVATIVES VALUATIONS INPUTS

Name and Surname: Mzwandile Riba
Designation: Head - Data Solutions

Introduction

With the implementation of ITaC, the JSE has made positive improvements to daily processes regarding the automation, conventions, standardisation and accuracy of inputs used for the valuation of Equity Derivatives. The Valuation Input System (VIS) is the in house system built by the JSE as part of the ITaC environment that has consolidated valuations operations for both Currency Derivatives and Equity Derivatives in one system. A few examples of the improvements made include:

- Modern workflow automation for daily valuations processes, including schedule and task management, integrated validation functionality and end to end error and exception handling
- End to end process automation for the collection of most price inputs, including international equity spot prices, currency spot and forward rates, ALSI order book snapshots and single stock option traded volatilities, among others
- Standardisation of the structure of the implied volatility surfaces across product lines
- Same source for spot inputs for international stocks and currency crosses
- Same source for offshore swap curves used for derivatives on international stocks
- Applying the same currency fixings for currency derivatives and derivatives with international equity underlying instruments
- Publication of closing prices via the trading engine closing price message prior to market close, giving market participants an earlier view of daily pricing

Following these improvements to the automation and consistency of daily operations, the JSE aims to tackle a number of methodology questions in the Equity Derivatives market that have been raised by market participants. These are typically concerns that the current methodology applied is not the most appropriate approach to determining the closing price of certain listed derivative contracts.

This note explains the key methodology items that have been flagged for review and provides the proposed amendment to the current methodology. All interested market participants are invited to comment on the proposed amendments in the context of their own business models.

Projected Dividends

Current Methodology

The JSE currently uses a base model that calculates a long term (up to five years) dividend growth assumption and applies this to observed ratios between interim dividends and final dividends on a per stock level. These base projections are further updated on a weekly basis by the JSE Valuations team.

These projected dividends are used in the pricing of all equity derivative future mark-to-model processes, including single stock futures and all index futures other than the ALSI.

Proposal 1: Utilise third party vendor data for dividend projections

The JSE proposes that the internal dividend growth model is decommissioned for liquid equities and that dividend projections for these stocks are sourced by the JSE from a third party data vendor. This process would be automated within VIS and would be executed daily. A key question is the most appropriate choice of vendor, since the level of coverage of projection methodology does vary from vendor to vendor.

Q1: Which data vendor should the JSE consider as the most appropriate source for dividend projections on JSE listed equities?

For those underlying equities where the selected vendor does not provide projection data, the JSE will continue to use its internal dividend growth model approach. It may be that this approach does not reflect the consensus view of market participants, and this would ultimately reflect in the daily pricing of key futures such as the DTOP contract.

In the longer term, other considerations for dividend methodology may include the attempt to capture information contained within traded data. Inherent within actual futures trades is an interest rate assumption and dividend assumption. This data could be used to establish a sense of the projected dividends priced by the market and in essence traded at arm's length. Alternatively, a dividend yield approach could be employed for tenors greater than one year thus reducing the requirement for discrete projected dividends to a one year tenor.

At-the-Money (ATM) Volatilities

Current Methodology

The JSE considers a single particular Strike (“Anchor Strike”) for setting the ALSI ATM Volatility on any given day. Trades and orders on this strike that occur daily in a time period starting at 17:00 and ending at a random time up until 17:05 are considered for daily mark-to-market. There is no minimum order or trade size requirement.

All other index volatilities are marked at a static spread to the ATM volatility for the ALSI contract with the same expiry date. This spread can be updated from time to time.

For single stock futures, the JSE considers all trades reported during the course of the trading day, up until 17:15. Trades on all options with a moneyness level between 70% and 130% are included in the algorithm without reference to a volatility skew, and a minimum total trade size of 100 contracts is required to move the ATM volatility.

Where there is no market activity resulting in a re-marking of the ATM volatility, the JSE applies the daily movement in the underlying futures price to the volatility skew to adjust the ATM volatility on a sticky-delta basis. The JSE has the flexibility to re-mark ALSI ATM Volatilities if the published level is stale for more than a week, but does not currently have this discretion for single stock volatilities.

Proposal 2: Expand the market data considered for ALSI ATM Volatility

The JSE proposes to expand the market data inputs that are considered on a daily basis in order to set the ALSI ATM Volatility. This can be considered by increasing the time window where market data is scanned, or by increasing the number of option strikes that are included in the closing price algorithm.

- Expand the time window beyond 5 minutes at end of day to capture a longer period of market activity at the close. For example, consider market activity between 16:00 and 17:00 each day. In this case, careful consideration should be made for observing market order activity over this hour – for example by considering the best bid/best offer at exactly 17:00, or taking an average double over the full hour.
- Expand the number of option strikes that are considered at-the-money beyond the current rule of using a single strike. This could be measured in number of strikes, index points or a moneyness range.

For the sake of clarity, no suggestion is being made to modify the mark-to-market methodology for ALSI futures, which will continue to be priced using a snapshot between 17:00 and 17:05.

For the purposes of providing a straw man proposal, the JSE suggests a time window of 1 hour from 16:00-17:00, and consideration of activity on all options with a moneyness level between 97% and 103%, relative to the closing ALSI MTM level.

Q2: What time window should be considered when determining the closing level of ALSI ATM volatility?

Q3: How should any open orders be treated that are active during this time window and not executed on?

