FUTURES PRICING MANUAL

B3.COM.BR

31/07/2023

TABLE OF CONTENTS

General Provisions

This Manual presents the procedures to calculate settlement prices for financial derivatives futures contracts whose underlying assets are interest rates, foreign exchange, stock indices, or commodities.

The required calculation parameters, procedures, and criteria described are changed monthly and should be consulted in the Monthly Parameter Annex for the month in question.

In the event of partial or total unavailability of the inputs needed for the methodologies described in this Manual, and/or due to events of an economic or operational nature that may hinder price calculation coordination or the application of the corresponding methodology, B3, through its Market Risk Technical Committee, may at its sole discretion, arbitrate settlement prices.

Inputs used to price futures contracts are obtained from orders and trades on the trading floor, mainly through the **electronic closing call** and the **average calculation window** (). Other trading data, prices, and economic indicators may also be used. The **electronic closing call** is a mechanism at the end of the trading session used to set a single price for all trades that occur in the call, even if orders have different prices. The **average calculation window** is a trading period that uses trades made in that period and orders open at the end of the window to define the contract settlement price in accordance with the methodologies defined in this Manual.

A set sequence of procedures is used to calculate the settlement price of electronic closing call Futures contracts. If the first procedure cannot be applied, the second will be, and so forth successively until the settlement price is determined. The procedures involve the following definitions:

6

Market Pricing

(i)   **Valid trade,** typically denoted as the first procedure (P1), are the contract/expiration trades that meet the following conditions:

    a) Is present at the electronic closing call or during average calculation window.

    b) A Quantity greater than or equal to the minimum quantity threshold set by the Liquidity Group for the contract/expiration in question, as shown in the Monthly Parameters Annex.

    c) In the average calculation window, there must be at least 2 indirect trades (distinct intermediaries).

(ii)   **Valid Order**, is defined as an electronic closing call order that meets the following three conditions:

    a) Is present at the electronic closing call;

    b) 30 seconds minimum exposure;

    c) A Quantity greater than or equal to the minimum quantity threshold set by the Liquidity Group for the contract/expiration in question, as shown in the Monthly Parameters Annex. Traded contracts that have the same bid or ask price are also considered when assessing the quantity of bid and ask orders.

If there is more than one valid bid/ask order, the highest bid order the lowest ask order will be considered to be the valid order.

(iii)   **Valid bid-ask spread**, can be calculated in two ways, according to the Monthly Parameters Annex:

    a) Difference: the difference between the best **valid buy order** (VBO); and the best **valid sell order** (VSO) that is smaller than or equal to the threshold set ($Spread_{Max.}$) by the Liquidity Group for the contract/expiration in question, as shown in the Monthly Parameters Annex. As per the condition below:

$$\begin{cases} \text{if } VSO - VBO \leq Spread_{Máx.} \rightarrow Spread \text{ is valid} \\ \qquad \text{otherwise } Spread \text{ is not valid} \end{cases}$$

7

b) Percentual: the difference between the best **valid buy order** (VBO); and the best **valid sell order** (VSO) divided by the mid between the best **valid buy order** (VBO) and the best **valid sell order** (VSO), that is smaller than or equal to the threshold set ($Spread_{Max.}$) by the Liquidity Group for the contract/expiration in question, as shown in the Monthly Parameters Annex. As per the condition below:

$$\begin{cases} \text{if } \dfrac{VSO - VBO}{\dfrac{VSO + VBO}{2}} \leq Spread_{Máx.} \rightarrow Spread\ is\ valid \\ \qquad\qquad otherwise\ Spread\ is\ not\ valid \end{cases}$$

(iv) **VWAP: Volume weighted average price**, it is the top offers weighted average of the books captured in the time interval defined for the product, for each registered book at t seconds, resulting in m books inside de capture interval.

For each registered book (i), is computed:

a) OC_i, volume average price of the top bid orders, when the sum of contracts equals the minimum:

$$OC_i = \frac{\sum_n q_{i,n} * P_{i,n}}{Q_{min}}$$

$P_{i,n}$ bid offer of book i at level n;

Q_{min} contracts minimum quantity;

$q_{i,1} = min\{Q_{i,1}, Q_{min}\}$;

$q_{i,n} = min\{Q_{i,n}, Q_{min} - \sum_{j=1}^{n-1} q_{i,j}\}$, when $n > 1$; e

$Q_{i,n}$ contracts quantity at level n of book i.

b) OV_i, volume average price of the top ask orders, when the sum of contracts equals the minimum:

$$OV_i = \frac{\sum_n q_{i,n} * P_{i,n}}{Q_{min}}$$

8

$P_{i,n}$ ask offer of book i at level n;

Q_{min} contracts minimum quantity

$q_{i,1} = min\{Q_{i,1}, Q_{min}\}$;

$q_{i,n} = min\{Q_{i,n}, Q_{min} - \sum_{j=1}^{n-1} q_{i,j}\}$, when $n > 1$; e

$Q_{i,n}$ contracts quantity at level n of book i.

c) If there was computation of OC_i and OV_i , then the Mid price (OM_i) price is defined as follows:

$$OM_i = \frac{OV_i + OC_i}{2}$$

only when $OV_i - OC_i \leq Spread_{Max}$

Where $Spread_{Max}$ is the threshold defined for the contract.

Once all the books where analyzed, the final prices are given by the arithmetic average of the prices defined by the books i with value generated (bid, ask, mid). For the price be considered as valid, the number of books with price computed should be greater than the minimum for the contract m.

$$OFC = \frac{\sum_{j=1}^{N} OC_j}{N} \text{ , where N is the number of books with } OC_j \text{ computed}$$

$$OFV = \frac{\sum_{j=1}^{N} OV_j}{N} \text{ , where N is the number of books with } OV_j \text{ computed}$$

$$OMC = \frac{\sum_{j=1}^{N} OM_j}{N} \text{ , where N is the number of books with } OM_j \text{computed.}$$

(v) **Volume-Weighted Average Price at the End of the Closing Call**, which is the weighted average of the best offers, from the book, verified at the end of the Closing Call, for each month n.

9

For each book captured, for purchase ($Book_C$) and for sale ($Book_V$) respectively, at the end of the Closing Call, the average is calculated (OFC^n average for purchases, and OFV^n average for sell) of the best active orders at the end of the Closing Call ($P_{OfC,i}^n$ for buy orders, or $P_{OfV,i}^n$ for sell orders), weighted by the respective order quantity ($Q_{OfC,i}^n$ for buy orders, or $Q_{OfV,i}^n$ for sell orders).

The minimum quantity Q_{min}^n, will limit the orders to be considered in the calculation of each average, so that the sum of the quantities of each considered best offer is exactly equal to the minimum quantity. The last order to be considered, if it exceeds the minimum quantity, will be considered in the proportion enough for the sum to reach the minimum quantity on maturity n. If the sum of all Book X order quantities does not reach the Minimum Quantity, the weighted average OFX^n will not be considered valid.

$$from\ the\ buy\ book: OFC^n = \frac{\sum_i q_{OfC,i}^n * P_{OfC,i}^n}{Q_{min}^n}$$

$$from\ the\ sell\ book\ de\ compra: OFV^n = \frac{\sum_i q_{OfV,i}^n * P_{OfV,i}^n}{Q_{min}^n}$$

Where:

$$q_{OfX,1}^n = min\{Q_{OfX,1}^n, Q_{min}\};$$
$$q_{OfX,i}^n = min\{Q_{OfX,i}^n, Q_{min}^n - \sum_{j=1}^{i-1} q_{OfX,j}^n\},\ when\ i > 1.$$

It is possible to set a parameter to consider the trades carried out in the Closing Call, in the calculation of the Weighted Average, in case these trades do not have enough quantity to define the price using the pricing

10

method per trades (see topic **Valid Trade**). In this case, trades will be considered together with orders (only in one of the books, buy or sell), grouped by the same trade price P_{NEG}^n and orders ($P_{OfC,i}^n$ for buy, or $P_{OfV,i}^n$ for sell), adding the quantities of offers ($Q_{OfC,i}^n$ for purchases and $Q_{OfV,i}^n$ for sell) and Q_{NEG}^n trades.

$$if \ P_{NEG}^n \ = P_{OfC,i}^n \ \Rightarrow \ QT_{Ofc,i}^n = \ Q_{Ofc,i}^n + Q_{NEG}^n$$
$$if \ P_{NEG}^n \ = P_{OfV,i}^n \ \Rightarrow \ QT_{OfV,i}^n = \ Q_{OfV,i}^n + Q_{NEG}^n$$

And the weighted average OC_X^n of each book will be calculated using the Total Quantities of Trades and Offers QT, for each level of the Book, until the Minimum Quantity Q_{min}^n is reached. In the same way as using orders only, if the sum of all total quantities of a book *X* does not reach the Minimum Quantity, the weighted average OC_X^n referring to the book will not be considered valid.

$$from \ the \ buy \ book: OFC^n = \frac{\sum_i qt_{Ofc,i}^n * P_{OfC,i}^n}{Q_{min}^n}$$

$$from \ the \ sell \ book: OFV^n = \frac{\sum_i qt_{Ofv,i}^n * P_{OfV,i}^n}{Q_{min}^n}$$

Where:

$$qt_{OfX,1}^n = min\{QT_{OfX,1}^n, Q_{min}\};$$
$$qt_{OfX,i}^n = min\{QT_{OfX,i}^n, Q_{min}^n - \sum_{j=1}^{i-1} qt_{OfX,j}^n\}, \ when \ i > 1.$$

Note that orders will be considered, if they meet a minimum exposure time (t_{MIN}^n) within the Closing Call, to be considered valid. This time will be counted from the last modification of the order $t_{LastModif,i}^n$, until the end of the closing Call of expiry n ($t_{EndCall}^n$). The order must be present at the end of the closing call.

11

$$t_{EndCall}^{n} - t_{LastModif,i}^{n} > t_{MIN}^{n}$$

If the average of the buy orders OFC^{n} and the average of the ask orders OFV^{n} have been calculated and validated for a given month n, the mid price (OFM^{n}) will be given by the formula below, since the spread between OFV^{n} and OFC^{n} does not exceed the limit spread ($Spread_{MAX}^{n}$) for the expiry date:

$$OFM^{n} = \frac{OFC^{n} + OFV^{n}}{2},$$

only if: $OFV^{n} - OFC^{n} \leq Spread_{MAX}^{n}$

If the mid OFM^{n} is valid, it will be the final price for the order step of that month n. Otherwise, and if the average bid price OFC^{n} and/or the average ask price OFV^{n} are valid, they may be used to validate **the Theoretical Price** (Fallback) for the month in question, as described in the next chapter.

Theoretical Pricing

When **Market Pricing** requirements are not met, other procedures can be adopted to determine the **Theoretical Price (TP)** for adjusting the contract respecting the conditions below.

Theoretical Pricing when there are valid futures contract orders.

If there is a **valid order**, the final settlement price (SP) of the contract is defined using the criteria below:

1. If there is a **valid buy order** (VBO), then VBO≤ SP:

$$SP = max(VBO, TP)$$

12

2. If there is a **valid sell order** (VSO), then $SP \leq VSO$:

$$SP = min(VSO, TP)$$

3. If there is a valid buy order (VBO) and a valid sell order (VSO), then

$$VBO \leq SP \leq VSO:$$

$$\begin{cases} if\ TP < VBO, & SP = VBO \\ if\ TP > VSO, & SP = VSO \\ \quad otherwise, & SP = TP \end{cases}$$

The electronic closing call pricing criteria aims to maximize the quantity of traded contracts. Therefore, although orders may have different prices, all trades for the same expiration carried out at the electronic closing call are closed at a single price.

Finally, this manual presents the methodology used to define the official settlement price for each contract.

1 INTEREST RATES

1.1 Average One-Day Interbank Deposit Rate Futures Contract (DI1)

The settlement price for the Average One-Day Interbank Deposit Rate Futures Contract is expressed as an annualized interest rate.

The procedure sequence to determine the settlement price for a given DI1 expiration

If it is the last business day before contract expiration, the settlement price as a rate of the first expiration will correspond to the CDI (Interbank Deposit Certificate) rate of the day. If the contract expiring is due in January, the settlement price will be based on procedures P1 and P2, or, in their absence, the CDI reference rate of the day will be used.

P1. The settlement price will be the weighted arithmetic average of the trades carried out for that month, in the time interval according to the parameters of the Annex of Monthly Parameters of the calculation date.

P2. If procedure P1 cannot be applied, the settlement price for the expiration in question will be the average of the Mid-VWAP offer with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 1 of the Monthly Parameters Annex (the Mid-VWAP is defined in General Provisions section).

P3. If procedure P2 cannot be applied, the settlement price for the expiration in question will be calculated using by summing (i) the settlement price for the expiration in question on the immediately preceding day with (ii) the settlement price variation of the expiration in question, which is calculated by linear interpolation of the day's settlement price variation in relation to the immediately preceding day of the immediately previous(a) and following(p) expirations with settlement prices determined by P1 or P2, as per equation (1.0). Linear interpolation of the settlement price's daily variation in relation to the immediately

14

preceding day ensures that settlement prices with missing inputs have fluctuations compatible with the fluctuation of the already traded contract expirations.

$$PA_{i,t} = PA_{i,t-1} + \left(\Delta_a + \left(\Delta_p - \Delta_a \right) \times \frac{(DC_i - DC_a)}{(DC_p - DC_a)} \right) \qquad (1.0)$$

Where:

$PA_{i,t}$= settlement price for expiration i on the calculation date resulting from the application of procedure P3, rounded to the third decimal place;

$PA_{i,t-1}$= settlement price for expiration i on the business day prior to the calculation date;

$\Delta_a = PA_{a,t} - PA_{a,t-1}$= difference between the settlement prices of the calculation date and the previous business day for the expiration with settlement price immediately before the interpolated expiration;

$\Delta p = PAp,t - PAp,t-1$ = difference between the settlement prices of the calculation date and the previous business day for the expiration with settlement price immediately after the interpolated expiration;

DCa = the number of calendar days between the calculation date and the expiration date a;

DCp = the number of calendar days between the calculation date and the expiration date p;

DCi = number of calendar days between the calculation date and the expiration date of the interpolated expiration i.

P3.1. If it is the first trading day of the contract i and no settlement price has been determined by procedures P1 or P2, having previous expiration (*a*) with a settlement price defined by P1 or P2 and a following expiration (*p*) with a

15

settlement price defined by P1 or P2, the settlement price of contract *i* will be obtained from the exponential interpolation of the forward term structure, given by equation (1.1):

$$PA_i = \left((1 + SP_a)^{\frac{DU_a}{252}} \times \left(\frac{(1+PA_p)^{\frac{DU_p}{252}}}{(1+PA_a)^{\frac{DU_a}{252}}} \right)^{\frac{DU_i - DU_a}{DU_p - DU_a}} \right)^{\frac{252}{DU_i}} - 1 \qquad (1.1)$$

where:

PA_i = settlement price for the expiration *i* resulting from exponential interpolation, rounded to the third decimal place;

PA_a = settlement price for the expiration a immediately preceding the interpolated expiration (expiration i);

PA_p = settlement price for the expiration p immediately subsequent to the interpolated expiration (expiration i);

DU_a = number of trading days between the calculation date and the expiration date of the expiration a;

DU_p = number of trading days between the calculation date and the expiration date of the expiration p;

DU_i = number of trading days between the calculation date and the expiration date of the interpolated expiration i.

P4. If procedure P3 cannot be applied due to the absence of a later expiration settlement price, the settlement price for the expiration in question will be calculated using equation (1.2) by summing (i) the settlement price for the expiration in question on the immediately preceding day with (ii) the daily settlement price variation on the day immediately preceding the last expiration

settlement price. If the price obtained through this procedure does not result in a **valid order price** (i.e. the price is lower than a **valid bid price** or higher than a **valid ask price**), the settlement price will be the **valid order price** with the closest value. In this situation, this expiration ($v − 1$) will be considered a reference for the second part of the equation (1.2) for all longer expiration.

$PA_{v,t}$ = settlement price for expiration i on day t with $v − 1$ being the expiration immediately preceding v. The calculation procedure P4 uses equation (1.2), rounded to the third decimal place:

$$PA_{i,t} = PA_{i,t-1} + \Delta_{i-1,t} \tag{1.2}$$

Where:

$\Delta_{i-1,t} = PA_{i-1,t} − PA_{i-1,t-1}$ = daily variation of the expiration $i − 1$ in t.

P5. If procedure P3 cannot be applied due to the absence of a preceding expiration settlement price, including first expiration defined by P1 or P2, the following procedure is used to determine the settlement price of the expiration in question:

E1. The settlement price is defined as the weighted average trading price at interval time defined for the contract, even if it does not have the minimum amount required (see Annex of Monthly Parameters) to be considered valid;

E2. If there are no trades defined at E1, the weighted average of the trades made that day up until the moment before the start of the interval time of the price definition;

E3. If there is no previous expiration settlement price as defined by E1 or E2, the one-day variation of the immediate subsequent expiration in which the settlement price was defined by P1, P2, E1, or E2 is applied to the settlement price of the previous day of the contract in question;

E4. If there is a previous expiration settlement price as defined by E1 or E2 and a later expiration defined by P1, P2, E1, or E2, the settlement price is obtained by linearly interpolating the daily settlement price variation in relation to the immediately previous day (Equation 1.0), using the immediately previous expiration where the settlement price was defined by E1 or E2 and the immediately subsequent expiration where the settlement price was defined by P1, P2, E1, or E2 as pivots in the interpolation.

