Dividend Neutral Contract (N-contract)
N = Q + F

The Dividend Neutral (N-contract) is a basket of two futures contracts, essentially constructed from a Single Stock Futures Contract (Q- Contract) and a Dividend Futures Contract (F-Contract). For instance if the client bought AGL shares, the broker would trade it in the market as an AGLN. The client would receive an AGLQ contract and a AGLF contract.

The Effect of the Dividend on Futures Contracts

Futures contracts are agreements applicable to a specified date in the future, therefore we are not always 100% sure what the dividend amount will be. In the past in order to value/price futures contracts traders would make assumptions about this future amount. A good example of this uncertainty was when a large blue-chip company, namely Anglo American, consistently paid a dividend every year except in 2008.

In theory, a share price will fall by the same amount as the dividend paid on the back of that share. For a shareholder this is not a problem as his/her asset (share) is worth less but another asset (in the form of cash) increases by the dividend amount paid.

The dividend paid causes an imbalance in the Single Stock Future (SSF) as the SSF Contract holders are not entitled to the dividends paid. When the dividend is paid the share price will fall and the long holder of the SSF will have to pay the drop in price to the short holder of the SSF through the daily Mark-to-market process

The internationally accepted standard for pricing up SSFs is to subtract the discounted dividend (DD) from the spot price of the share, which will then correct the cashflow mismatch brought about by a dividend payment:

$$SSF = (Spot - DD) * (1 + Rate)^{time}$$

The dividend used in pricing futures contracts is a forecasted dividend which could or could not be realised in the future. In turn the party that sold the SSF is at risk of having done so at too low a price if a lower dividend or no dividend is paid and vice versa if the dividend is higher.

In order to eliminate the risk associated with assumed dividends, parties involved in a SSF transaction can also enter into a Dividend Futures Contract/Agreement. The cashflows associated with a Dividend Future (F-Contract) are the same as with any futures contract, i.e. if the declared dividend is more than the assumed dividend the long holder will receive cash from the short holder and vice versa. As a result the Dividend Future equation is the discounted dividend valued at a future date:

$$Dividend\ Future = (DD) * (1 + Rate)^{time}$$

F-Contract Example

If you are buying a future on a share trading at R50 and the liquidity provider has estimated a R1 dividend- then they will lower the funding interest they charge you by R1 (adjusted for the time value of money.) If the company instead pays a dividend of R3 then the liquidity provider will have charged you about R2 more than they should have. If the company does not pay the dividend then the liquidity provider will have charged R1 less than they should have. This is dividend estimation risk.

Journal Transactions

Ex-date is the day after the Last Day to Trade (LDT) and means that any person acquiring a share on or after this date will not qualify for the declared dividend. The share price will therefore trade at a price excluding the dividend amount paid on this date.

As these products function in a world with daily margining, the dividend cannot just be reduced to zero on ex-date as this will mean a negative cashflow from the long holder and a positive cashflow to the short holder of the F-Contract. In order to correct these cashflows, the JSE has introduced a 'Journal Transaction' which will create equal and opposite legs to the cashflows associated with removing the dividend. It in essence resets the price of the dividend futures contract without any cashflows, in light of the actual dividend. Another way of thinking of the Journal Transaction is that if the dividend is not made zero on ex-date, investors will need to remember what the dividend value was in the past. The Journal Transaction can therefore also be seen as the mechanism that clears the dividend history.

N = Q + F

The N-Contract 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 Dividend Future (F-Contract) position, upon trading the N-Contract. As a result N should be equal to Q + F.

Pricing N-Contracts

<div align="center">

N-Contract = SSF + Dividend Future

</div>

A futures price is often called a fair value price. To calculate this price the below formula can be used:

$$SSF = C - DD + F$$

Where
SSF = Fair Value of the futures contract
C = Current Spot price
F = Financing Cost
DD+ Discounted Dividend

$$F = C \times (r/100 \times t/365)$$

Where

r = annual borrowing rate

t = days between entering into the futures contract and the expiry thereof

The dividend likely to be received during the life of the futures contract is called the Discounted Dividend (if no dividend is expected during the contract period this element is ignored).

