

## JSE Equity Derivative Dividend Futures

### 1. Background

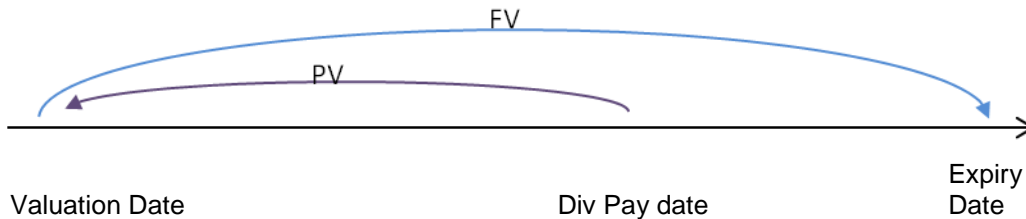
The JSE was the first exchange in the world to list Dividend Futures (also referred to as F-Contracts). F-Contracts were specifically designed to eliminate dividend assumption risk when pricing an Index or Single Stock Future. Subsequently the JSE's F-Contract product has gone through several versions/upgrades since its inception:

1. The Bucket Version – this was the first F-Contract whereby participants had to buy multiple expiries in order to be dividend neutral on a SSF position on a far-out expiry. It is important to note that with this version of the product, the MtM value post ex-date was set to the actual dividend value and the contract kept this same value until its expiry. This method caused quite a few problems as participants had to remember what the dividend was in the period and if more than one dividend was declared in one period, the participant had to keep including all dividends, even after they had gone ex.
2. Mark 2 – With this version, participants only had to buy the F-Contract with the same expiry as their SSF position in order to be dividend neutral on a position. In order to make the product easier to use, it was agreed that the dividend value would be set to zero on the dividend's ex-date. By making the dividend zero, the JSE made it very easy for participants as they did not have to keep record of old dividends that might have been paid during a term when calculating the F-Contract value. In order to make the dividend value zero, the JSE had to introduce a new "journal transaction" mechanism. This allowed for a correction or resetting action to flow through the normal profit and loss cashflows. The logic was that if you make the value of the F-Contract zero from its ex-dividend value there will be a loss for the person long the contract and a profit for the person short. The Journal transaction would then correct these cashflows and in effect reset the price of the contract.
3. Mark 3 – This is the current version of F-Contract listed on the JSE Equity Derivatives Market and was introduced upon request from market participants wanting to make markets on the Dividend Neutral Contract (N-Contract). The N-Contract on Nutron is a virtual contract trading on a virtual order book. Position holders will therefore never obtain a physical position in the N-Contract but would rather receive a Single Stock Future (Q-Contract) and a F-Contract position, upon trading the N-Contract. As a result N should be equal to Q + F. Due to Mark 2 and the fact that the F-Contract did not get future valued, the N-Contract equation did not hold and  $N \neq Q + F$ . The JSE and its Clearing Members then implemented a software change in October 2010 to also Forward Value the F-Contract in order to get  $N = Q + F$ . Read more about N-Contracts at [www.jse.co.za/dnsf](http://www.jse.co.za/dnsf)



## 2. F-Contract Calculation

The calculations of F-Contract are obviously different for Index vs. Single Stock F-Contract. For both Index and Single Stocks the general rule is however that we first present value all dividends that falls in the period (valuation date to expiry date) and then future value to expiry date:



### 2.2 Single Stock F-Contract Calculation

$$SS \text{ Dividend Future MTM} = \text{Discounted Dividend} \times e^{\left( \text{Yieldrate} \times \frac{\text{DaysOut}}{365} \right)}$$

*Discounted Dividend*

Single Stock Dividend Future is the discounted dividends (see below)

*Yieldrate*

Interest rate from the JSE Yield curve on the valuation date with term date = expiry date of the contract

*DaysOut*

Days out = number of calendar days between the valuation date and the expiry date

$$\text{Discounted Dividend} = \text{Dividend} \times e^{\left( -1 \times \text{Yieldrate} \times \frac{\text{DaysOut}}{365} \right)}$$

*Dividend*

Forecasted/Declared dividend amount

*Yieldrate*

Interest rate from the JSE Yield curve on the valuation date with term date = Payable date of the dividend

*DaysOut*

Days Out = number of calendar days between the valuation date and the payable date of the  $k^{\text{th}}$  dividend.