1.2   DI x U.S. Dollar Spread Futures (DDI)

The ID x U.S. Dollar Spread Futures Contract settlement price is expressed as an annualized interest rate.

DDI settlement prices are calculated using non-arbitrage formulas. The methodology for calculating the first open expiration differs from the methodology for calculating other expirations. On the two days prior to the expiration date of the first open expiration, the methodology for the other expirations is not uniform, due to the rollover of the short DI x U.S. Dollar Spread Futures (short leg) of the FRA on the ID x U.S. Dollar spread (FRC) as shown in section 1.3 and used as input for the calculation of settlement prices.

1.2.1   First Open Expiration

The settlement price for the first DDI expiration is calculated using equation (1.3):

$$PA_{DDI_t^{1exp}} = \left(\frac{\left(1 + \frac{PA_{DI_t^{1exp}}}{100} \right)^{\frac{DU_{1exp}}{252}}}{\left(\frac{PA_{DOL_t^{1exp}}}{DOLPtax_{t-1} \times 1000} \right)} - 1 \right) \times \frac{360 \times 100}{DC_{1exp}} \qquad (1.3)$$

Where:

$PA_{DDI_t^{1exp}}$ = settlement price for the first DDI expiration on the date *t,* rounded to the third decimal place;

18

$PA_{DI_t^{1exp}}$ = settlement price for the first DI1 expiration on the date t;

$PA_{DOL_t^{1exp}}$ = settlement price for the first expiration of the U.S. Dollar Futures Contract (DOL), as referenced in section 2.1, on the date t;

$DOLPtax_{t-1}$ = Brazilian Real per U.S. Dollar exchange selling rate using PTAX800, published by the Central Bank of Brazil on the date $t - 1$;

DU_{1exp} = number of trading days between the calculation date t and the date of the first DI1 expiration;

DC_{1exp} = number of calendar days between the calculation date t and the date of the first DDI expiration.

1.2.2 Other Open Expirations

Settlement prices for other DDI expirations are calculated using equation(1.4):

$$PA = \left(\left(1 + PA_{DDI^{1exp}} \times \frac{DC_1}{360 \times 100}\right) \times \left(1 + PA_{FRC^n} \times \frac{DC_n - DC_1}{360 \times 100}\right) - 1\right) \times \frac{360 \times 100}{DC_n} \quad (1.4)$$

Where:

PA_{DDI^n} = settlement price for the nth DDI expiration, rounded to the third decimal place;

$PA_{DDI^{1exp}}$ = settlement price for the first DDI expiration;

PA_{FRC^n} = settlement price for the nth FRC expiration;

DC_n = number of calendar days between the calculation date t and the date of the nth FRC expiration;

DC_1 = number of calendar days between the calculation date t and the date of the first DDI expiration .

In the two-day period prior to the expiration of the first open expiration, the other expirations will be dealt with using the process below.

Second Open Expiration

Settlement price for the second open DDI expiration is calculated using equation (1.5):

$$PA_{DDI_t^{2exp}} = \left(\frac{\left(1 + \frac{PA_{DI1_t^{2exp}}}{100}\right)^{\frac{DU_{2exp}}{252}}}{\left(\frac{PA_{DOL_t^{2exp}}}{DOLPtax_{t-1} \times 1000}\right)} - 1 \right) \times \frac{360 \times 100}{DC_{2exp}} \qquad (1.5)$$

Where:

$PA_{DDI_t^{2exp}}$ = settlement price for the second DDI expiration on the date t, rounded to the third decimal place,

$PA_{DI1_t^{2exp}}$ = settlement price for the second DI1 expiration on the date t;

$PA_{DOL_t^{2exp}}$ = settlement price for the second DOL expiration on the date t ;

$DOLPtax_{t-1}$ = Brazilian Real per U.S. Dollar exchange selling rate using PTAX800, published by the Central Bank of Brazil on the date $t-1$;

DU_{2exp} = number of trading days between the calculation date t and the date of the second DI1 expiration;

DC_{2exp} = number of calendar days between the calculation date t and the date of the second DDI expiration.

Other Open Expirations

Settlement prices for other DDI expirations are calculated using equation (1.6):

20

$$PA_{DDI^n} = \left(\left(1 + PA_{DDI^{2exp}} \times \frac{DC_2}{360 \times 100}\right) \times \left(1 + PA_{FRC^n} \times \frac{DC_n - DC_2}{360 \times 100}\right) - 1\right) \times \frac{360 \times 100}{DC_n} \quad (1.6)$$

Where:

PA_{DDI^n} = settlement price for the nth DDI expiration, rounded to the third decimal place;

$PA_{DDI^{2exp}}$ = settlement price for the second DDI expiration;

PA_{FRC^n} = settlement price for the nth FRC expiration;

DC_n = number of calendar days between the calculation date and the date of the nth FRC expiration;

DC_2 = number of calendar days between the calculation date and the date of the second DDI expiration.

1.3 FRA on ID x U.S. Dollar Spread (FRC)

The Structured Transaction Forward Rate Agreement on DI x U.S. Dollar Spread settlement price is expressed as an annualized interest rate.

The procedure sequence to determine the settlement price for a given expiration.

P1. The settlement price will be the price established at the electronic closing call for the expiration in question.

P2. If procedure P1 cannot be applied, the settlement price for the expiration in question will be the average **valid bid prices** and **valid ask prices** with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 2 of the Monthly Parameters Annex.

P3. If procedure P2 cannot be applied, the settlement price for the expiration in question will be calculated using equation (1.7) by summing (i) the settlement

price for that expiration on the day immediately prior to (ii)the settlement price variation of the expiration in question, which is calculated by linear interpolation of the day's settlement price variation in relation to the immediately preceding day of the immediately previous(*a*) and following(*p*) expirations with settlement prices determined by P1 or P2.

$$PA_{i,t} = PA_{i,t-1} + \left(\Delta_a + \left(\Delta_p - \Delta_a \right) \times \frac{(DC_i - DC_a)}{(DC_p - DC_a)} \right) \quad (1.7)$$

Where:

$PA_{i,t}$ = settlement price for the expiration *i* on the calculation date resulting from the application of procedure P3, rounded to the second decimal place;

$PA_{i,t-1}$ = settlement price for the expiration *i* on the business day preceding the calculation date or recalculated by equation (1.7.1) on the rollover date of the short end of the FRC;

$\Delta_a = PA_{a,t} - PA_{a,t-1}$ =difference in settlement prices between the calculation date and the previous business day for the expiration *i* with the settlement price immediately before the interpolated expiration;

$\Delta_p = PA_{p,t} - PA_{p,t-1}$ =difference in settlement prices between the calculation date and the previous business day for the expiration *i* with the settlement price immediately after the interpolated expiration;

DC_a= number of calendar days between the calculation date and the expiration date *a*;

DC_p= number of calendar days between the calculation date and the expiration date *p*;

DC_i = number of calendar days between the calculation date and the expiration date of interpolated expiration *i*.

On the FRC short leg rollover date, the previous business day's settlement price used in equation (1.7), is recalculated to take into account the new short leg DDI expiration *i*. The FRC settlement price for the previous day is recalculated using equation (1.7.1).

$$PA^*_{FRC^i,t-1} = \left(\frac{\frac{PA_{FRC^i_{t-1}}}{360 \times 100} \times \left(DC_{FRC^i} - DC_{DDI_1} \right) + 1}{\frac{PA_{FRC^1_{t-1}}}{360 \times 100} \times \left(DC_{FRC^1} - DC_{DDI_1} \right) + 1} - 1 \right) \times \frac{360 \times 100}{DC_{FRC^i} - DC_{FRC^1}} \qquad (1.7.1)$$

Where:

$PA^*_{FRC^i,t-1}$ = settlement price for expiration *i* of the FRC on the business day preceding the calculation date, recalculated so as to consider the new short leg rollover; rounded to the second decimal place,

$PA_{FRC^i_{t-1}}$ = settlement price for the FRC expiration *i,* corresponding to the FRC long leg on the business day after the calculation date.

$PA_{FRC^1_{t-1}}$ = settlement price for the most recent FRC expiration *i* that is no longer trading, on the business day preceding the calculation date;

DC_{FRC^1} = number of calendar days between the business day preceding the calculation date and the expiration date of most recent FRC expiration that is no longer trading;

DC_{FRC^i} = number of calendar days between the business day following the calculation date and the FRC expiration date *i* :

DC_{DDI_1} = number of calendar days between the business day preceding the calculation date and the expiration date of most recent DDI expiration that is no longer trading;

23

P3.1. If it is the first trading day of the contract i and no settlement price has been determined by the P1 or P2 procedures, having a previous expiration (a) with a settlement price defined by P1 or P2 and a subsequent expiration (p) with a settlement price defined by P1 or P2, the settlement price of contract i will be obtained using equation (1.8) which uses exponential interpolation of the settlement prices of the expirations immediately before and immediately after.

$$PA_i = \left(\left(1 + PA_a \times \frac{DC_a}{360 \times 100} \right) \times \left(\frac{\left(1 + PA_p \times \frac{DC_p}{360 \times 100}\right)}{\left(1 + PA_a \times \frac{DC_a}{360 \times 100}\right)} \right)^{\left(\frac{DU_i - DU_a}{DU_p - DU_a}\right)} - 1 \right) \times \frac{360 \times 100}{DC_i} \quad (1.8)$$

Where:

PA_i = settlement price for expiration i resulting from exponential interpolation; PA_a = settlement price for the expiration a immediately preceding the interpolated expiration i, rounded to the second decimal place;

PA_p = settlement price for expiration p immediately following the interpolated expiration i;

DU_a = number of trading days between the calculation date and the expiration date of expiration a;

DU_p = number of trading days between the calculation date and the expiration date of expiration p;

DU_i = number of trading days between the calculation date and the expiration date of expiration i;

DC_a = number of calendar days between the calculation date and the expiration date of expiration a;

24

DC_p = number of calendar days between the calculation date and the expiration date of expiration p;

DC_i = number of calendar days between the calculation date and the expiration date of expiration i.

P4. If procedure P3 cannot be applied due to the absence of a later expiration settlement price, the settlement price for the expiration in question will be calculated using equation (1.2) by summing (i) the settlement price for the expiration in question on the immediately preceding day with (ii) the daily settlement price variation on the day immediately preceding the last expiration settlement price. If the price obtained through this procedure does not result in a **valid order price** (i.e. the price is lower than a **valid bid price** or higher than a **valid ask price**), the settlement price will be the **valid order price** with the closest value. In this situation, this expiration ($i − 1$) will be considered a reference for the second part of the equation (1.9) for all longer expirations.

Where $PA_{i,t}$ = settlement price for the expiration i on day t, where $i − 1$ is the expiration immediately preceding i. Procedure P4 uses equation (1.9), rounded to the second decimal place:

$$PA_{i,t} = PA_{i,t-1} + \Delta_{i-1,t} \qquad (1.9)$$

Where:
$\Delta_{i-1,t} = PA_{i-1,t} − PA_{i-1,t-1}$ = daily variation of expiration $i − 1$ in t.

P5. If procedure P3 cannot be applied due to the absence of a previous expiration with settlement price, including a first settle price as defined by P1 or P2, then procedures will by used to determine the settlement price or the expiration in question.

E1. The settlement price is defined as the trading price at closing call, even if it does not have the minimum amount required (see Annex of Monthly Parameters) to be considered valid;

E2. If there are no trades at the closing call, the weighted average of the trades made that day up until the moment before the start of the closing call;

E3. If there is no previous expiration settlement price as defined by E1 or E2, the one-day variation of the immediate subsequent expiration in which the settlement price was defined by P1, P2, E1, or E2 is applied to the settlement price of the previous day of the contract in question;

E4. If there is a previous expiration settlement price as defined by E1 or E2 and a later expiration defined by P1, P2, E1, or E2, the settlement price is obtained by linearly interpolating the daily settlement price variation in relation to the immediately previous day (Equation 1.0), using the immediately previous expiration where the settlement price was defined by E1 or E2 and the immediately subsequent expiration where the settlement price was defined by P1, P2, E1, or E2 as pivots in the interpolation.

1.4 Futures on the Average Rate of One-Day Repurchase Agreements (OC1)

OC1 settlement price is expressed as an annualized interest rate and follows the same calculation procedures and parameters used for DI1 using section 1.1.

In the absence of closing call data that renders it impossible to perform the aforementioned procedures, the OC1 settlement price will be calculated using equation (1.10).

$$PA_{OC1_t^n} = PA_{DI1_t^n} + SPR_{Sel.CDI^t}^n \qquad (1.10)$$

Where:

$PA_{OC1_t^n}$ = settlement price for the nth OC1 expiration on date t, rounded to the third decimal place;

$PA_{DI1_t^n}$ = settlement price for nth DI1 expiration on date t.

$SPR_{Sel.CDI^t}^n$ = spread between the Selic and CDI rates for the nth expiration on date t.

The spread between the Selic and CDI rates for the expiration n is calculated using equation (1.11):

$$SPR_{sel.CDI^t}^n = \left(e^{LN(SPR_t^n)} - 1 \right) \times PA_{DI1_t^n} \qquad (1.11)$$

Where:

$PA_{DI1_t^n}$ = settlement price for nth DI1 expiration on date t.

$LN(SPR_t^n)$ = the logarithm of the spread between the Selic and CDI rates for the period corresponding to the nth expiration date on date t. The logarithm being the natural logarithm between the Selic and CDI rates using equation (1.12).

$$LN(SPR_t) = logn\left(\frac{Selic_t}{CDI_t} \right) \qquad (1.12)$$

The logarithm of the spread between the Selic and CDI rates for period DUn is determined by the random process with mean reversion, with the value calculated using equation (1.13):

$$LN(SPR_t^n) = LN(SPR_{t-1}) \times e^{-k \times DU_n} + \theta \times (1 - e^{-k \times DU_n}) \qquad (1.13)$$

The θ and k parameters are calculated using equations (1.14):

$$\theta = \frac{a}{1 - b}$$

$$k = -logn(b) \qquad (1.14)$$

27

where a and b are estimated from the linear regression of the logarithm of the spread on date t against the spread on date $t - 1$, considering a 63 business day window prior to the calculation date using equations (1.15).

$$a = \overline{LN(SPR_i)} - b \times \overline{LN(SPR_{i-1})}$$

$$b = \frac{\sum_{i=t-1}^{t-64}\left(LN(SPR_i) \times LN(SPR_{i-1})\right) - \frac{\left(\sum_{i=t-1}^{t-64} LN(SPR_i)\right) \times \left(\sum_{i=t-1}^{t-64} LN(SPR_{i-1})\right)}{63}}{\left(\sum_{i=t-1}^{t-64}\left(LN(SPR_{i-1})\right)^2\right) - \frac{\left(\sum_{i=t-1}^{t-64} LN(SPR_{i-1})\right)^2}{63}}$$

$$LN(SPR_i) = logn\left(\frac{Selic_i}{CDI_i}\right)$$

$$\overline{LN(SPR_i)} = \frac{\left(\sum_{i=t-1}^{t-64} LN(SPR_i)\right)}{63}$$

$$\overline{LN(SPR_{i-1})} = \frac{\left(\sum_{i=t-1}^{t-64} LN(SPR_{i-1})\right)}{63} \tag{1.15}$$

Where:

i = index for the dates of the 63 business day window prior to the calculation date;

$Selic_i$ = Selic rate published by the Central Bank of Brazil on the date i;

CDI_i = CDI rate published by B3 on the date i.

1.5 U.S. Dollar Spread Futures Contract Referencing One-Day Repurchase Agreements (DCO)

The DCO settlement price is expressed as an annualized interest rate and follows the same procedures and calculation parameters used for the DDI using section 1.2, considering (i) substituting DI1 settlement prices with the OC1 settlement prices of the same expiration date and (ii) the substitution of FRC settlement prices with FRA settlement prices based on one-day repurchase agreements

28

(FRO), presented in section 1.6, of the same expiration date, rounded to the third decimal place.

1.6 Forward Rate Agreement on One-Day Repurchase Agreements X U.S. Dollar Spread (FRO)

The settlement price for the Forward Rate Agreement (FRA) on One-Day Repurchase Agreements X U.S. Dollar Spread is expressed as an annualized interest rate and follows the same procedures and calculation parameters used for the FRC using section 1.3.