$$DD = Dividend / ((1+r/100)^{(v-p/365)})$$

Where

r = annual borrowing rate

v = dividend payment date

p = current date

Therefore:

$$\text{N-Contract} = [(Spot - DD) * (1 + Rate)^{time}] + [(DD) * (1 + Rate)^{time}]$$

If we had to write out the formula:

$$\text{N-Contract} = [(Spot) * (1 + Rate)^{time}] - [(DD) * (1 + Rate)^{time}] + [(DD) * (1 + Rate)^{time}]$$

The 2 Dividend Futures values cancel each other out and we're only left with the following:

$$\text{N-Contract} = [(Spot) * (1 + Rate)^{time}]$$

The N-Contract is therefore simply the spot price of the share plus interest. The method of resetting the fair value down is designed to make the dividend assumption redundant for the individual investor.

N-Contract Cashflows Example

The following assumptions are made in the cashflow example given below:

- The SSF Buyer (long) is a retail client and the SSF Seller (short) is a liquidity provider who will hedge oneself by buying the underlying share;
- The underlying share price stays constant at R100 until ex-dividend date at which point it will drop to R95;
- On day 1 when the contract was agreed a dividend of R10 was assumed. The declared dividend is eventually only R5;
- The SSF is 1 contract = 1 share with a 1 year contract or expiry.

NOTE: Equity spot market transactions for the liquidity provider are highlighted in yellow and the Journal Transaction resetting the Dividend Future Price is highlighted in purple.

In order to calculate the Dividend Future (F-Contract), all discounted dividends must be forward valued to expiry date. The Dividend Future (F contract) is first Present Valued (PV) from pay date and then Forward Valued (FV) to expiry date. In both PV and FV a 10% annually compounded interest rate is used.

Date	Explanation	Underlying Market Values		MtM Q	MtM F	Long SSF Buyer - Retail Investor			Short SSF - Liquidity Provider		
		Stock Price	Dividend			Q Cashflow	F Cashflow	Total Cashflow	Q Cashflow	F Cashflow	Total Cashflow
2010/01/01	N Contract traded: Priced by just adding interest to spot. System will create Q contract at the price N was traded and a F contract at 0	100	10	110.00	-	No cashflows as this line represents the N-contract trade on Safex during the day…					
2010/01/01	EOD JSE MtM - Assumed a dividend of R10	100	10	99.55	10.45	-10.45	10.45	-	10.45	-10.45	-
	Underlying equity spot market transaction: Liq Provider hedge by buying physical share										-100.00
2010/04/01	Div Declared (Only R5 and not R10 as assumed)	100	5	102.22	5.23	2.67	-5.23	-2.55	-2.67	5.23	2.55
2010/06/30	Last date to trade (LDT)	100	5	99.72	5.23	-2.50	-	-2.50	2.50	-	2.50
2010/07/01	Ex Date: Exchange makes F contract value 0	95	5	99.68	-	-0.05	-5.23	-5.27	0.05	5.23	5.27
	New derivative journal entry. Also refer to as a resetting transaction: Forward Value dividend from Pay Date to Contract Expiry date						5.23	5.23		-5.23	-5.23
2010/07/15	Div Pay Date: Spot price fell from R100 to R95	95	5	99.31	-	-0.36	-	-0.36	0.36	-	0.36
	Underlying equity spot market transaction: Actual Div Received in EQ market										5.00
2011/01/01	Closeout Date	95	N/A	95.00	-	-4.31	-	-4.31	4.31	-	4.31
	Underlying equity spot market transaction: Cash Settled: Liq Provider remove hedge by selling physical share Physical Settled: Liq Provider sell shares to long SSF holder via OX Trade type										95.00
	Interest on initial cash borough for hedge.										-10.00
	The dividend received on 15/07/2010 had to be reinvested until closeout date. This entry represents the interest earn on the										0.23
						-15.00	5.23	-9.77	15.00	-5.23	-

For additional information on Single Stock Futures contact:

Annabel Dallamore
Derivatives Specialist
Annabeld@jse.co.za
Tel: +21 11 520 7186
OR
JSE Limited – Derivatives Trading Division
Tel: +2711 520 7000
Email: derivativestrading@jse.co.za
www.jse.co.za