JOHANNESBURG STOCK EXCHANGE
Equity Derivatives

Dividend Neutral (N-Contract) Explained

It is important that the reader understand 3 concepts in order to understand JSE's Dividend Neutral Futures contract:

Concept 1:

In theory, a share price will fall the same value as the dividend paid. For a shareholder owning a share that's no problem as he's asset (share) is worth less but another asset (cash) increases with the dividend amount paid.

The dividend paid causes an imbalance in the Single Stock Future (SSF) as the SSF contract (Q-Contract) holders are not entitled to the dividends paid. When the dividend is therefore 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.

In order to correct the above casflow mismatch, the internationally accepted way of pricing up SSFs is to remove the discounted dividend (DD) from the equation when pricing up SSFs:

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

Note that the party selling the SSF is therefore selling the SSF at a lower price but if hedged through buying the underlying share, they will receive the dividend payment which they discounted in the original SSF agreed price.

Concept 2:

The next concept refers to the fact that futures contracts are agreements applicable to a specified date in the future and that we're not always 100% sure what the dividend amount will be leading up to that future date. A very good example of a big blue chip company that pays a dividend every year and then in 2008 did not pay a dividend is Anglo American.

The dividend therefore used in concept 1 could be an assumed dividend which could or could not realise in the future. The party that therefore sold the SSF is at risk that if a lower dividend or no dividend is paid, they sold it at too low price 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 Future contract/agreement. The cashflows associated with a Dividend Future (F-Contract) is the same as with any futures contract: I.e. if the declared div is more than assumed div the long holder will receive cash from the short holder and vice versa. As a result the Dividend Future equation is the discounted dividend future valued:

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

Concept 3:

Ex-date is the day after the LDT- date (Last Day to Trade) and means that any person acquiring the 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 from this date.

As we're in a futures world with daily margining, the dividend cannot just be made zero on ex-date as this will mean a negative cashflow from the long holder and a positive cashflow for 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 basically resets the price of the future contract without any cashflows. Another way of thinking of the journal transaction is the fact 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 memory.

Conclusion:

The JSE's Dividend Neutral (N-Contract) is a combination of concept 1 and 2above, i.e. the SSF plus the Dividend Future. In formula terms this will be:

N-Contract = SSF + Dividend Future

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

If we had to write out the formula:

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

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

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

The N-Contract is therefore simply spot price of the share plus interest. Very important to note though is that the N-Contract is a virtual contract and which, once traded, will generate 2 contracts (SSF and Dividend Future) for the investor. The combination of these contracts will ensure both parties to a SSF transaction is protected against an incorrect dividend assumption.

Cashflow example:

Below a cashflow example illustrating the 3 concepts included in the JSE's Dividend Neutral Future contract. The following assumptions are made in the example:

- It is assumed the SSF Buyer (long) is a retail client and the SSF Seller (short) is a liquidity provider who will hedge by buying the underlying share.
- It assumes that the underlying share's price stays constant at R100 until div ex-date when it drops to R95.
- On day 1 when the contract was agreed a dividend of R10 was assumed. The declared dividend is eventually only R5
- It assumes the SSF is 1 contract = 1 share and a 1 year contract or expiry.
- Equity spot market transactions for the liquidity provider is highlighted in yellow
- The Journal transaction resetting the Dividend Future Price is highlighted in purple

Date	Explanation	Underlying Market Values		MtM Q	MtM F	Long SSF Buyer - Retail Investor			Short SSF - Liquidity Provider		
		Stock Price	Dividend			Q P&L	F P&L	Total P&L	Q P&L	F P&L	Total P&L
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 transaction: Div Payment from short to long (PV of dividend from Ex Date to Pay date)							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 reivestment.										0.23
						-15.00	-	-9.77	15.00	-	-

Concept 2

Concept 1

Concept 3