In the absence of closing call data that renders it impossible to perform the aforementioned procedures, the FRO settlement price will be calculated using equation (1.16):

$$PA_{FRO^n} = \left(Factor.PA_{FRC^n} \times \left(\frac{Factor.PA_{OC_1^n}}{Factor.PA_{OC_1^1}} \right) \times \left(\frac{Factor.PA_{DI_1^1}}{Factor.PA_{DI_1^n}} \right) - 1 \right) \times \frac{360 \times 100}{DC_n - DC_1}$$

(1.16)

Where:

PA_{FRO^n} =   settlement price for the nth FRO expiration, rounded to the second decimal place;

PA_{FRC^n} =   settlement price for the nth expiration of the FRC Contract;

$PA_{OC_1^1}$ = settlement price of the first OC1 expiration;

DC_n =   number of calendar days between the calculation date and the date of the nth FRO expiration;

DC_1 = number of calendar days between the calculation date and the date of the first FRO expiration;

$Factor.PA$ = capitalization factor of the respective contract settlement price for the expiration period calculated using equations (1.17).

$$Factor.PA_{FRC^n} = \left(1 + PA_{FRC^n} \times \frac{DC_n - DC_1}{360 \times 100}\right)$$

$$Factor.PA_{OC1^n} = \left(1 + \frac{PA_{OC1^n}}{100}\right)^{\frac{DU_n}{252}}$$

$$Factor.PA_{OC1^1} = \left(1 + \frac{PA_{OC1^1}}{100}\right)^{\frac{DU_1}{252}}$$

$$Factor.PA_{DI1^1} = \left(1 + \frac{PA_{DI1^1}}{100}\right)^{\frac{DU_1}{252}}$$

$$Factor.PA_{DI1^n} = \left(1 + \frac{PA_{DI1^n}}{100}\right)^{\frac{DU_n}{252}} \qquad (1.17)$$

Where:

PA_{FRO^n} = settlement price for the nth FRO expiration;

PA_{FRC^n} = settlement price for the nth FRC expiration;

PA_{OC1^1} = settlement price for the first OC1 expiration;

PA_{OC1^n} = settlement price for the nth OC1 expiration;

PA_{D1^1} = settlement price for the first DI1 expiration;

PA_{DI1^n} = settlement price for the nth DI1 expiration;

DU_n = number of trading days between the calculation date t and the date of the nth expiration of the contract;

DU_1 = number of trading days between the calculation date t and the first expiration of the contract;

DC_n = number of calendar days between the calculation date t and the date of the nth expiration of the contract;

DC_1 = number of calendar days between the calculation date and the date of the first expiration of the contract.

1.7 Extended Consumer Price Index (IPCA) Futures (IAP)

The IAP settlement price is expressed in UP points. It should be noted that the reference for this futures contract is the IPCA which is calculated and published by the Brazilian Institute of Geography and Statistics (IBGE).

IAP settlement prices are calculated using non-arbitrage formulas. It should be noted the calculation methodology of the first open expiration differs from the calculation methodology of other expirations on the last trading day and on the expiration date.

1.7.1 All Open Expirations

The settlement price for IAP expirations is given by equation (1.18):

$$PA_{IAP^n} = IPCA_{PRata,t} \times \frac{(1+RPre_{DI1}^n)^{\frac{DU_n}{252}}}{(1+CL_{IPCA^n})^{\frac{DU_n}{252}}} \tag{1.18}$$

Where:

PA_{IAP^n} = settlement price for the nth IAP expiration;

$IPCA_{PRata,t}$ = pro rata IPCA for the calculation date t, calculated using equation (1.19);

$RPre_{DI1}^n$ = pre-defined rate for the period of nth IAP expiration, calculated by exponential interpolation of DI1 settlement prices using equation (1.1);

CL_{IPCA^n} = real IPCA spread for the period of the nth expiration, calculated using equation (1.21);

DU_n = number of trading days between the calculation date and the expiration of the nth IAP expiration.

$$IPCA_{PRata,t} = IPCA_{15a} \times (1 + EIPCA_0)^{\frac{DU_{15a,t}}{DU_{15a,15p}}} \qquad (1.19)$$

Where:

$IPCA_{15a}$ = most recently published IPCA by IBGE falling before the 15th day of the month;

$EIPCA_0$ = IPCA projection published by Anbima or the inflation rate, if published;

$DU_{15a,15p}$ = trading days between the 15th day of the previous and following months to the calculation date t;

$DU_{15a,t}$ = trading days between the 15th day of the previous month and the calculation date t .

1.7.2 First open expiration on the expiration date

The settlement price for the first IAP expiration on the expiration date will be the value of the IPCA index number (number of points) published by IBGE for the reference month.

1.8 IPCA Inflation Coupon Futures Contract (DAP)

The DAP settlement price is expressed in PU points, rounded to the second decimal place.

Procedure sequence to determine the settlement price for a given DAP expiration.

P1. The settlement price will be the price established at the electronic closing call for the expiration in question based on **valid trades** (see the methodology in the **GENERAL PROVISIONS** chapter at the beginning of this manual), according to **the Quantity Limit** parameter stipulated in Table 6 of the *Monthly Parameters Annex*.

P2. If procedure P1 cannot be applied, the settlement price for the expiration in question will be the average price (Mid) of the valid bid and asks offers, with valid bid-ask spread, calculated according to the methodology of **Volume-Weighted Average Price at the End of the Closing Call** (see methodology in the **GENERAL PROVISIONS** chapter at the beginning of this manual) for this maturity, observing the **Quantity Limit** and **Spread Limit** parameters stipulated in Table 6 of the *Monthly Parameters Annex*.

P3. If procedure P2 cannot be applied, the settlement price as a rate for the expiration in question will be calculated using equation (1.20)

$$PA_{DAP^n} = \frac{100,000}{\left(1+PAT_{DAP^n}\right)^{\frac{DU_n}{252}}} \qquad (1.20)$$

Where PAT_{DAP^n} denotes the rate of the n-th DAP expiration, calculated as described in the topic "*Fallback DAP/IPCA Clean Coupon Methodology*" in "**Chapter 3.2 - DI X IPCA**" of the **"B3 Curves Manual"** ($DPL\_Fallback_{n,t}$), and adjusted by the valid offers of the Closing Call, which did not generate trades or Mid of bids, as described in the section *"Theoretical Pricing"*, in the **GENERAL PROVISIONS** section at the beginning of this document.

Regarding the *"Fallback DAP/IPCA Clean Coupon Methodology"*, it should be noted that, for future DAP maturities that coincide with the NTN-B maturity (government bonds indexed to inflation index IPCA), the future DAP adjusted rate (PAT_{DAP^n}) of the nth maturity date, will be marked using "IPCA Coupon Match" ($Casado_n$), adding to the NTN-B rate of the calculation date ($NTNB_n^{Anbima}$), it is

33

obtained at the close of the same calculation date, and disclosed by Anbima. The adjustment rate will be given according to the formula below:

$$PAT_{DAP^n} = NTNB_n^{Anbima} + Casado_n$$

The "IPCA Coupon Match" corresponds to the difference between the IPCA coupon futures coupon rate (DAP_n) and the IPCA government bond coupon ($NTNB_n$) for the same term n, and is given as follows:

$$Casado_n = DAP_n - NTNB_n$$

The "IPCA Coupon Match" information for the maturities ($Casado_n$), will be captured through the Pool of Informants, collected on the same calculation date, provided that for the capture, the parameters of **Minimum Number of Informants** and **Trading Volume** of the Table 6 of the *Monthly Parameters Annex*.

a) When the information meets the above parameters, it will be consolidated by maturity, using the average of each informant i among the M informants.

b) In the event that only some maturities meet the above parameters (**updated maturities** - $Casado_i$), and other maturities do not meet (**non-updated maturities** - $Casado_n$), the non-updated maturities ($Casado_n$) will be obtained from of updated maturities ($Casado_i$), considering:

- the Flat Forward interpolation, if there is a $Casado_i$ with a deadline (DU_i in working days) shorter than the maturity of the interpolated $Casado_n$ (DU_n in working days), **AND** information $Casado_j$ with deadline (DU_j in working days) greater than the interpolated deadline (DU_n in working days), both obtained with information collected as described in the paragraph

34

above. Both $Casado_i$ and $Casado_j$, to be used, will be the closest in term, before and after $Casado_n$:

$$Casado_n = \left(\left(\left(1+\frac{Casado_i}{100}\right)^{\frac{DU_i}{252}} * \left(\frac{\left(1+\frac{Casado_j}{100}\right)^{\left(\frac{DU_j}{252}\right)}}{\left(1+\frac{Casado_i}{100}\right)^{\left(\frac{DU_i}{252}\right)}}\right)^{\left(\frac{DU_n-DU_i}{DU_j-DU_i}\right)}\right)^{\left(\frac{252}{DU_n}\right)} - 1\right) * 100$$

- otherwise, the repetition of $CasadoIPCA_n$ will be used for the closest deadline, obtained as described in the paragraph above, with earlier OR later deadlines according to the case:
  - If there is no $Casado_i$ information with term (DU_i in working days) shorter than the interpolated term (DU_n in working days), obtained as described in the paragraph above. Then we will obtain the $Casado_n$ according to the formula below, where $Casado_j$ is obtained as described in the paragraph above:

  $$Casado_n = Casado_j$$

  - If there is no $Casado_j$ information with term (DU_j in working days) greater than the interpolated term (DU_n in working days), obtained as described in the paragraph above. Then we will obtain the $Casado_n$ according to the formula below, where $Casado_i$ is obtained as described in the paragraph above:

  $$Casado_n = Casado_i$$

c) If any maturity date is met, the "IPCA Coupon Match" will be considered the one obtained at the close of the DAP on the previous day ($Casado_{n,t-1}^{B3}$):

$$Casado_{n,t} = Casado_{n,t-1}^{B3} = DAP_{n,t-1}^{Closing} - NTNB_{n,t-1}^{Anbima}$$

Where:

$DAP_{n,t-1}^{Closing}$ is the closing yield of the future contract DAP, obtained at the close of the previous trading day;

$NTNB_{n,t-1}^{Anbima}$ is the NTN-B rate, obtained at the close of the previous trading day, and published by Anbima.

2   FOREIGN EXCHANGE

2.1   U.S. Dollar Futures Contract (DOL) and Mini U.S. Dollar Futures Contract (WDO)

The U.S. Dollar Futures Contract and Mini U.S. Dollar Futures Contract settlement prices are expressed in Brazilian Reals per USD1,000.00, rounded to the third decimal place.

DOL settlement prices are calculated using non-arbitrage formulas. The methodology for calculating the first open expiration differs from other expirations. In the two-day period preceding the expiration date of the first open expiration, the methodology of the second expiration is not uniform due to the rollover of the FRC short leg and the rollover of the DOL from the first to the second expiration.

WDO settlement prices are the settlement prices for the respective DOL expirations.

2.1.1   First open expiration

The settlement price for the first DOL expiration is the weighted arithmetic average of the trades between 3:50-4:00 pm on the calculation date, rounded to the third decimal place.

2.1.2   Other expirations

The settlement prices for other DOL expirations are calculated using equation (2.1):

$$PA_{DOL_t^n} = DOLPtax_{t-1} \times \frac{\left(1 + \frac{PA_{DI1_t^n}}{100}\right)^{\frac{DU_n}{252}}}{\left(1 + PA_{DDI_t^n} \times \frac{DC_n}{36.000}\right)} \quad (2.1)$$

Where:

$PA_{DOL_t^n}$ = settlement price for the nth DOL expiration on date t, rounded to the third decimal place;

$PA_{DI1_t^n}$ = settlement price for the nth DI1 expiration on the date t;

$PA_{DDI_t^n}$ = settlement price for the nth DDI expiration on the date t;

$DOLPtax_{t-1}$ = Brazilian Real per U.S. Dollar exchange selling rate using PTAX800, published by the Central Bank of Brazil on the date $t - 1$;

DU_n = the number of trading days between the calculation date t and the date of the nth DI1 expiration;

DC_n = the number of calendar days between the calculation date t and the calculation date of the nth DDI expiration.

When there is a DOL expiration that does not correspond to the DI1 and/or DDI, the settlement prices necessary to calculate the DOL settlement price using equation (2.1) will be calculated by interpolation, using equations (1.1) and (1.8), respectively.

2.1.3   Second open expiration

The second open DOL expiration will have its settlement price calculated differently than stipulated in the previous section, on the dates described below.

Business day preceding the last trading day of the first open expiration.

The settlement price for the second DOL open expiration is calculated using equation (2.2):

$$PA_{DOL^2} = PA_{DOL^1} + DR1_{DOL}^{1,2} \quad (2.2)$$

38

Where:

PA_{DOL^2} = settlement price for the second DOL expiration, rounded to the third decimal place;

PA_{DOL^1} = settlement price for the first DOL expiration;

$DR1_{DOL}^{1.2}$ = weighted arithmetic average of U.S. Dollar Rollover Structured Transaction (DR1) first and second open expiration trades carried out between 3:50-4:00 pm on the calculation date.

Last trading day of the first open expiration

> The settlement price for the second open DOL expiration is the weighted arithmetic average of the trades carried out between 3:50-4:00 pm on the calculation date.

2.2 U.S. Dollar Swap with Reset Referencing One-Day Repurchase Agreement (SCS)

The U.S. Dollar Swap with Reset Referencing One-Day Repurchase Agreement settlement price is expressed as an annualized interest rate and follows the same procedures and calculation parameters used for the DCO, using section 1.2, of the same expiration date.

Due to the particularities of the U.S. Dollar Swap with Reset Referencing OneDay Repurchase Agreement, where the spread rates of a given expiration depend on the participant's total position in that expiration, among others, the settlement calculation is done for each participant from their positions and not in a standardized way, as in futures contracts. Each participant's positions are reset daily using equation (2.3):

$$PA_t^n = \left[CC_t - \frac{VF}{1 + i_s \times \frac{DCn}{360 \times 100}} \right] \times DOLPtax_{t-1} \times (1 + Selic_t)^{\frac{1}{252}} \qquad (2.3)$$

39

Where:

PA_t^n = settlement value of the position of the nth expiration on date t;

CC_t = spread rate for the day's updated position (the day's net position consolidated with the previous day's position and updated for the day), corresponding to the respective series on date t;

VF = value of the FInal Value leg;

CD_n = number of calendar days between the calculation date t and the date of the nth SCS position expiration;

i_s = B3 reference rate for Selic x U.S. Dollar transactions, which correspond to the DCO settlement price with the same expiration date. When said expiration is absent in the DCO, the reference rate will be calculated by interpolating the DCO settlement prices. The interpolation is explained in equation (1.8);

$DOLPtax_{t-1}$ = Brazilian Real per U.S. Dollar exchange selling rate using PTAX800, published by the Central Bank of Brazil on the date $t - 1$;

$Selic_t$ = Selic rate published by the Central Bank of Brazil on the date t.

A full description of SCS variables and their daily updates is available at www.bmfbovespa.com.br, Products, Interest Rates, OC1 x U.S. Dollar Spread, Swap.

2.3 Australian Dollar Futures Contract (AUD)

The settlement price for the Australian Dollar Futures Contract is expressed in Brazilian Reals per AUD1,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

AUD settlement prices are calculated using non-arbitrage formulas. The methodology for calculating the first open expiration differs from other expirations on the last trading day and on the expiration date.

2.3.1 All open expirations

The AUD settlement price is calculated using equation (2.4):

$$PA_{AUD^n} = BRL/USD_{cl}^s \times USD/AUD^s \times \frac{\left(1 + \frac{PA_{DI1}n}{100}\right)^{\frac{DU_n}{252}}}{\left(1 + CL_{BRL/AUD}^n \times \frac{DC_n}{360 \times 100}\right)} \times 1.000 \qquad (2.4)$$

Where:

PA_{AUD^n} = AUD settlement price for the nth expiration, rounded to the third decimal place;

BRL/USD_{cl}^s = Brazilian Reals (BRL) per U.S. Dollar (USD) exchange rate, real rate, spot price, calculated by B3 at 4:00 pm;

USD/AUD^s = U.S Dollar per Australian Dollar exchange rate, spot price, calculated by B3 at 4:00 pm;

PA_{DI1^n} = settlement price for the nth DI1 expiration;

DU_n = number of trading days between the calculation date and the date of the nth expiration of the contract;

DC_n = number of calendar days between the calculation date and the date of the nth expiration of the contract;

$CL_{BRL/AUD}^n$ = real Brazilian Real x Australian Dollar spread rate for the nth expiration calculated using equation (2.5).

41

$$CL_{\frac{BRL}{AUD}}^n = \left[\left(1 + CL_{\frac{BRL}{USD}}^n \times \frac{DC_n}{360 \times 100}\right) \times \left(1 + SAU_{\frac{AUD}{USD}}^n \times \frac{DC_n}{360 \times 100}\right) - 1\right] \times \frac{360 \times 100}{DC_n}$$

(2.5)

Where:

$CL_{BRL/USD}^n$ = real U.S. Dollar spread rate for the nth expiration, expressed as an annual linear percentage based on a 360-day calendar, calculated according to equation (2.6);

$SAU_{AUD/USD}^n$ = Interest rate spread denominated in U.S. Dollar and Australian Dollar for the term corresponding to the nth expiration, expressed as an annual linear percentage based on a 360-day calendar, calculated according to equation (2.7).

$$CL_{BRL/USD}^n = \left[\left(1 + SP_{DDI^n} \times \frac{DC_n}{360 \times 100}\right) \times \left(\frac{BRL/USD_{cl,t}^S}{DOLPtax_{t-1}}\right) - 1\right] \times \frac{360 \times 100}{DC_n} \qquad (2.6)$$

Where:

SP_{DDI^n} = settlement price for the nth DDI expiration;

CD_n = number of calendar days between the calculation date and the date of the nth expiration of the contract;

$BRL/USD_{cl,t}^s$ = Brazilian Reals per U.S. Dollar exchange rate, real spread, spot rate, calculated by B3 at 4:00 pm;

$DOLPtax_{t-1}$ = Brazilian Real per U.S. Dollar exchange selling rate using PTAX800, published by the Central Bank of Brazil on the date $t-1$;

$$SAU_{AUD/USD}^n = R_{AUD} - R_{USD} \text{ (2.7)}$$

Where:

R_{AUD} =Interest rate denominated in Australian Dollar, expressed as an annual linear percentage based on a 360-day calendar year, calculated by B3 at 4:00 pm;

R_{USD} = Interest rate denominated in U.S. Dollar, expressed as an annual linear percentage based on a 360-day calendar year, calculated by B3 at 4:00 pm;.

