**DI1 Interest Rate Futures**(1D Interbank Deposit Futures)

**Introduction**

Futures are short interest rate instruments, consequently being long a DI1 future is tantamount to being short CDI interest rates. Over the life of the futures contract when rates fall we profit and if rates climb we lose. Futures are exchange traded so any profit or loss is cash settled on a daily basis.

A DI1 futures contract purchases a future cash flow of BRL 100,000. The value of this cash amount is discounted using DI rates and is quoted as the cash settlement price. If on day 1 the discount factor is 0.90 say then the cash value is BRL 90,000. At contract maturity we receive the BRL 100,000.

DI1 futures are one-day interbank deposit futures (DI1) in the Brazilian onshore market. They have an underlying rate R computed as the average of 1D CDI rate compounded daily on a Bus/252 day count basis. (Note Bus/252 = Act/252)

**Daily Compounded Rate, R**

where the total number of interest days and = number of days each individual 1D CDI rate is applicable; every weekday counts for 1 day of interest except for Friday which counts for 3 days to account for interest payable on Friday and to carry the position over the weekend.

**Unit Price**

**100,000**

**Tick Size**

**0.01**

**Capitalization Factor**

DI1 futures represent BRL 10,000 discounted by the interest rate R. The discount factor is computed as the reciprocal of the growth or capitalization factor computed using simple compounding and rounded to 7 decimal places. The day count fraction is computed using a Bus/252 basis.

**CapFac =**

where we round the capitalization factor **to 7 decimal places** so that when multiplied by the unit price of 100,000 we can achieve a price **to 2 decimal places** with a tick size of 0.01.

**Discount Factor**

The discount factor is the inverse of the capitalization growth factor, rounded to 7 decimal places.

**DF = 1 / round( 1 / CapFac, 7 )**

**Traded Price**

The futures traded price (TP) is the unit price scaled by the discount factor and quoted to 2 decimal places.

**TP = round( 100,000 \* DF, 2 )**

**Futures Tickers**

The futures instrument ticker comprises of product + month + year e.g. DI1 + F + 23 = DI1F23, indicating DI1 Futures for delivery Jan 2023. The futures month Codes are as follows,

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Letter | F | G | H | J | K | M | N | Q | U | V | X | Z |

**Expiry Date**

The first business day of the contract month. For example, a DI1Z23 (December 2023) future would expire on the first business day of December 2023.

**Example**

A trader buys 100 DIF23 contracts traded at 10.00% DI rate. The B3 exchange (formerly BMF or BVMF Bolsa de Valores, Mercadorias e Futuros) uses cash settlement DI prices not rates, so B3 will convert the DI rate to a DI price rounded to 2 decimal places. What is the traded price?

**Expiry**

First business day of January 2023 (F23)

**Cap Factor**

**Discount Factor**

**Traded Price**

The initial trading price is quoted using 100,000 pricing units and capitalization factor specified determined by the traded interest rate i% with n days to expiry, where n as the number of days between the trade date and the day preceding expiry.

The cap factor and discount factors are rounded to 7 decimal places so that our unit traded price is quotes to 2 decimal places.

TP = 100,000 \* DF = BRL 94,484.70

**Futures Position**

**Daily Profit & Loss**

Futures are cash settled on exchange with daily P&L calculated as below,

P&L = Number of Contracts \* (Traded Price – Last Price)

**References**

**DI1 Contract Specifications**B3 Stock Exchange (formerly BMF Bovespa)  
<https://www.b3.com.br/en_us/products-and-services/trading/interest-rates/one-day-interbank-deposit-futures.htm>

**DI1 Technical Specifications**  
B3 Stock Exchange (formerly BMF Bovespa)   
<http://www.bmf.com.br/bmfbovespa/pages/contratos2/pdf/IDfutures.pdf>