Q4: Which option strikes should be included for the purposes of determining the closing level of ALSI ATM volatility? If more than one, how should these be defined?

Furthermore, the JSE will continue to apply a volatility skew adjustment on a daily basis in the event that there is no qualifying market activity. Any contracts that continue to be stale will be reviewed on a weekly basis based on market activity, third party data and the professional judgement of the JSE Valuations team.

Proposal 3: Re-price the ATM volatility for other index contracts using market data

The ATM volatility for all other index contracts (e.g. DTOP, DCAP) will still be price at a spread to the ALSI contract with the same expiry date. However, this spread will be automatically reviewed on a daily basis using an identical methodology as that applied to ALSI contract. For example, trades on a DEC19 DTOP 101% contract at 16:30 would be used to re-mark the prevailing ATM volatility spread of the DTOP DEC19 contract relative to the ALSI DEC 19 contract.

Proposal 4: Review of illiquid single stock futures

The JSE will review the ATM volatility of stale single stock contracts with open interest on a weekly basis. This review will incorporate any ATM volatility changes for the same underlying but with different expiry dates, broad market movements in volatility, third party data and the professional judgement of the JSE Valuations team. As a result of this review, the ATM volatility for certain positions may be adjusted in line with prevailing market movements even in the absence of market activity in that particular contract.

Implied Volatility Surface

Current Methodology

The JSE currently marks the ALSI skew according to data provided by a vendor which undergoes the necessary governance and scrutiny on their end. This process is conducted once a week on a Tuesday morning. Stale ATM levels are also adjusted using this data as an input. The same implied volatility surface (the surface also captures the term structure of implied volatility as well) is used for all index futures.

The JSE uses a standardised skew for all single stock contracts across all expiry dates. This “convention” skew is not reviewed or updated based on market activity.

Introduction of a polling process governed by the JSE

There are arguments for and against the JSE directly polling the market for implied volatility surfaces on a bilateral basis. It is essential that any inputs received through a process of this nature are transparent and executable, otherwise there is a risk of a conflict of interest. In line with principles and regulation governing benchmark determination, the JSE would only consider a direct polling process under the auspices of a formal code of conduct for all contributors, together with public dissemination of the contributed rates. Furthermore, the contribution mechanism would require end-to-end automation with an audit trail (as opposed to a manual email or telephonic approach). Given the governance complexities and risk associated with a direct JSE polling process, the JSE does not currently endorse this approach.

Proposal 5: ALSI skew built using JSE market data

The JSE proposes that an in-house skew is constructed on a weekly basis by the JSE Valuations Team. This skew will be calibrated using traded option data observed on the JSE equity derivative market, and will consider trades on all liquid variations of the Top 40 contract (i.e. ALSI, DTOP and DCAP at this stage). Preliminary results show that the ALSI contract (including “Anyday” contracts) comprises two thirds of the overall index options trade data, although this does vary markedly from week to week.

A fitted skew will look to use consistent regression methodology that best incorporates the observed trade data that is collected through the JSE’s trading engine.

Proposal 6: Single stock skews build using JSE data

The JSE proposes that a range of in-house skews are constructed for single stock contracts by the JSE Valuations Team. For contracts where insufficient market data is available, the existing “convention” skew will continue to be used. For contracts with some trade activity, the following approach is proposed:

- Contracts with sufficient liquidity in their own right will have a bespoke skew built
- For the remaining illiquid contracts, a small number (i.e. 3-5) separate sector skews will be calibrated using traded volatility for all instruments that fall within that sector classification. This sector skew will then be applied to all corresponding single stock contracts

Sector skews will be updated when there is sufficient market activity to warrant this, but no more frequently than once per week.

Responding to the consultation

Any interested market participant is invited to respond to this methodology consultation. All responses should be made with respect to the numbered proposals and ancillary questions, and should include the details of the respondent, as well as their role in the equity derivatives market.

Responses should be directed in writing to valuations@jse.co.za no later than Friday, 9 August 2019.

The results of the consultation will be presented at the Financial Derivatives Advisory Committee (FDAC) meeting scheduled for 14 August 2019. Where there is broad support from the market, any changes will be presented to FDAC for final comment.

The JSE would also like to meet with market participants to discuss any further comments, suggestions or concerns. Please contact us at the email address provided above, should you wish to arrange a meeting in this regard.

Implementation timelines

Following the successful launch of the internal JSE valuations systems as part of the ITaC go-live, the JSE is looking to leverage this technology to implement appropriate valuations improvements as quickly as possible. A number of the proposals in this document can be implemented rapidly, and the JSE is targeting to implement all approved changes in 2019. Proposals 2 to 4 are targeted for quarter 3 implementation, and proposals 1, 5 and 6 for quarter 4.

It should also be noted that the changes proposed in this note are not exhaustive and may trigger a second round of methodology enhancements in 2020. Two key considerations that may get airtime in 2020 are:

- Daily volatility skew amendments to reflect option trades that are not at-the-money. Under this model, the shape of the skew (rather than the ATM volatility) can be adjusted on a daily basis to reflect observed trades.
- Inclusion of market order data (bids and offers) when constructing the volatility skews for both index and single stock products. Under this approach, a standard window is defined for members to quote volatilities along the skew and for these to be reflected in the closing price.

Should you have any queries regarding this notice, please contact valuations@jse.co.za

This Market Notice will be available on the website at <https://www.jse.co.za/redirects/market-notice-and-circulars>