When there is a AUD expiration that does not correspond to the DI1 and/or DDI, the settlement prices necessary to calculate the AUD settlement price using equation (2.4) and (2.6), will be calculated by interpolation, using equations (1.1) and (1.8), respectively.

2.3.2 First open expiration on the last trading day

On the last trading day of the expiration, the settlement price will be calculated according to equation (2.8):

$$SP_{AUD}^{liq} = TP_t \times TD_t \times 1.000 \ (2.8)$$

Where:

SP_{AUD}^{liq} = AUD settlement price;

TP_t = U.S. Dollars per Australian Dollar exchange rate as calculated by The World Markets Company PLC ("WM") and published by Reuters Limited ("Reuters") on its WMRSPOT02 page, WM/Reuters Closing Spot Rate, on the calculation date t. If the rate is unavailable due to foreign holiday will be used the rate of the date $t-1$;

TD_t = Brazilian Reals per U.S. Dollar exchange selling rate, published by the Central Bank of Brazil through Sisbacen, transaction PTAX800, option "5", closing price, for settlement in two days, on calculation date *t.*

2.3.3 First open expiration on the expiration date

On the expiration date, the settlement price will be the settlement price calculated on the last trading day according to subsection 2.3.2.

2.4 Canadian Dollar Futures (CAD)

The settlement price for the Canadian Dollar Futures Contract is expressed in Brazilian Reals per CAD1,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

CAD settlement prices are calculated using the same equations for AUD presented in section 2.3, considering the adjustments to the settlement price calculation equations (2.4) and (2.8) necessary due to the inverse parity of the U.S. Dollars per Canadian Dollar exchange rate.

2.4.1 All open expirations

The CAD settlement price is calculated according to equation (2.9):

$$PA_{CAD^n} = \frac{BRL/USD^s_{cl}}{CAD/USD^s} \times \frac{\left(1+\frac{PA_{DI1^n}}{100}\right)^{\frac{DU_n}{252}}}{\left(1+CL^n_{BRL/CAD}\times\frac{DC_n}{360\times100}\right)} \times 1.000 \qquad (2.9)$$

Where:

PA_{CAD^n} = CAD settlement price for the nth expiration, rounded to the third decimal place;

BRL/USD^s_{cl} = Brazilian Reals per U.S. Dollar exchange rate, real spread, spot rate, calculated by B3 at 4:00 pm;

CAD/USD^s = Canadian Dollars per U.S. Dollar exchange rate, spot rate, calculated by B3 at 4:00 pm;

PA_{DI1^n} = settlement price for the nth DI1 expiration;

44

DU_n = number of trading days between the calculation date and the date of the nth expiration of the contract;

DC_n = number of calendar days between the calculation date and the date of the nth expiration of the contract;

n$CL_{BRL/CAD}^n$ = real Brazilian Real x Canadian Dollar spread rate for the nth expiration, calculated using equation (2.10).

$$CL_{BRL/CAD}^n = \left[\left(1 + CL_{BRL/USD}^n \times \frac{DC_n}{360 \times 100}\right) \times \left(1 + SAU_{CAD/USD}^n \times \frac{DC_n}{360 \times 100}\right) - 1\right] \times \frac{360 \times 100}{DC_n} \quad (2.10)$$

Where:

$CL_{BRL/USD}^n$ = real U.S. Dollar spread rate for the nth expiration, expressed as an annual linear percentage based on a 360-day calendar, calculated according to equation (2.6);

$SAU_{CAD/USD}^n$ = Interest rate spread denominated in U.S. Dollar and Canadian Dollar for the term corresponding to the nth expiration, expressed as an annual linear percentage based on a 360-day calendar, calculated according to equation (2.11).

$$SAU_{CAD/USD}^n = R_{CAD} - R_{USD} \quad (2.11)$$

Where:

R_{CAD} = Interest rate denominated in Canadian Dollar, expressed as an annual linear percentage based on a 360-day calendar, calculated by B3 at 4:00 pm;

R_{USD} = Interest rate denominated in U.S. Dollar, expressed as an annual linear percentage based on a 360-day calendar, calculated by B3 at 4:00 pm.

When there is a CAD expiration that does not correspond to the DI1 and/or DDI, the settlement prices necessary to calculate the DOL settlement price using equation (2.9) and(2.6) will be calculated by interpolation, using equations (1.1) and (1.8), respectively.

2.4.2 First open expiration on the last trading day

On the last trading day of the expiration, the settlement price will be calculated according to equation (2.12):

$$SP_{CAD}^{liq} = \frac{TD_t}{TP_t} \times 1.000 \qquad (2.12)$$

Where:

SP_{CAD}^{liq} = the CAD settlement price;

TP_t = U.S. Dollars per Canadian Dollar exchange rate as calculated by The World Markets Company PLC ("WM") and published by Reuters Limited ("Reuters") on its WMRSPOT02 page, WM/Reuters Closing Spot Rate, on the calculation date t. If the rate is unavailable due to foreign holiday will be used the rate of the date $t - 1$;

TD_t = Brazilian Reals per U.S. Dollar exchange selling rate, published by the Central Bank of Brazil through Sisbacen, transaction PTAX800, option "5", closing price, for settlement in two days, on calculation date *t.*

2.4.3 First open expiration on the expiration date

The expiration date settlement price will be the settlement price calculated on the last trading day according to subsection 2.4.2.

2.5 New Zealand Dollar Futures (NZD)

The settlement price for the New Zealand Dollar Futures Contract is expressed in Brazilian Reals per NZD1,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

NZD settlement prices are calculated using the same equations for AUD presented in section 2.3, considering the adjustments to the real New Zealand Dollar spread calculation according to equation (2.5) due to the forward exchange rates for calculating the spread between currencies.

2.5.1 All open expirations

The NZD settlement price is calculated using equation (2.13):

$$PA_{NZD^n} = BRL/USD_{cl}^{S} \times USD/NZD^{S} \times \frac{\left(1+\frac{PA_{DI1^n}}{100}\right)^{\frac{DU_n}{252}}}{\left(1+CL_{BRL/NZD}^{n} \times \frac{DC_n}{360 \times 100}\right)} \times 1.000 \qquad (2.13)$$

Where:

PA_{NZD^n} = NZD settlement price for the nth expiration, rounded to the third decimal place;

BRL/USD_{cl}^{S} = Brazilian Reals per U.S. Dollar exchange rate, real spread, spot rate, calculated by B3 at 4:00 pm;

USD/NZD^{S} = U.S. Dollars per New Zealand Dollar exchange rate, real spread, spot rate, calculated by B3 at 4:00 pm;

PA_{DI1^n} = settlement price for nth DI1 expiration;

DU_n = number of trading days between the calculation date and the date of the nth expiration of the contract;

DC_n = number of calendar days between the calculation date and the date of the nth expiration of the contract;

47

$CL_{BRL/NZD}^{n}$ = real Brazilian Real x New Zealand Dollar spread rate for the nth expiration calculated using equation (2.14).

$$CL_{BRL/NZD}^{n} = \lfloor \left(1 + CL_{BRL/USD}^{n} \times \frac{DC_n}{360 \times 100}\right) \times VC_{USD/NZD}^{n} - 1 \rfloor \times \frac{360 \times 100}{DC_n} \qquad (2.14)$$

Where:

$CL_{BRL/USD}^{n}$ = real U.S. Dollar spread rate for the nth expiration, expressed as an annual linear percentage based on a 360-day calendar, calculated according to equation (2.6);

$VC_{USD/NZD}^{n}$ = U.S. Dollars per New Zealand Dollar expected exchange rate variation for the nth expiration, calculated according to equation (2.15).

$$VC_{USD/NZD}^{n} = \frac{USD/NZD^{s}}{USD/NZD_{n}^{f}} \qquad (2.15)$$

Where:

USD/NZD^{s} = U.S. Dollars per New Zealand Dollar exchange rate, spot rate, calculated by B3 at 4:00 pm;

USD/NZD_{n}^{f} = U.S. Dollars per New Zealand Dollar exchange rate, forward rate for the nth expiration, calculated by B3 at 4:00 pm.

When there is a NZD expiration that does not correspond to the DI1 and/or DDI, the settlement prices necessary to calculate the DOL settlement price using equation (2.13) and (2.6) will be calculated by interpolation, using equations (1.1) and (1.8), respectively.

2.5.2 First open expiration on the last trading day

On the last trading day of the expiration, the settlement price will be calculated according to equation (2.16):

$$PA_{NZD}^{liq} = TP_t \times TD_t \times 1.000 \qquad (2.16)$$

Where:

PA_{NZD}^{liq} = NZD settlement price;

TP_t = U.S. Dollars per New Zealand Dollar exchange rate as calculated by The World Markets Company PLC ("WM") and published by Reuters Limited ("Reuters") on its WMRSPOT02 page, WM/Reuters Closing Spot Rate, on the calculation date t. If the rate is unavailable due to foreign holiday will be used the rate of the date $t - 1$;

TD_t = Brazilian Reals per U.S. Dollar exchange rate of, closing offered quotation, published by the Central Bank of Brazil through Sisbacen, transaction PTAX800, option "5", closing price, for settlement in two days, on calculation date t.

2.5.3 First open expiration on the expiration date

On the expiration date, the settlement price will be calculated on the last trading day according to subsection 2.5.2.

2.6 Euro Futures (EUR) and Mini Euro Futures (WEU)

The settlement prices for Euro Futures and Mini Euro Futures are expressed in Brazilian Reals per EUR1,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

EUR settlement prices are calculated from the same equations used for AUD presented in section 2.3, where Australian Dollar variables are replaced with equivalent Euro variables.

WEU settlement prices are the settlement prices of the respective EUR expirations.

2.7 Swiss Franc Futures Contract (CHF)

The settlement price for the Swiss Franc Futures Contract is expressed in Brazilian Reals per CHF1,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

CHF settlement prices are calculated from the same equations used for CAD presented in section 2.4, considering the adjustments to equations (2.10) and (2.11) due to the use of forward exchange rates for calculating the spread between currencies.

2.7.1 All open expirations

CHF settlement price is calculated according to equation (2.17):

$$PA_{CHF^n} = \frac{BRL/USD_{cl}^S}{CHF/USD^S} \times \frac{\left(1+\frac{PA_{DI1^n}}{100}\right)^{\frac{DU_n}{252}}}{\left(1+CL_{BRL/CHF}^n \times \frac{DC_n}{360\times100}\right)} \times 1.000 \qquad (2.17)$$

Where:

PA_{CHF^n} = CHF settlement price for the nth expiration, rounded to the third decimal place;

BRL/USD_{cl}^S = Brazilian Reals per U.S. Dollar exchange rate, real spread, spot rate, calculated by B3 at 4:00 pm;

CHF/USD^S = Swiss Francs per U.S. Dollar exchange rate, spot rate, calculated by B3 at 4:00 pm;

PA_{DI1^n} = the settlement price for the nth DI1 expiration;

DU_n = number of trading days between the calculation date and the date of the nth expiration of the contract;

DC_n = number of calendar days between the calculation date and the date of the nth expiration of the contract;

50

$CL^n_{BRL/CHF}$ = real Brazilian Real x Swiss Franc spread rate for the nth expiration, calculated using equation (2.18).

$$CL^n_{BRL/CHF} = \left[\left(1 + CL^n_{BRL/USD} \times \frac{DC_n}{360 \times 100}\right) \times VC^n_{USD/CHF} - 1\right] \times \frac{360 \times 100}{DC_n} \qquad (2.18)$$

Where:

$CL^n_{BRL/USD}$ = real U.S. Dollar spread rate for the nth expiration, expressed as an annual linear percentage based on a 360-day calendar, calculated according to equation (2.6);

$VC^n_{USD/CHF}$ = U.S. Dollars per Swiss Francs expected exchange rate variation for the nth expiration, calculated according to equation (2.19).

$$VC^n_{USD/CHF} = \frac{USD/CHF^f_n}{USD/CHF^s} \qquad (2.19)$$

Where:

USD/CHF^s = U.S. Dollars per Swiss Franc exchange, spot rate, calculated by B3 at 4:00 pm;

USD/CHF^f_n = U.S. Dollars per Swiss Franc exchange rate, forward rate for the nth expiration, calculated by B3 at 4:00 pm.

When there is a CHF expiration that does not correspond to the DI1 and/or DDI, the settlement prices necessary to calculate the CHF settlement price using equation (2.17) and (2.6) will be calculated by interpolation, using equations (1.1) and (1.8), respectively.

2.7.2 First open expiration on the last trading day

On the last trading day of the expiration, the settlement price will be calculated using equation (2.20):

51

$$PA_{CHF}^{liq} = \frac{TD_t}{TP_t} \times 1.000 \ (2.20)$$

Where:

PA_{CHF}^{liq} = CHF settlement price;

TP_t = U.S. Dollars per Swiss Franc exchange rate as calculated by The World Markets Company PLC ("WM") and published by Reuters Limited ("Reuters") on its WMRSPOT02 page, WM/Reuters Closing Spot Rate, on the calculation date t. If the rate is unavailable due to foreign holiday will be used the rate of the date $t-1$;

TD_t = Brazilian Reals per U.S. Dollar exchange selling rate, published by the Central Bank of Brazil through Sisbacen, transaction PTAX800, option "5", closing price, for settlement in two days, on calculation date $t.$

2.7.3   First open expiration on the expiration date

On the expiration date, the settlement price will be the settlement price calculated on the last trading day according to subsection 2.7.2.

2.8 Yen Futures (JPY)

The settlement price for Yen Futures is expressed in Brazilian Reals per JPY100,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

JPY settlement prices are calculated from the same equations used for CAD presented in section 2.4, where Canadian dollar variables are replaced with equivalent yen variables and the 1,000 factor is changed to 100,000 in equation (2.9).

2.9 Yuan Futures (CNY)

The settlement price for the Yuan Futures Contract is expressed in Brazilian Reals per CNY 10,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

CNY settlement prices are calculated from the same equations used for CHF presented in section 2.7, where swiss franc variables are replaced with equivalent yuan variables and the 1,000 factor is changed to 10,000 in equation (2.17).

2.10 Pound Sterling Futures (GBP)

The settlement price for the Pound Sterling Futures Contract is expressed in Brazilian Reals per GBP 1,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

GBP settlement prices are calculated from the same equations used for AUD presented in section 2.3, where Australian dollar variables are replaced with equivalent pound sterling variables.

2.11 Turkish Lira Futures (TRY)

The settlement price for the Turkish Lira Futures Contract is expressed in Brazilian Reals per TRY 1,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

TRY settlement prices are calculated from the same equations used for CHF presented in section 2.7, where swiss franc variables are replaced with equivalent Turkish lira variables.

2.12 Argentine Peso Futures (ARB)

The settlement price for the Argentine Peso Futures Contract is expressed in Brazilian Reals per ARB1,000,000. The price is disclosed to three decimal places, rounded to the third decimal place.

ARB settlement prices are calculated from the same equations used for CHF presented in section 2.7, where swiss franc variables are replaced with equivalent argentine peso variables and the 1,000 factor is changed to 1,000,000 in equation (2.17). rounded to the third decimal place.

2.13 Chilean Peso Futures (CLP)

The settlement price for the Chilean Peso Futures Contract is expressed in Brazilian Reals per CLP1,000,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

CLP settlement prices are calculated from the same equations used for CHF presented in section 2.7, where swiss franc variables are replaced with equivalent Chilean peso variables and the 1,000 factor is changed to 1,000,000 in equation (2.17).

2.14 Mexican Peso Futures (MXN)

The settlement price for the Mexican Peso Futures Contract is expressed in Brazilian Reals per MXN10,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

MXN settlement prices are calculated from the same equations used for CAD presented in section 2.4, where Canadian dollar variables are replaced with equivalent Mexican peso variables and the 1,000 factor is changed to 10,000 in equation (2.9).

2.15 South African Rand Futures (ZAR)

The settlement price for the South African Rand Futures Contract is expressed in Brazilian Reals per ZAR10,000.00. The price is disclosed to three decimal places, rounded to the third decimal place.

ZAR settlement prices are calculated from the same equations used for CHF presented in section 2.7, where swiss franc variables are replaced with equivalent South African rand variables and the 1,000 factor is changed to 10,000 in equation (2.17).

2.16 U.S. Dollar per Euro Futures (EUP)

The settlement price for the U.S. Dollar per Euro Futures Contract is expressed in American Dollars per EUR1,000 to 3 decimal places. The price is disclosed to three decimal places, rounded to the third decimal place.

2.16.1   All Open Expirations

The EUP settlement price is the reference price of the *FX Forward Swap* contract for the expiration at 4:00pm calculated from the *WM Reuters/Refinitiv*. If the price is unavailable due to foreign holiday will be used the price from the date $t - 1$.