### 2.1 Index F-Contract Calculation

$$\text{Index Dividend Future MTM} = \text{IDF} \times e^{\left( \text{Yieldrate} \times \frac{\text{DaysOut}}{365} \right)}$$

*IDF*

Index Dividend Future is the total value of the dividend futures in the index on the valuation date (in index points) using discounted forecasted/declared dividends (see below)

*Yieldrate*

Interest rate from the JSE Yield curve on the valuation date with term date = expiry date of the contract

*DaysOut*

Days out = number of calendar days between the valuation date and the expiry date

$$IDF = \left\{ \sum_{i=1}^k MCAP_i \right\} / Divisor = \left\{ \sum_{i=1}^k DiscountedDividends_i \times SII_i \times FreeFloat_i \right\} / Divisor$$

$k$	The number of constituents in the index on the valuation date
$Divisor$	The index divisor as at close of business on the valuation date
$MCAP_i$	The total market capitalisation of the $i^{th}$ constituent's dividends at close of business on the valuation date
$DiscountedDividends_i$	Discounted value of forecasted/declared dividends for the $i^{th}$ constituent in the index that is due on or before the contract expiry date. (see below)
$SII_i$	The number of FTSE shares in issue for the $i^{th}$ constituent
$FreeFloat_i$	The Free Float for the $i^{th}$ constituent

$$DiscountedDividends_i = \sum_{k=1}^n Dividend_k \times e^{\left( -1 \times Yieldrate_k \times \frac{DaysOut_k}{365} \right)}$$

$n$	Number of dividends for the $i^{th}$ constituent in the index with ex-date between the valuation date and contract expiry date
$Dividend_k$	Forecasted/Declared dividend amount per share in the index
$Yieldrate_k$	Interest rate from the JSE Yield curve on the valuation date with term date = Payable Date of the $k^{th}$ dividend
$DaysOut_k$	Days Out = number of calendar days between the valuation date and the payable date of the $k^{th}$ dividend.

### 3. Examples of F-Contracts

Example of a Single Stock F-Contract Anglo American PLC -> AGLF

Example of an Index F-Contract for the ALSI -> ALSF

The latest values for the above can be observed as [www.jse.co.za/mtm](http://www.jse.co.za/mtm)

### 4. Speculative Dividend Futures

As previously stated, the F-Contracts listed on the JSE were specifically designed to eliminate dividend assumption risk and were not designed to be traded naked (without having a corresponding Single Stock or Index position). As a result the JSE currently don't charge any booking fees or initial margin on these instruments. The JSE will be implementing an enhancement in a future release that will validate whether the F-Contract has a corresponding Single Stock or Index position and then charge booking fees and initial margin accordingly.

Due to market participants requesting the ability to speculate on Dividend Futures, the JSE started researching Dividend Futures internationally. In Europe speculation in Dividend Futures is quite popular and is usually traded as a Reset Dividend Future. This instrument is straight forward and does not have any present or future valuation associated with it. The instrument accumulates the dividends of each constituent

of an Index over a certain year. This Index starts at zero after the December expiration and will be reset one year later. This way the separate yearly dividends will be open for trading, so the Dec'13 Dividend Future will only represent the dividends declared in 2013.

As the JSE has a partnership with FTSE to calculate the FTSE/JSE Africa Index series, the JSE approached FTSE to develop a Dividend Index. J2DV is a FTSE/JSE Top 40 Dividend Index that represents the cumulative value of ordinary cash dividends declared by the individual constituents of the underlying FTSE/JSE Top 40 Index, calculated on the ex-dividend date and expressed in terms of index points. The index includes cumulative dividends from 1 January 2002. J2DV is calculated daily and is freely distributed to all JSE data subscribers. There is currently no dividend futures contract listed on the J2DV index but the JSE would happily list one upon requests from the market.

As J2DV is not identical in nature to what trades internationally, the JSE approached FTSE to create a reset version of J2DV. This index is still work in progress. Market participants are however reminded that that the only time the FTSE/JSE calculated index value will be used for mark-to-market (MtM) purposes are on the expiry date. The MtM value for Speculative Dividend Futures will therefore be independently calculated by the JSE MtM valuation team and only on closeout we'll use the official FTSE/JSE Index value when there's conversion between the future and index.