2.16.2 First open expiration on the last trading day

On the last trading day of the expiration, the settlement price will be calculated using equation (2.21):

$$PA_{EUP}^{liq} = TP_t \times 1.000 \qquad (2.21)$$

Where:

PA_{EUP}^{liq} = EUP settlement price, rounded to the third decimal place;

TP_t = U.S. Dollars per Euro exchange rate as calculated by The World Markets Company PLC ("WM") and published by Reuters Limited ("Reuters") on its

55

WMRSPOT02 page, WM/Reuters Closing Spot Rate, on the calculation date t. If the rate is unavailable due to foreign holiday will be used the rate of the date $t - 1$;

2.16.3 First open expiration on the expiration date

On the expiration date, the settlement price will be the settlement price calculated on the last trading day according to subsection 2.16.2.

2.17 U.S. Dollar per New Zealand Dollar Futures (NZL)

The settlement price for the U.S. Dollar per New Zealand Dollar Futures Contract is expressed in American Dollars per NZD1,000 to 3 decimal places.

NZD settlement prices are calculated from the same equations used for EUP presented in section 2.15, where Euro variables are replaced with equivalent New Zealand Dollar variables in equation (2.21), rounded to the third decimal place.

2.18 U.S. Dollar per Australian Dollar Futures (AUS)

The settlement price for the U.S. Dollar per Australian Dollar Futures Contract is expressed in American Dollars per AUD1,000 to 3 decimal places.

AUS settlement prices are calculated from the same equations used for EUP presented in section 2.16, where euro variables are replaced with equivalent Australian dollar variables in equation (2.21), rounded to the third decimal place.

2.19 U.S. Dollar per British Pounds Sterling (GBR)

The settlement price for the U.S. Dollar per British Pounds Sterling Futures Contract is expressed in American Dollars per GBP1,000 to 3 decimal places.

GBR settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent

British Pounds Sterling variables in equation (2.21), rounded to the third decimal place.

2.20 Chinese Yuan per U.S. Dollar Futures (CNH)

The settlement price for the Chinese Yuan per U.S. Dollar Futures Contract is expressed in Chinese Yuan per USD1,000 to 3 decimal places.

CNH settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Chinese Yuan variables in equation (2.21), rounded to the third decimal place.

2.21 Swiss Franc per U.S. Dollar Futures (SWI)

The settlement price for the Swiss Franc per U.S. Dollar Futures Contract is expressed in Swiss Franc per USD1,000 to 3 decimal places.

SWI settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Swiss Franc variables in equation (2.21), rounded to the third decimal place.

2.22 Argentine Peso per U.S Dollar Futures (ARS)

The settlement price for the Argentine Peso per U.S. Dollar Futures Contract is expressed in Argentine Peso per USD1,000 to 3 decimal places.

ARS settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Argentine Peso variables in equation (2.21). The exchange rate for the Argentine Peso per U.S. Dollar Futures Contract is calculated and published by the ARS MAE.

2.23 Peso Chilean Peso per U.S Dollar Futures (CHL)

The settlement price for the Chilean Peso per U.S. Dollar Futures Contract is expressed in Chilean Peso per USD1,000 to 3 decimal places.

CHL settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Chilean Peso variables in equation (2.21), rounded to the third decimal place. The exchange rate for the Chilean Peso per U.S. Dollar Futures Contract is calculated and published by the Central Bank of Chile.

2.24 Japanese Yen per U.S Dollar Futures (JAP)

The settlement price for the Japanese Yen per U.S. Dollar Futures Contract is expressed in Japanese Yen per USD1,000 to 3 decimal places.

JAP settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Japanese Yen variables in equation (2.21), rounded to the third decimal place.

2.25 Mexican Peso per U.S Dollar Futures (MEX)

The settlement price for the Mexican Peso per U.S. Dollar Futures Contract is expressed in Mexican Peso per USD1,000 to 3 decimal places.

MEX settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Mexican Peso variables in equation (2.21), rounded to the third decimal place.

2.26 Norwegian Krone per U.S Dollar Futures (NOK)

The settlement price for the Norwegian Krone per U.S. Dollar Futures Contract is expressed in Norwegain Krone per USD1,000 to 3 decimal places.

NOK settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Norwegian Krone variables in equation (2.21), rounded to the third decimal place.

2.27 Canadian Dollar per U.S Dollar Futures (CAN)

The settlement price for the Canadian Dollar per U.S. Dollar Futures Contract is expressed in Canadian Dollar per USD1,000 to 3 decimal places.

CAN settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Canadian Dollar variables in equation (2.21), rounded to the third decimal place.

2.28 Russian Ruble per U.S Dollar Futures (RUB)

The settlement price for the Russian Ruble per U.S. Dollar Futures Contract is expressed in Russian Ruble per USD1,000 to 3 decimal places.

RUB settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Russian Ruble variables in equation (2.21), rounded to the third decimal place.

2.29 Swedish Krona per U.S Dollar Futures (SEK)

The settlement price for the Swedish Krona per U.S. Dollar Futures Contract is expressed in Swedish Krona per USD1,000 to 3 decimal places.

SEK settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Swedish krona variables in equation (2.21), rounded to the third decimal place.

2.30 Turkish Lira per U.S Dollar Futures (TUQ)

The settlement price for the Turkish Lira per U.S. Dollar Futures Contract is expressed in Turkish Lira per USD1,000 to 3 decimal places.

TUQ settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent Turkish lira variables in equation (2.21), rounded to the third decimal place.

2.31 South African Rand per U.S Dollar Futures (AFS)

The settlement price for the South African Rand per U.S. Dollar Futures Contract is expressed in South African Rand per USD1,000 to 3 decimal places.

AFS settlement prices are calculated from the same equations used EUP presented in section 2.16, where euro variables are replaced with equivalent south African rand variables in equation (2.21), rounded to the third decimal place.

3   EQUITIES

3.1 Ibovespa Futures (IND) and Mini Ibovespa Futures (WIN)

The settlement prices for the Ibovespa Futures Contract (or Bovespa Index) and for the Mini Ibovespa Futures Contract are expressed as index point values in Brazilian Reals, each point BRL1.00.

IND settlement prices are calculated using non-arbitrage formulas. It should be noted that the calculation methodology of the first open expiration differs from the methodology for calculating other expirations. On the expiration date of the first open expiration, the methodology for calculating all expirations will also be different.

WIN settlement prices are the settlement prices of the respective IND expirations.

3.1.1 First open expiration

The settlement price for the first IND expiration is the weighted arithmetic average of the trades carried out for that month, in the time interval according to the parameters of Table 9 of the Annex of Monthly Parameters of the calculation date.

3.1.2 Reference price for the Structure Ibovespa rollover transaction (IR1)

The IR1 reference price will be used as an input for calculating the settlement price for other IND expirations because the IR1 has greater liquidity than the long IND expirations that compose the IR1 transaction.
The rollover transaction has no settlement price, but the spread between the two IND expirations, that compose the transaction, provides a reference price.

Procedure Sequence to determine the IR1 reference price

The reference price resulting from any procedure will respect valid order prices.

P1. The reference price will be the price established at the electronic closing call for the expiration in question.

61

P2. If procedure P1 cannot be applied, the reference price for the expiration in question will be the average **valid bid prices** and **valid ask prices** with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 3 of the Monthly Parameters Annex.

P3. If procedure P2 cannot be applied, the expiration in question will have no reference price

3.1.3 Other Expirations

Procedure sequence to determine the settlement price for other IND expirations

P1. If the IR1 for the IND expiration has a reference price, the corresponding settlement price will be given according to equation (3.1) by the sum of (i) the settlement price for the first expiration and (ii) the IR1 reference price:

$$PA_{IND^n} = PA_{IND^1} + PRef_{IR1}^{1.n} \qquad (3.1)$$

Where:

PA_{IND^n} = settlement price for the $n$the IND expiration, rounded to the zero decimal place;

PA_{IND^1} = settlement price for the first IND expiration; and

$PRef_{IR1}^{1.n}$ = IR1 reference price from the first to the nth expiration.

P2. If the IR1 relevant to the IND expiration has no reference price, the corresponding settlement price will be calculated according to equation (3.2), based on (i) the settlement price for the first expiration, (ii) the fixed interest rate, and (iii) the cost of carry:

$$PA_{IND^n} = PA_{IND^1} \times \frac{\left(1+\frac{RPre_{DI1}^{INDn}}{100}\right)^{\frac{DU_{INDn}}{252}} \times \left(1+\frac{RPre_{DI1}^{IND1}}{100}\right)^{\frac{-DU_{IND1}}{252}}}{\left(1+CC_{INDj}\right)^{\frac{DU_{INDn}-DU_{IND1}}{252}}} \qquad (3.2)$$

62

Where:

PA_{IND^n} = settlement price for the $n$the IND expiration, rounded to the zero decimal place;

PA_{IND^1} = settlement price for the first IND expiration;

$RPre_{DI1}^{INDn}$ = Fixed rate for the term of the nth IND expiration, calculated by exponential interpolation of DI1 settlement prices according to equation (1.1);

$RPre_{DI1}^{IND1}$ = Fixed rate for the term of the first IND expiration, calculated by exponential interpolation of DI1 settlement prices according to equation (1.1);

DU_{IND1} = number of trading days between the calculation date and the expiration date of the first IND expiration;

DU_{INDn} = number of trading days between the calculation date and the expiration date of the $n$the IND expiration;

CC_{INDj} = cost of carry for the calculation of the settlement price for the IND expiration.

1. If the expiration in question has had its settlement price calculated based on the IR1 reference price (procedure P1) at any date prior to the calculation date, the cost of carry will be calculated according to equation (3.3), considering the parameters and prices on the date which the structured transaction had its reference price calculated.

2. If the expiration in question has not had its settlement price calculated based on the IR1 reference price at any date prior to the calculation date, the cost of carry will be the implied cost of carry in the settlement price for the IND expiration immediately prior to the nth expiration, rounded to the fourth decimal place. This cost will be determined by equation (3.3) or **equal to the previous day's cost of carry** if the settlement price for the

63

immediately preceding expiration is calculated according to the trading average.

$$CC_{INDj} = \left(\left(\frac{\left(1+\frac{RPre_{DI1}^{INDn-1}}{100}\right)^{\frac{DU_{INDn-1}}{252}} \times \left(1+\frac{RPre_{DI1}^{IND1}}{100}\right)^{\frac{-DU_{IND1}}{252}}}{\left(\frac{PA_{IND^{n-1}}}{PA_{IND^1}}\right)}\right)^{\frac{252}{DU_{INDn-1}-DU_{IND1}}} - 1\right) \quad (3.3)$$

Where:

$PA_{IND^{n-1}}$ = settlement price for the IND expiration immediately preceding the nth expiration;

PA_{IND^1} = settlement price for the first IND expiration;

$RPre_{DI1}^{INDn-1}$ = fixed rate calculated by exponential interpolation of DI1 settlement prices according to equation (1.1) for the term of the nth IND expiration immediately preceding the nth IND expiration;

$RPre_{DI1}^{IND1}$ = fixed rate for the term of the first IND expiration, calculated using exponential interpolation of DI1 settlement prices according to equation (1.1);

DU_{IND1} = number of trading days between the calculation date and the expiration date of the first IND expiration;

DU_{INDn-1} = number of trading days between the calculation date and the expiration date immediately preceding the nth IND expiration.

3.1.4 All other expirations on the expiration date of the first open contract

a)   First open expiration

The settlement price for the first IND expiration is the Ibovespa settlement, calculated according to the arithmetic average of the values of the Ibovespa index published by B3 every 30 seconds of the last three trading hours in the spot market, excluding the closing call.

Second open expiration

The settlement price for the second IND expiration is the weighted arithmetic average of the trades carried out for that month, in the time interval according to the parameters of Table 9 of the Annex of Monthly Parameters of the calculation date.

b)   Other open expirations

Procedure Sequence to determine the settlement price for other expirations

P1. When the IR1 of the second expiration for the IND expiration to be quoted has a reference price, the corresponding settlement price will be given using equation (3.5) by the sum of (i) the settlement price for the second expiration and (ii) the IR1 reference price:

$$PA_{IND^n} = PA_{IND^2} + PRef_{IR1}^{2.n} \qquad (3.5)$$

Where:

PA_{IND^n} = settlement price for the nth IND expiration, rounded to the zero decimal place;

PA_{IND^2} = settlement price for the second IND expiration;

$PRef_{IR1}^{2.n}$ = IR1 reference price from the second to the nth expiration.

P2. When the IR1 of the second expiration for the IND expiration to be quoted has a reference price, the corresponding settlement price will be given according to equation (3.6) from (i) the settlement price for the first expiration, (ii) fixed interest rate, and (iii) the implied cost of carry in the settlement prices from the previous business day:

$$PA_{IND^n} = PA_{IND^2} \times \frac{\left(1+\frac{TPre_{DI1}^{INDn}}{100}\right)^{\frac{DU_{INDn}}{252}} \times \left(1+\frac{RPre_{DI1}^{IND2}}{100}\right)^{\frac{-DU_{IND2}}{252}}}{(1+CC_{INDn})^{\frac{DU_{INDn}-DU_{IND2}}{252}}} \tag{3.6}$$

Where:

PA_{IND^n} = settlement price for the nth IND expiration, rounded to the zero decimal place;

PA_{IND^2} = settlement price for the second IND expiration;

$RPre_{DI1}^{INDn}$ = fixed rate for the term of the nth IND expiration calculated by exponential interpolation of DI1 settlement prices according to equation (1.1);

$RPre_{DI1}^{IND2}$ = fixed rate for the term of the second IND expiration calculated by exponential interpolation of DI1 settlement prices according to equation (1.1);

DU_{IND2} = number of trading days between the calculation date and the expiration date of the second IND expiration;

DU_{INDn} = number of trading days between the calculation date and the expiration date of the nth IND expiration;

CC_{INDn} = implied cost of carry in the settlement price for the nth IND expiration on the immediately preceding business day calculated according to equation (3.3).

From the available Convenience Yield curve, it is possible to find the IND futures prices.

66

$$PA_{IND^n} = IBV_{LIQ} \times \frac{\left(1+\frac{TPre_{DI1}^{INDn}}{100}\right)^{\frac{DU_{INDn}}{252}}}{\left(1+\frac{CYI_{INDn}}{100}\right)^{\frac{DU_{INDn}}{252}}} \tag{3.7}$$

Where:

PA_{IND^n} = settlement price for the nth IND expiration;

IBV_{LIQ} = settlement price for the Ibovespa expiration;

$RPre_{DI1}^{INDn}$ = fixed rate for the term of the nth IND expiration calculated by exponential interpolation of DI1 settlement prices according to equation (1.1);

DU_{INDn} = number of trading days between the calculation date and the expiration date of the nth IND expiration;

CYI_{INDn} = implied cost of carry in the settlement price for the nth IND expiration on the immediately preceding business day calculated according to equation (3.3), considering the parameters of the immediately preceding business day.

3.2 IBrX-50 Futures (BRI)

The settlement price for the IBrx-50 Futures Contract is expressed as index point values in Brazilian Reals, each point BRL10.00.

BRI settlement prices are calculated using non-arbitrage formulas. The calculation methodology of the first open expiration differs from that of other expirations on expiration date.

67

3.2.1 All open expirations

The settlement price for all BRI expirations is given by equation (3.8):

$$PA_{BRI^n} = IBrX50_{SET} \times \frac{\left(1+\frac{RPre_{DI1}^{IBrX50n}}{100}\right)^{\frac{DU_{IBrX50n}}{252}}}{(1+CC_{IBrX50})^{\frac{DU_{IBrX50n}}{252}}} \qquad (3.8)$$

Where:

PA_{BRI^n} = settlement price for the nth BRI expiration, rounded to the zero decimal place;

$IBrX50_{SET}$ = IBrX-50 closing, calculated based on the closing prices of stocks that compose the index portfolio, truncated to the zero decimal place;

$RPre_{DI1}^{IBrX50n}$ = fixed rate for the nth BRI expiration term, calculated using exponential interpolation of DI1 settlement prices according to equation (1.1);

$DU_{IBrX50n}$ = number of trading days between the calculation date and the expiration date of the nth BRI expiration do BRI;

CC_{IBrX50} = IBrX-50 theoretical portfolio cost of carry calculated using equation (3.9)

$$CC_{IBrX50} = \sum_{j=1}^{na} p_{stock_j} \times \left(\frac{TT_{stock_j}+TD_{stock_j}}{2}\right) \qquad (3.9)$$

Where:

CC_{IBrX50} = IBrX-50 theoretical portfolio cost of carry, rounded to the second decimal place;

na = number of stocks in the IBrX-50 theoretical portfolio;

p_{stock_j} = participation percentage of the stock j in the IBrX-50 theoretical portfolio;

68

TT_{stock_j} = annualized average ask rate (quantity-weighted) of registered stock j loan contracts for all terms and modalities in the three business days prior to the calculation date published by B3;

TD_{stock_j} = annualized average bid rate (quantity-weighted) of the registered j stock loan contracts for all terms and modalities in the three business days prior to the calculation date published by B3.

3.2.2 First open expiration on the last trading day

The settlement price for the first BRI expiration is the Brazil-50 settlement Index calculated using the arithmetic average of the index values published by B3 every 30 seconds in the last three trading hours of the spot market, excluding the closing call.

3.3 S&P 500 Index Futures (ISP) and Micro S&P 500 Futures (WSP)

The settlement price for the **S&P 500 Index Futures** is expressed as index point values in Brazilian Reals, rounded to the second decimal place. WSP settlement prices are the settlement prices of the respective ISP expirations.

ISP settlement prices are calculated from a preferential sequence of procedures. The methodology for calculating the first open expiration differs from the methodology for calculating other expirations on expiration date.

3.3.1 All open expirations

The CME Group reference price for ISP expirations is defined as the price determined from the following preferential procedure sequence carried out after the end of the contract closing call at B3:

a) settlement price for the S&P 500 Futures Contract published by the CME Group.

b) If settlement prices are not available due to holiday in the U.S., the S&P 500 Futures Contract reference price will be the CME Group S&P 500 Futures Contract settlement price from the previous day.

c) If the settlement prices are not available due to time zone difference, the S&P 500 Futures Contract trade price will be CME Group trading platform price nearest to the end of the ISP closing call at B3.

d) If the trade price on the CME Group trading platform nearest to the end of the closing call was before the start of the ISP closing call at B3, the reference price will be the sum of (i) the CME Group reference price for the first expiration and (ii) the difference between the settlement prices published by CME Group on the previous business day for the non-trading expiration on the CME Group platform and the first expiration calculated according to equation (3.10)

$$Pref_{ISP^n,t}^{CME} = Pref_{ISP^1,t}^{CME} + \left(PA_{ISP^n,t-1}^{CME} - PA_{ISP^1,t-1}^{CME} \right) \qquad (3.10)$$

Where:

$Pref_{ISP^n,t}^{CME}$ = CME Group reference price Group for the nth expiration of the S&P 500 Futures Contract on the calculation date t;

$Pref_{ISP^1,t}^{CME}$ = CME Group reference price for the first expiration of the S&P 500 Futures Contract on the calculation date t;

$PA_{ISP^n,t-1}^{CME}$ = settlement price for the nth expiration of the S&P 500 Futures Contract published by the CME Group on the business day prior to the calculation date ($t-1$);

$PA_{ISP^1,t-1}^{CME}$ = settlement price for the first expiration of the S&P 500 Futures Contract published by the CME Group on the business day prior to the calculation date ($t-1$).

The settlement price resulting from any procedure will satisfy B3 trading platform **valid order** requirements.

Procedure sequence to determine the settlement price for a given expiration of the contract

P1. The settlement price will be the price established at the electronic closing call for the expiration in question.

P2. If procedure P1 cannot be applied, the settlement price will be the average **valid bid prices** and **valid ask prices** with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 4 of the Monthly Parameters Annex.

P3. If procedure P1 or P2 cannot be applied, the settlement price will be given by the sum of (i) the CME Group reference price for the expiration in question, (ii) the spread between the prices of the contract traded on the B3 and the CME Group calculated based on the first expiration according to equation (3.11). If the first expiration has no settlement price calculated based on procedure P1 or P2, the spread will be zero. Equation (3.12) presents the calculation of the settlement price by means of procedure P3.

$$Spread_{CME}^{B3} = PA_{ISP^1}^{B3} - Pref_{ISP^1}^{CME} \qquad (3.11)$$

Where:

$Spread_{CME}^{B3}$ = spread between contract prices traded at B3 and the CME Group;

$PA_{ISP^1}^{B3}$ = settlement price for the first ISP expiration calculated by B3

$Pref_{ISP^1}^{CME}$ = CME Group reference price for the first expiration of the S&P 500 Futures Contract.

$$PA_{ISP^n} = Pref_{ISP^n}^{CME} + Spread_{CME}^{B3} \qquad (3.12)$$

Where:

PA_{ISP^n} = settlement price for the nth ISP expiration;

$Pref_{ISP^n}^{CME}$ = CME Group reference price for the $n$the expiration of the S&P 500 Futures Contract;

$Spread_{CME}^{B3}$ = spread between contract prices traded at B3 and the CME Group;

Settlement prices calculated from the procedures above include rollover trades/offers that meet quantity and exposure time requirements and were executed during the price formation time of the expirations that make up the rollover contract.

In the event the day's CME settlement prices are unavailable due to a public holiday in the United States, attention must be paid to the domestic market, in the case of **invalid orders** during the trading session. In the event of a conflict between the closing price calculated by the P3 procedure and the trading price (s), or between the price (s) of **invalid offers**, during the B3 trading session , the settlement price may be defined at the discretion of B3 in order to adapt to the domestic market, upon approval by the B3 CCP Technical Risk Committee.

3.3.2 First open expiration on the last trading day

The settlement price for the first ISP expiration on the expiration date is the settlement price used by the CME Group for settlement of that expiration. This price can be found at the Bloobmerg terminal under the ticker: SPXSET Index QR. However, B3 will disclose the price only at the close of the day together with the other adjustment prices for other maturities.

On the expiration date, due to the migration of liquidity from the first to the second expiration, the spread between prices of the contract traded at B3 and the CME Group, calculated according to equation (3.11), is calculated using the second expiration.

3.4 FTSE/JSE Top40 Index Futures (JSE)

The settlement price for the BVMF FTSE/JSE Top40 Futures Contract is expressed in index point values in Brazilian Reals, reported with zero decimal places.

The calculation methodology of the first open expiration differs from other expirations on the expiration date.

3.4.1 All open expirations

Procedure sequence to determine the settlement price for a given expiration of the contract

P1. The settlement price will be the price established at the electronic closing call for the expiration in question.

P2. If procedure P1 cannot be applied, the settlement price will be the average **valid bid prices** and **valid ask prices** with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 5 of the Monthly Parameters Annex

P3. If procedure P2 cannot be applied, the settlement price will be the settlement price for the respective expiration of the Top40 FTSE/JSE Futures Index published by the Johannesburg Stock Exchange.

3.4.2 First open expiration on the last trading day

The settlement price for the first JSE expiration on the expiration date is the settlement price for the respective expiration of the Top40 FTSE/JSE Futures Index published by the Johannesburg Stock Exchange.

3.5 Hang Seng Index Futures (HSI)

The settlement price for the BVMF Hang Seng Index Futures Contract is expressed in index points values in Brazilian Reals, reported with zero decimal places.

HSI settlement prices are calculated from the same procedures and parameters used for the JSE and shown in section 3.4, considering the replacement of the FTSE/JSE Top40 Index with the Hang Seng Index and the replacement of the Johannesburg Stock Exchange with the Hong Kong Exchanges and Clearing Limited.

3.6 MICEX Index Futures (MIX)

The settlement price for the BVMF MICEX Index Futures Contract is expressed in index point values in Brazilian Reals, reported with zero decimal places.

MIX settlement prices are calculated from the same procedures and parameters used for the JSE and shown in section 3.4, considering the replacement of the FTSE/JSE Top40 Index with the MICEX Index and the replacement of the Johannesburg Stock Exchange with MICEX-RTS.

3.7 S&P Merval Futures (IMV)

The settlement price for the S&P Merval Futures Futures Contract is expressed in index point values in Brazilian Reals, reported with zero decimal places.

IMV settlement prices are calculated from a preferential sequence of procedures. The methodology for calculating the first open expiration differs from the methodology for calculating other expirations on expiration date.

3.7.1 All open expirations

The BYMA reference price for ISV expirations is defined as the price determined from the following preferential procedure sequence carried out after the end of the contract closing call at B3:

e)   settlement price for the S&P Merval Futures Contract published by BYMA;

f)   If settlement prices are not available due to holiday in Argentina, the S&P Merval Futures Contract reference price will be the BYMA S&P Merval Futures Contract settlement price from the previous day.

g)   If the settlement prices are not available due to time zone difference, the S&P Merval Futures Contract trade price will be BYMA trading platform price nearest to the end of the IMV closing call at B3.

h)   If the trade price on BYMA trading platform nearest to the end of the closing call was before the start of the ISP closing call at B3, the reference price will be the sum of (i) the BYMA Group reference price for the first expiration and (ii) the difference between the settlement prices published by BYMA on the prior business day for the non-trading expiration on the BYMA platform and the first expiration calculated according to equation (3.13)

$$Pref_{IMV^n,t}^{BYMA} = Pref_{IMV^1,t}^{BYMA} + \left(PA_{IMV^n,t-1}^{BYMA} - PA_{IMV^1,t-1}^{BYMA} \right) \qquad (3.13)$$

Where:

$Pref_{IMV^n,t}^{BYMA}$ = BYMA reference price for the nth expiration of the S&P Merval Futures Contract on the calculation date t;

$Pref_{IMV^1,t}^{BYMA}$ = BYMA Group reference price for the first expiration of the S&P Merval Futures Contract on the calculation date t;

75

$PA_{IMV^n,t-1}^{BYMA}$ = settlement price for the nth expiration of the S&P Merval Futures Contract published by BYMA on the previous business day to the calculation date $(t-1)$;

$PA_{IMV^1,t-1}^{BYMA}$ = settlement price for the first expiration of the S&P Merval Futures Contract published by BYMA on the previous business day to the calculation date $(t-1)$.

The settlement price resulting from any procedure will satisfy B3 trading platform **valid order** requirements.

Procedure sequence to determine the settlement price for a given expiration of the contract

P1. The settlement price will be the price established at the electronic closing call for the expiration in question.

P2. If procedure P1 cannot be applied, the settlement price will be the average **valid bid prices** and **valid ask prices** with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 4 of the Monthly Parameters Annex.

P3. If procedure P1 or P2 cannot be applied, the settlement price will be given by the sum of (i) the BYMA reference price for the expiration in question, (ii) the spread between the prices of the contract traded on the B3 and the BYMA calculated based on the first expiration according to equation (3.14). If the first expiration has no settlement price calculated based on procedure P1 or P2, the spread will be zero. Equation (3.15) presents the calculation of the settlement price by means of procedure P3.

$$Spread_{BYMA}^{B3} = PA_{IMV^1}^{B3} - Pref_{IMV^1}^{BYMA} \tag{3.14}$$

Where:

$Spread_{BYMA}^{B3}$ = spread between contract prices traded at B3 and the BYMA;

$PA_{IMV^1}^{B3}$ = settlement price for the first IMV expiration calculated by B3;

$Pref_{IMV^1}^{BYMA}$ = BYMA reference price for the first expiration of the S&P Merval Futures Contract.

$$PA_{IMV^n} = Pref_{IMV^n}^{BYMA} + Spread_{BYMA}^{B3} \qquad (3.15)$$

Where:

PA_{IMV^n} = settlement price for the nth IMV expiration;

$Pref_{IMV^n}^{BYMA}$ = BYMA reference price for the $n$the expiration of the S&P Merval Futures Contract;

$Spread_{BYMA}^{B3}$ = spread between contract prices traded at B3 and the CME Group;

Settlement prices calculated from the procedures above include rollover trades/offers that meet quantity and exposure time requirements and were executed during the price formation time of the expirations that make up the rollover contract.

In the event the day's BYMA settlement prices are unavailable due to a public holiday in the United States, attention must be paid to the domestic market, in the case of **invalid orders** during the trading session. In the event of a conflict between the closing price calculated by the P3 procedure and the trading price (s), or between the price (s) of **invalid offers**, during the B3 trading session , the settlement price may be defined at the discretion of B3 in order to adapt to the domestic market, upon approval by the B3 CCP Technical Risk Committee.

3.72 First open expiration on the last trading day

The settlement price for the first IMV expiration on the expiration date is the settlement price used by BYMA for settlement of that expiration.

On the expiration date, due to the migration of liquidity from the first to the second expiration, the spread between prices of the contract traded at B3 and BYMA, calculated according to equation (3.14), is calculated using the second expiration.

3.8 Nikkei 225 Futures Contract (INK)

The settlement price for the Nikkei 225 Futures Contract is expressed in index points values in Brazilian Reals, reported with zero decimal places.

INK settlement prices are calculated from a preferential sequence of procedures. The methodology for calculating the first open expiration differs from the methodology for calculating other expirations on expiration date.

3.8.1 All open expirations

The TSE reference price for INK expirations is defined as the price determined from the following preferential procedure sequence carried out after the end of the contract closing call at B3:

i) settlement price for the Nikkei 225 Futures Contract published by the TSE;

j) If settlement prices are not available due to holiday in Japan, the INK reference price will be the Nikkei 225 Futures Contract settlement price from the previous day as published by the TSE.

k) If the settlement prices are not available due to time zone difference, the Nikkei 225 Futures Contract trade price will be the TSE trading platform price nearest to the end of the INK closing call at B3.

l) If the trade price on the TSE trading platform nearest to the end of the closing call was before the start of the INK closing call at B3, the reference

78

price will be the sum of (i) the CME Group reference price for the first expiration and (ii) the difference between the settlement prices published by CME Group on the previous business day for the non-trading expiration on the CME Group platform and the first expiration calculated according to equation (3.16)

$$Pref_{INK^n,t}^{TSE} = Pref_{INK^1,t}^{TSE} + \left(PA_{INK^n,t-1}^{TSE} - PA_{INK^1,t-1}^{TSE}\right) \qquad (3.16)$$

Where:

$Pref_{INK^n,t}^{TSE}$ = TSE reference price for the nth expiration of the or the nth expiration of the Nikkei 225 Futures Contract on the calculation date t;

$Pref_{INK^1,t}^{TSE}$ = TSE reference price for the first expiration of the Nikkei 225 Futures Contract on the calculation date t;

$PA_{INK^n,t-1}^{TSE}$ = settlement price for the nth expiration of the Nikkei 225 Futures Contract published by the TSE on the business day prior to the calculation date ($t - 1$);

$PA_{INK^1,t-1}^{TSE}$ = settlement price for the first expiration of the Nikkei 225 Futures Contract published by the TSE on the business day prior to the calculation date ($t - 1$).

The settlement price resulting from any procedure will satisfy B3 trading platform **valid order** requirements.

Procedure sequence to determine the settlement price for a given expiration of the contract

P1. The settlement price will be the price established at the electronic closing call for the expiration in question.

79

P2. If procedure P1 cannot be applied, the settlement price will be the average **valid bid prices** and **valid ask prices** with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 4 of the Monthly Parameters Annex.

P3. If procedure P1 or P2 cannot be applied, the settlement price will be given by the sum of (i) the TSE reference price for the expiration in question, (ii) the spread between the prices of the contract traded on the B3 and the TSE calculated based on the first expiration according to equation (3.17). If the first expiration has no settlement price calculated based on procedure P1 or P2, the spread will be zero. Equation (3.18) presents the calculation of the settlement price by means of procedure P3.

$$Spread_{TSE}^{B3} = PA_{INK^1}^{B3} - Pref_{INK^1}^{TSE} \qquad (3.17)$$

Where:

$Spread_{TSE}^{B3}$ = spread between contract prices traded at B3 and the TSE;

$PA_{INK^1}^{B3}$ = settlement price for the first INK expiration calculated by B3;

$Pref_{INK^1}^{TSE}$ = TSE reference price for the first expiration of the Nikkei 225 Futures Contract.

$$PA_{INK^n} = Pref_{INK^n}^{TSE} + Spread_{TSE}^{B3} \qquad (3.18)$$

Where:

PA_{INK^n} = settlement price for the nth INK expiration;

$Pref_{INK^n}^{TSE}$ = TSE reference price for the $n$the expiration of the Nikkei 225 Futures Contract;

$Spread_{TSE}^{B3}$ = spread between contract prices traded at B3 and the CME TSE;

Settlement prices calculated from the procedures above include rollover trades/offers that meet quantity and exposure time requirements and were executed during the price formation time of the expirations that make up the rollover contract.

In the event the day's settlement prices are unavailable due to a public holiday in Japan, attention must be paid to the domestic market, in the case of **invalid orders** during the trading session. In the event of a conflict between the closing price calculated by the P3 procedure and the trading price (s), or between the price (s) of **invalid offers**, during the B3 trading session , the settlement price may be defined at the discretion of B3 in order to adapt to the domestic market, upon approval by the B3 CCP Technical Risk Committee.

3.8.2 First open expiration on the last trading day

The settlement price for the first INK expiration on the expiration date is the settlement price used by the TSE for settlement of that expiration.

On the expiration date, due to the migration of liquidity from the first to the second expiration, the spread between prices of the contract traded at B3 and the TSE, calculated according to equation (3.17), is calculated using the second expiration.

3.9 Stock Futures

The settlement price for the Stock Futures Contract is expressed in Brazilian Reals per share. The price is disclosed to Two decimal places, rounded to the second decimal place.

3.9.1 All open expirations

Procedure sequence to determine the settlement price for a given expiration of the contract

The procedure for determining the settlement price for a given expiration of the contract is a non-arbitrage relationship between (i) the closing price of the stock, (ii) interest rate and (iii) the average rate of stoke rental for the day.

The settlement price will calculated as follows

$$PA_n = S(t) \cdot \frac{(1 + r_n)^{\frac{DU_n}{252}}}{(1 + c_n^{PA})^{\frac{DU_n}{252}}} \tag{3.19}$$

Where:

PA_n =settlement price for the nth expiration, rounded to the second decimal place;

$S(t)$ = Stock closing price

DU_n= Business days until the expiration date

r_n= fixed interest rate calculated using daily settlement price of the DI1 future;

c_n^{PA}= average rental cost of the underlying stock in the BTB system on calculation day considering the trades and renewals carried out up to the time of calculation;

3.9.2 First open expiration on the last trading day

On the expiration date, the settlement price will be the closing price of the underlying share of the futures contract.

3.9.3 Adjusted settlement price

The value of the daily adjustment to financial settlement is calculate as the difference of day price and prior business day. If a corporate event occurs on the underlying share of the future contract, the settlement price will be adjusted.

82

$$DailySettlValue(t) = PA(t) - PA_{Aj}(t-1)$$

Where:

$DailySettlValue(t)$ = the value of the daily adjustment to financial settlement when there is a corporate event on the stock or not;

$PA(t)$ = settlement price on date *t*, for the respective expiration;

$PA_{Aj}(t-1)$ = settlement price on the prior business day, adjusted according to the corporate event, if necessary.

The adjustment made to the settlement price and to the future contract position, when applicable, as per the corporate event, is described in The B3 Operating Procedures Manual, available on the B3 website, in the Regulation, Regulations and Manuals, Clearing, settlement, and risk management.

3.10 DAX Futures Contract (INK)

The settlement price for the DAX Futures Contract is expressed in index points values in Brazilian Reals, reported with zero decimal places.

DAX settlement prices are calculated from a preferential sequence of procedures. The methodology for calculating the first open expiration differs from the methodology for calculating other expirations on expiration date.

3.10.1 All open expirations

The Eurex reference price for DAX expirations is defined as the price determined from the following preferential procedure sequence carried out after the end of the contract closing call at B3:

a) settlement price for the DAX Futures Contract published by the Eurex;

b) If settlement prices are not available due to holiday in the trading location, the DAX reference price will be the DAX Futures Contract settlement price from the previous day as published by the Eurex.

c) If the settlement prices are not available due to time zone difference, the DAX Futures Contract trade price will be the Eurex trading platform price nearest to the end of the DAX closing call at B3.

d) If the trade price on the Eurex trading platform nearest to the end of the closing call was before the start of the DAX closing call at B3, the reference price will be the sum of (i) the Eurex reference price for the first expiration and (ii) the difference between the settlement prices published by Eurex on the previous business day for the non-trading expiration on the Eurex platform and the first expiration calculated according to equation (3.20)

$$Pref_{DAX^n,t}^{Eurex} = Pref_{DAX^1,t}^{Eurex} + \left(PA_{DAX^n,t-1}^{Eurex} - PA_{DAX^1,t-1}^{Eurex}\right) \qquad (3.20)$$

Where:

$Pref_{DAX^n,t}^{Eurex}$ = Eurex reference price for the nth expiration of the or the nth expiration of the DAX Futures Contract on the calculation date t;

$Pref_{DAX^1,t}^{Eurex}$ = Eurex reference price for the first expiration of the DAX Futures Contract on the calculation date t;

$PA_{DAX^n,t-1}^{Eurex}$ = settlement price for the nth expiration of the DAX Futures Contract published by the Eurex on the business day prior to the calculation date $(t-1)$;

$PA_{DAX^1,t-1}^{Eurex}$ = settlement price for the first expiration of the DAX Futures Contract published by the Eurex on the business day prior to the calculation date $(t-1)$.

The settlement price resulting from any procedure will satisfy B3 trading platform   **valid order** requirements.

Procedure sequence to determine the settlement price for a given expiration of the contract

P1. The settlement price will be the price established at the electronic closing call for the expiration in question.

P2. If procedure P1 cannot be applied, the settlement price will be the average **valid bid prices** and **valid ask prices** with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 4 of the Monthly Parameters Annex.

P3. If procedure P1 or P2 cannot be applied, the settlement price will be given by the sum of (i) the Eurex reference price for the expiration in question, (ii) the spread between the prices of the contract traded on the B3 and the Eurex calculated based on the first expiration according to equation (3.21). If the first expiration has no settlement price calculated based on procedure P1 or P2, the spread will be zero. Equation (3.22) presents the calculation of the settlement price by means of procedure P3.

$$Spread_{Eurex}^{B3} = PA_{DAX^1}^{B3} - Pref_{DAX^1}^{Eurex} \tag{3.21}$$

Where:

$Spread_{Eurex}^{B3}$ = spread between contract prices traded at B3 and the Eurex;

$PA_{DAX^1}^{B3}$ = settlement price for the first DAX expiration calculated by B3;

$Pref_{DAX^1}^{TSE}$ = Eurex reference price for the first expiration of the DAX Futures Contract.

$$PA_{DAX^n} = Pref_{DAX^n}^{Eurex} + Spread_{Eurex}^{B3} \qquad (3.22)$$

Where:

PA_{DAX^n} = settlement price for the nth DAX expiration;

$Pref_{DAX^n}^{Eurex}$ = Eurex reference price for the $n$the expiration of the DAX Futures Contract;

$Spread_{Eurex}^{B3}$ = spread between contract prices traded at B3 and the Eurex;

Settlement prices calculated from the procedures above include rollover trades/offers that meet quantity and exposure time requirements and were executed during the price formation time of the expirations that make up the rollover contract.

In the event the day's settlement prices are unavailable due to a public holiday trading location, attention must be paid to the domestic market, in the case of **invalid orders** during the trading session. In the event of a conflict between the closing price calculated by the P3 procedure and the trading price (s), or between the price (s) of **invalid offers**, during the B3 trading session , the settlement price may be defined at the discretion of B3 in order to adapt to the domestic market, upon approval by the B3 CCP Technical Risk Committee.

3.10.2 First open expiration on the last trading day

The settlement price for the first DAX expiration on the expiration date is the settlement price used by the Eurex for settlement of that expiration.

On the expiration date, due to the migration of liquidity from the first to the second expiration, the spread between prices of the contract traded at B3 and the Eurex, calculated according to equation (3.21), is calculated using the second expiration.

86

3.11 Euro Stoxx 50 Futures Contract (ESX)

The settlement price for the ESX Futures Contract is expressed in index points values in Brazilian Reals, reported with zero decimal places.

ESX settlement prices are calculated from a preferential sequence of procedures. The methodology for calculating the first open expiration differs from the methodology for calculating other expirations on expiration date.

3.11.1 All open expirations

The Eurex reference price for ESX expirations is defined as the price determined from the following preferential procedure sequence carried out after the end of the contract closing call at B3:

a) settlement price for the ESX Futures Contract published by the Eurex;

b) If settlement prices are not available due to holiday in the trading location, the ESX reference price will be the ESX Futures Contract settlement price from the previous day as published by the Eurex.

c) If the settlement prices are not available due to time zone difference, the ESX Futures Contract trade price will be the Eurex trading platform price nearest to the end of the ESX closing call at B3.

d) If the trade price on the Eurex trading platform nearest to the end of the closing call was before the start of the ESX closing call at B3, the reference price will be the sum of (i) the Eurex reference price for the first expiration and (ii) the difference between the settlement prices published by Eurex on the previous business day for the non-trading expiration on the Eurex platform and the first expiration calculated according to equation (3.23)

$$Pref_{ESX^n,t}^{Eurex} = Pref_{ESX^1,t}^{Eurex} + \left(PA_{ESX^n,t-1}^{Eurex} - PA_{ESX^1,t-1}^{Eurex} \right) \qquad (3.23)$$

Where:

87

$Pref_{ESX^n,t}^{Eurex}$ = Eurex reference price for the nth expiration of the or the nth expiration of the ESX Futures Contract on the calculation date t;

$Pref_{ESX^1,t}^{Eurex}$ = Eurex reference price for the first expiration of the ESX Futures Contract on the calculation date t;

$PA_{ESX^n,t-1}^{Eurex}$ = settlement price for the nth expiration of the ESX Futures Contract published by the Eurex on the business day prior to the calculation date $(t-1)$;

$PA_{ESX^1,t-1}^{Eurex}$ = settlement price for the first expiration of the ESX Futures Contract published by the Eurex on the business day prior to the calculation date $(t-1)$.

The settlement price resulting from any procedure will satisfy B3 trading platform **valid order** requirements.

Procedure sequence to determine the settlement price for a given expiration of the contract

P1. The settlement price will be the price established at the electronic closing call for the expiration in question.

P2. If procedure P1 cannot be applied, the settlement price will be the average **valid bid prices** and **valid ask prices** with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 4 of the Monthly Parameters Annex.

P3. If procedure P1 or P2 cannot be applied, the settlement price will be given by the sum of (i) the Eurex reference price for the expiration in question, (ii) the spread between the prices of the contract traded on the B3 and the Eurex calculated based on the first expiration according to equation (3.24). If the first expiration has no settlement price calculated based on procedure P1 or P2, the

88

spread will be zero. Equation (3.25) presents the calculation of the settlement price by means of procedure P3.

$$Spread_{Eurex}^{B3} = PA_{ESX^1}^{B3} - Pref_{ESX^1}^{Eurex}$$ (3.24)

Where:

$Spread_{Eurex}^{B3}$ = spread between contract prices traded at B3 and the Eurex;

$PA_{ESX^1}^{B3}$ = settlement price for the first ESX expiration calculated by B3;

$Pref_{ESX^1}^{TSE}$ = Eurex reference price for the first expiration of the ESX Futures Contract.

$$PA_{ESX^n} = Pref_{ESX^n}^{Eurex} + Spread_{Eurex}^{B3}$$ (3.25)

Where:

PA_{ESX^n} = settlement price for the nth ESX expiration;

$Pref_{ESX^n}^{Eurex}$ = Eurex reference price for the $n$the expiration of the ESX Futures Contract;

$Spread_{Eurex}^{B3}$ = spread between contract prices traded at B3 and the Eurex;

Settlement prices calculated from the procedures above include rollover trades/offers that meet quantity and exposure time requirements and were executed during the price formation time of the expirations that make up the rollover contract.

In the event the day's settlement prices are unavailable due to a public holiday trading location, attention must be paid to the domestic market, in the case of **invalid orders** during the trading session. In the event of a conflict between the closing price calculated by the P3 procedure and the trading price (s), or between

89

the price (s) of **invalid offers**, during the B3 trading session , the settlement price may be defined at the discretion of B3 in order to adapt to the domestic market, upon approval by the B3 CCP Technical Risk Committee.

3.10.2 First open expiration on the last trading day

The settlement price for the first ESX expiration on the expiration date is the settlement price used by the Eurex for settlement of that expiration.

On the expiration date, due to the migration of liquidity from the first to the second expiration, the spread between prices of the contract traded at B3 and the Eurex, calculated according to equation (3.24), is calculated using the second expiration.

3.12 Real Estate Investment Fund Index Futures (XFI)

The settlement price for the Real Estate Investment Fund Index Futures Contract (XFI) is expressed in 10 Brazilian Reals per an index point.

Procedure Sequence to determine the settlement price for a given expiration of the contract

P1. The settlement price will be calculated using the average price of **valid trades** (see General Provisions section) within the **average calculation window** according to the parameters shown in Table 11 of the Monthly Parameters Annex for the afore mentioned contract.

P2. If procedure P1 cannot be applied, the settlement price for the expiration in question will be the average **valid bid** prices and **valid ask** prices with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 11 of the Monthly Parameters Annex.

P3. If procedure P2 cannot be applied, the settlement price for the expiration in question will be defined according to the equation (3.26).

$$PA_{XFI^n,t} = PA_{XFI^n,t-1} \times Spread \qquad (3.26)$$

90

Where:

$PA_{XFI^n,t}$ = settlement price for the nth FXI expiration in trading session t;

$PA_{XFI^n,t-1}$ = settlement price for the nth FXI expiration in trading session t-1;

$Spread$ = determined by one of the methods (P3.1 or P3.2) below:

P3.1 If there is at least one expiration j with settlement price determined by P1 or P2 procedure, the spread used in the remaining n expiration will be defined according to the equation (3.27).

$$Spread = \sum_{j=1}^{k} \frac{Spread_j}{k} \qquad (3.27)$$

Where:

k = quantity of expiration with settlement price determined by P1 or P2 procedure;

$Spread_j = \dfrac{PA_{FXI^n_{,t}}}{PA_{FXI^n_{,t-1}}}$, ratio between settlement price for the nth FXI expiration in trading sessions t and t-1.

P3.2 If none of the n expiration is determined by procedure P1 or P2, the Spread is determined by the IFIX index ratio according to the equation 3.28.

$$Spread = \frac{IFIX_t}{IFIX_{t-1}} \qquad (3.28)$$

Where:

$IFIX_t$ = closing price for the IFIX indicator in the trading session t.

P4.1. If it is the first trading day of the contract n and no settlement price has been determined by procedures P1 or P2, having previous expiration (*a*) with a settlement price defined by P1 or P2 and a following expiration (*p*) with a

91

settlement price defined by P1 or P2, the settlement price of contract n will be defined by the exponential interpolation, given in the Section 1.4.1 in the B3 Curves Manual.

P4.2. If it is the first trading day of the contract n and no settlement price has been determined by procedures P1 or P2, having previous expiration (*a*) with a settlement price defined by P1 or P2 and no following expiration (*p*) with a settlement price defined by P1 or P2, the settlement price of contract n will be defined by the exponential interpolation, given in the Section 1.4.8 in the B3 Curves Manual.

4   COMMODITIES

The procedures for calculating settlement prices for commodities futures contracts involve the following definitions below:

(i) **Valid order,** is defined as a order present and the close of trading that meets the following conditions:

a)   Present at the closing call;

b)   Minimum exposure of 30 seconds;

c)   Minimum quantity equal to or greater than the quantity threshold established in the contract, as shown in Table 7 the Monthly Parameters Annex. To assess the quantity of bid and ask offers, the quantities of traded contracts having the same bid or ask price are also considered.

(ii)   **Valid bid-ask spread,** is the difference between:

(a) The best **valid bid** price(s); and

(b) The best **valid ask price(s)** that is smaller than or equal to the threshold set in the contract as shown in Table 7 of the Monthly Parameters Annex;

(iii)   **Average calculation window**, is the time interval prior to the

closing of the regular trading hours set for the contract as shown in Table

8 of the Monthly Parameters Annex;

(iii)   **Valid trades** are defined as trades, not including direct

trades, within the **average calculation window** and meeting the

following conditions:

a) the summed total quantity of contracts is equal to or greater than the

minimum quantity threshold set in the contract, according to the

parameters shown in Table 8 of the Monthly Parameters Annex; and

b) from a number of trades greater than the minimum

quantity threshold set for the contract, according to the parameters

shown in Table 8 of the Monthly Parameters Annex;

The settlement price resulting from any procedure must respect the **valid orders.**

4.1 Cash Settled Live Cattle Futures Contract (BGI)

The settlement price for the Cash Settled Live Cattle Futures Contract (BGI) is expressed in Brazilian Reals per 330 arrobas, to two decimal places rounded to the second decimal place.

1 arroba is ~33 pounds

Procedure Sequence to determine the settlement price for a given expiration of the contract

P1. The settlement price will be calculated using the average price of **valid trades** within the **average calculation window** according to the parameters shown in Table 7 of the Monthly Parameters Annex for the aforementioned contract.

P2. If procedure P1 cannot be applied, the settlement price for the expiration in question will be the average **valid bid** prices and **valid ask** prices with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 7 of the Monthly Parameters Annex. If the bid-ask spread is greater than the valid bid-ask spread, the settlement price for the expiration in question will be:

P2.1. Price determined from structured Live Cattle rollover transactions carried out throughout the day, provided that the short or long leg carry settlement

94

prices determined from the trades (P1) or average valid bid-ask prices (P2). The settlement price will be calculated from equation (4.1) if the expiration to be calculated is the long leg or (4.2) if the expiration to be calculated is the short leg.

$$PA_{BGI^n} = PA_{BGI^c} + BR1 \tag{4.1}$$

$$PA_{BGI^n} = PA_{BGI^l} - BR1 \tag{4.2}$$

Where:

PA_{BGI^n} = settlement price for the nth BGI expiration;

PA_{BGI^c} = settlement price for the short leg of the structured rollover transaction;

PA_{BGI^l} = settlement price for the long leg of the structured rollover transaction;

$BR1$ = average price of the structured rollover transactions weighted by the traded quantity. Direct trades (same intermediary) are not considered;

P3. If procedure P2 cannot be applied, the settlement price for the expiration in question will be calculated by applying, the settlement price from the previous trading session, the variation of the key expiration or the most liquid expiration of the block-group or inter-group-month corresponding to the expiration to be calculated according to equation (4.3). The harvest and off-season blocks follow the distribution of Table 8 of the Annex of Monthly Parameters.

$$PA_{BGI^n,t} = PA_{BGI^n,t-1} \times \frac{PA_{BGI^{key},t}}{PA_{BGI^{key},t-1}} \tag{4.3}$$

Where:

$PA_{BGI^n,t}$ = settlement price for the nth BGI expiration in trading session *t*, rounded to the second decimal place;

$PA_{BGI^{key},t}$ = settlement price for the key expiration in trading session *t* ;

If it is the first trading day of the new expiration and the settlement price has not been determined by P1 or P2, the settlement price will be calculated by adjusting the seasonality of the closest expiration using the ratio between the settlement factors available in the Annex of Monthly Parameters, according to equation (4.4):

$$PA_{BGI^n,t} = Factor_{BGI^n,t} \times \frac{PA_{BGI^{near},t}}{Factor_{BGI^{near},t}} \qquad (4.4)$$

Where:

$PA_{BGI^n,t}$ = settlement price for the nth BGI expiration in trading session t, rounded to the second decimal place;

$PA_{BGI^{near},t}$ = settlement price for the closest BGI expiration in trading session t;

$Factor_{BGI^n,t}$ = settlement price for the nth BGI expiration in trading session t;

$Factor_{BGI^{near},t}$ = settlement price for the closest BGI expiration in trading session t;

The expiration closest to expiration n is determined by the lowest number of working days between expiration n and an expiration in which the settlement price has been determined by P1 or P2 that is within the same group-month. If there is no maturity determined by P1 or P2 in the same group-month, the maturity closest to other group-month (s) in which the settlement price has been determined by P1 or P2 will be used.

4.2   4/5 Arabica Coffee Futures (ICF)

The settlement price for the 4/5 Arabica Coffee Futures Contract is expressed in U.S. Dollars per 100 bags, to two decimal places rounded to the second decimal place.

96

Procedure Sequence to determine the settlement price for a given expiration of the contract

P1. Equivalent to procedure P1 used for the Live Cattle Futures Contract, taking into account the parameters stipulated in Table 7 of the Monthly Parameters Annex for the ICF

P2. Equivalent to procedure P2 used for the Live Cattle Futures Contract, taking into account the parameters stipulated in Table 7 of the Monthly Parameters Annex and the Structured Rollover Transaction Contracts for the ICF.

P3. If procedure P2 cannot be applied, the settlement price for the expiration in question will be calculated according to equation (4.5).

$$PA_{ICF^n} = PA_{KC^n} \times Factor_{conv} + Spread_{ICF^n}^{KC^n} \tag{4.5}$$

Where:

PA_{ICF^n} = settlement price for the nth ICF expiration, rounded to the second decimal place;

PA_{KC^n} = settlement price for the Coffee "C" Futures Contract (KC) traded on the Intercontinental Exchange (ICE) with the same ICF expiration;

$Factor_{conv}$ = KC price conversion factor for the ICF quotation unit equal to 1.3228;

$Spread_{ICF^n}^{KC^n}$ = spread between the coffee futures contract prices for the B3 ICF expiration and the ICE KC expiration, calculated based on the previous day's settlement price according to equation (4.6), rounded to the second decimal place;

$$Spread_{ICF^n}^{KC^n} = PA_{t-1,ICF^n} - PA_{t-1,KC^n} \times Factor_{conv} \tag{4.6}$$

Where:

97

PA_{t-1,ICF^n} = settlement price for the nth ICF expiration calculated on the previous business day;

PA_{t-1,KC^n} = settlement price for the nth KC expiration published on the previous business day;

4.3 Cash Settled Hydrous Ethanol Futures Contract (ETH)

The settlement price for the Cash Settled Hydrous Ethanol Futures Contract is expressed in Brazilian Reals per 30 cubic meters, to two decimal places rounded to the second decimal place.

Procedure sequence to determine the settlement price for a given expiration of the contract

P1. Equivalent to procedure P1 used for the Live Cattle Futures Contract, taking into account the parameters stipulated in Table 7 of the Monthly Parameters Annex for the ETH.

P2. Equivalent to procedure P2 used for the Live Cattle Futures Contract, taking into account the parameters stipulated in Table 7 of the Monthly Parameters Annex and the Structured Rollover Transaction Contracts for the ETH

P3. If procedure P2 cannot be applied, the settlement price for the expiration in question will be the previous day's settlement price.

4.4 Cash Settled Corn Futures Contract (CCM)

The settlement price for the Cash Settled Corn Futures Contract is expressed in Brazilian Reals per 450 bags of 60 net kilograms, to two decimal places rounded to the second decimal place.

The CCM settlement price is calculated according to the same sequence of procedures used to calculate the BGI settlement price, taking into account parameters stipulated in Table 7 of the Monthly Parameters Annex and the CCM Structured Rollover Transaction Contracts.

4.5 Cash Settled Soybean Futures Contract at the CME Group Mini Soybean Futures Contract Price (SJC)

The settlement price for the Cash Settled Soybean Futures Contract at the Price of the CME Group Mini Soybean Futures Contract is expressed in U.S. Dollars per 450 bags of 60 net kilograms, to four decimal places rounded to the fourth decimal place.

The settlement price for all SJC expirations are calculated based on the settlement prices of the respective CME Group Mini Soybean Futures expiration according to equation (4.7).

$$PA_{SJC^n} = PA_{YK^n} \times Factor_{conv} \qquad (4.7)$$

Where:

PA_{SJC^n} = settlement price for the nth SJC expiration, rounded to the fourth decimal place.

PA_{YK^n} = settlement price for the CME Group Mini Soybean Futures Contract (YK) with the same SJC expiration;

$Factor_{conv}$ = the YK price conversion factor for the SJC quotation unit equal to 0.0220462.

4.6 Cash Settled Crystal Sugar Futures Contract (ACF)

The settlement price for the Cash Settled Crystal Sugar Futures Contract is expressed in Brazilian Reals per 508 bags of 50 net kilograms, to two decimal places rounded to the second decimal place..

Procedure sequence to determine the settlement price for a given expiration of the contract.

P1. Equivalent to procedure P1 used for the Live Cattle Futures Contract, taking into account the parameters stipulated in Table 7 of the Monthly Parameters Annex for the ACF.

P2. Equivalent to procedure P2 used for the Live Cattle Futures Contract, taking into account the parameters stipulated in Table 7 of the Monthly Parameters Annex and the Structured Rollover Transaction Contracts for the ACF.

P3. If procedure P2 cannot be applied, the settlement price for the expiration in question will be calculated according to equation (4.8).

$$PA_{ACF^n} = PA_{SB^{n+1}} \times TC_{R\$/USD,n+1}{}^k \times Factor_{conv} + Spread_{ACF^n}^{SB^{n+1}} \qquad (4.8)$$

Where:

PA_{ACF^n}: settlement price for the nth ACF contract month, rounded to the second decimal place;

$PA_{SB^{n+1}}$: settlement price for the Sugar No. 11 Futures Contract (SB) traded on the Intercontinental Exchange (ICE) expiring in the immediately subsequent month to the ACF expiration, identified as expiration *n+1*;

$TC_{R\$/USD,n+1}{}^k$: Brazilian Real per U.S. Dollar exchange rate for the SB expiration date at time *k* corresponding to the closing time of the ACF trade, calculated according to equation (4.9), rounded to the second decimal place;

$Factor_{conv}$: SB price conversion factor for the ACF quotation unit equal to 1.1023;

100

$Spread_{ACF^n}^{SB^{n+1}}$: spread between the sugar futures contract prices for the expirations (i) B3 *n,* and (ii) ICE *n+1.* calculated using equation (4.11).

$$TC_{R\$/USD,n+1}{}^{k} = \frac{\left(ExchangePrice_{DOL^1}{}^{k} + DR1_{dol}^{1.n+1}\right)}{1.000} \tag{4.9}$$

Where:

$ExchangePrice_{DOL^1}{}^{k}$: trading price of the first expiration of the U.S. Dollar Futures Contract (DOL) at the time immediately preceding *k*;

$DR1_{dol}^{1.n+1}$: price of the U.S. Dollar Rollover (DR1) Structured Transaction related to the first and *n+1* expirations calculated using the settlement prices of the business day prior to the calculation date according to equation (4.10), rounded to the second decimal placa:

$$DR1_{dol}^{1.n+1} = PA_{dol_{t-1}^{n+1}} - PA_{dol_{t-1}^{1}} \tag{4.10}$$

Where:

$PA_{dol_{t-1}^{n+1}}$: settlement price of the DOL *n+1* expiration on the business day prior to the calculation date;

$PA_{dol_{t-1}^{1}}$: settlement price of the first DOL expiration on the business day prior to the calculation date.

On the last trading day of the first DOL expiration, the second expiration is used to calculate the exchange rates of equations (4.9) and (4.10).

$$Spread_{ACF^n}^{SB^{n+1}} = PA_{t-1,ACF^n}$$
$$- PA_{t-1,SB^{n+1}} \times TC_{t-1,R\$/USD,n+1}{}^{k} \times Factor_{conv} \tag{4.11}$$

Where:

101

PA_{t-1,ACF^n}: settlement price for the ACF n expiration calculated on the previous business day;

$PA_{t-1,SB^{n+1}}$: settlement price for the SB *n+1* expiration on the previous business day;

$TC_{t-1,R\$/USD,n+1}{}^k$: Brazilian Real per U.S. Dollar exchange rate for the SB expiration date at *k* time corresponding to the closing time of the ACF trade on the previous day.

4.7 Cash Settled Soybean Futures Contract (SFI)

The settlement price for the Cash Settled Soybean Futures Contract
is expressed in U.S. Dollars per 450 bags of 60 net kilograms, to two decimal place rounded to the second decimal place.

Procedure sequence to determine the settlement price for a given expiration of the contract.

P1.   Equivalent to procedure P1 used for the Live Cattle Futures Contract, considering the parameters stipulated in Table 7 of the Monthly Parameters Annex for the SFI.

P2.   Equivalent to procedure P2 used for the Live Cattle Futures Contract, considering the parameters stipulated in Table 7 of the Monthly Parameters Annex and the Structured Rollover Transaction Contracts for the SFI.

P3. If procedure P2 cannot be applied, the settlement price for the contract month in question will be the settlement price for the respective contract month of the Cash Settled Soybean Futures Contract at the Price of the CME Group Mini Soybean Futures Contract (SJC).

102

4.8 Gold Futures Contract (OZ1)

The settlement price for the Gold Futures Contract is expressed in Brazilian Reals per gram, to three decimal points.

The settlement price is calculated using the Gold price quote on day t, and charged the interest rate until the day the contract expires, according to the equation (4.11)

$$PA_{OZ1_t^n} = Gold_t \times \left(1 + TPre_{DI1,t}^n\right)^{\frac{DU_n}{252}} \tag{4.11}$$

Where:

$PA_{OZ1_t^n}$: settlement price on date t, *rounded to the third decimal place;*

$Gold_t$: Gold quote on date t;

$TPre_{DI1,t}^n$: pre-defined interest rate for the period of nth OZ1 expiration, calculated by exponential interpolation of DI1 settlement prices using equation (1.1) on date t;

DU_n: number of trading days between the calculation date and the expiration of the nth expiration.

On expiration day, the settlement price is calculated using the Gold price quote on day t.

The Gold price quote on day t taken from the price of the last standard (250g) contract lot traded at B3 for the day.

In the event that there was no standard Gold Spot contract lot (250g) traded on day t, the price will be determined using the previous day's price corrected using the variation in the Gold-Dollar per troy ounce closing price quote in New York (XAU) (converted to Brazilian Reais, using the closing price of the spread between the real Dollar on the previous day and the current day, rounded to 3

103

decimal places, according to equation (4.12). If the spot Gold order(s) occurred on the day, the amount calculated for Gold must be limited to the order values, in a manner similar to that described in the General Provisions section.

$$Gold_t = Gold_{t-1} \times \frac{Gold_{XAU,t} \times Gold_{CL,t}}{Gold_{XAU,t-1} \times Gold_{CL,t-1}} \qquad (4.12)$$

Where:

$Gold_t$: Gold quote on date *t, rounded to the third decimal place;*

$Gold_{t-1}$: Gold quote on date *t-1*;

$Gold_{XAU,t}$: Dollar-Gold closing quote in New York (XUA) on date *t;*

$Gold_{XAU,t-1}$: Dollar-Gold closing quote in New York (XUA) on date *t-1*;

$Gold_{CL,t}$: Real Dollar closing quote on date *t;*

$Gold_{CL,t-1}$: Real Dollar closing quote on date *t-1*.

4.9   Cash Settled FOB Santos Soybean Futures (S&P GLOBAL PLATTS)

The settlement price of the FOB Santos Soybean Futures Contract (SOY) is expressed in US dollars per 34 metric tons, to two decimal place rounded to the second decimal place.

Procedure Sequence to determine the settlement price for a given expiration of the contract

P1. The settlement price will be calculated using the average price of **valid trades** within the **average calculation window** according to the parameters shown in Table 7 of the Monthly Parameters Annex for the contract.

104

P2. If procedure P1 cannot be applied, the settlement price for the expiration in question will be the average **valid bid** prices and **valid ask** prices with **valid bid-ask spreads** for that expiration as per the parameters stipulated in Table 7 of the Monthly Parameters Annex.

P3. If it is not possible to apply procedure P2, the settlement prices of all SOY maturities are calculated from the settlement prices of the respective maturity of the CME Group (SAS South American Soybean futures) contract, according to equation (4.13).

$$PA_{SOY^n,t} = PA_{SAS^n,t} \qquad (4.13)$$

where:

$PA_{SOY^n,t}$ = settlement price for the n-th SOY expiration on trading session t, rounded to the second decimal place;

$PA_{SAS^n,t}$ = CME Group (SAS) South American Soybean Futures settlement price with the same maturity as SOY on trading session t;

The price determined by P3 (theoretical price) will be validated by **valid** bid or ask orders that have not generated an average price.

During the trading month before the expiration date, the settlement price of the first expiration will be calculated using the average, as per equation (4.14):

$$PA_{SOY^n,t} = \alpha_N \times PA_{SOY^n,t}^{P1-P3} + (1 - \alpha_N) \times Media\ Indicator\ Platss_N \qquad (4.14)$$

Where:

105

$N\ is$ the number of trading sessions that have already taken place in the calculation period of the Platts settlement indicator

α_N : The proportion corresponding to the term for the expiration of the contract;

$PA_{SOY^n,t}^{P1-P3}$: The reference price for this expiration, obtained from the sequence of procedures (P1, P2 and P3);

$Media\ Indicator\ Platss_N$ is the average of the Price Assessments published by Platts within the indicator calculation period. If the indicator corresponding to day N is not available until the time of calculation of the settlement price, $PA_{SOY^n,t}^{P1-P3}$ for that day the calculation of the average will be considered.

Note: *The calculation period will start on the first day of the month prior to the reference month and will end on the last trading day (the day before the expiration date, on the fifteenth day of the month prior to the reference month).*

5   SOVEREIGN DEBT INSTRUMENTS

5.1   Ten-Year U.S. Treasury Note Futures Contract (T10)

The settlement price for the Ten-Year U.S. Treasury Note Futures Contract (T10) is expressed in U.S. Dollars per unit.

The settlement prices of all T10 maturities are calculated on the hour, according to the parameters in Table 10 of the Monthly Parameters Annex, based on the settlement prices of the respective maturities of the United States 10-Year Treasury Note Futures contract truncated in the fourth decimal place.

On the last day of contract negotiation, the settlement price is defined by the first trade made at 11 am in New York or the closest after.

On the day the contract is settled, the value of the last trading day is used.

6 FINAL PROVISIONS

Valid from 1st version: 03/02/2015

Id say- constributors

Production	Superintendência de Apreçamento
Revision	Diretoria de Administração de Risco
Approval	Diretoria Executiva

Change log

Version	Item	Issue	Justification	Date
1	NA	NA	NA	02/24/2015
2	Addition	New contracts	Completing the manual	03/31/2020
3	Section 3.1.1	Average calculation time period	New calculation time	06/22/2020
4	Section 3.3.2	First open expiration on the last trading day – Including *Ticker* BBG	Make the calculation price and disclosure time explicit	06/26/2020
5	Section 3.9	Change in equation (3.19)	Update	03/01/2022
	Section 1.7	Change in DAP pricing formula	Methodology improvement	
	Section 4.10	SOY contract	Adding new contract	
6	Section 4.4.10	SOY tuning methodology	Change in the Fallback rule (P3) of the contract.	02/21/2022
7	Section 3.1.1 3.1.4	Description of the calculation window time	Change of schedule for the annex of monthly parameters - Table 10.	03/11/2022
7	Section 5.5.1	Description of the calculation window time	Change of schedule for the annex of monthly	03/11/2022

			parameters - Table 11.	
8	All Sections	Document UpDate	inclusion of rounding and truncation criteria in calculations	07/04/2022
9	Section 3.9. 3.9.1 3.9.2	Stock Future Calculation Methodology	Withdrawal of procedures P1 and P2. It is now calculated using a non-arbitrage model, Fallback. According to OC 109/2022 - PRE	31/08/2022
10	Section 3.1.1 4.1 4.2 4.3 4.4 4.6 4.7 4.9 5.1	Update of reference tables.	Modifications of Table Numbering.	09/09/2022
11	Section 3.10, 3.11 and 3.12	Introduction.	Adding new contract.	12/12/2022

	General provisions Section 1.1	VWAP DI1 contract	Adding new method Changes on P1 and P2	
12	Section 2	Removal	Word Libor Indicator Calculation period Change	06/01/2023
13	Section 2.16.1, 2.21 and 2.22	Change	Composite Rate provider changed	14/02/2023
14	Section "Market Pricing" Section 2	Change Change and Inclusion	Change in the formulas of valid spread and VWAP Change in the references of previous sections; Inclusion of the methodology in case of unavailable of rate in foreign market	03/09/2023
15	Section 2.16.1	Inclusion	Use of FX Forward Swap contract	01/06/2023
16	Section "Market Pricing" in General	Change and Inclusion	Inclusion of the new methodology and equations for the "Volume Weighted Average	

	Provisions		Price at the End of the Closing Call"	31/07/2023
	Section 1.8	Change	Change in the Future DAP methodology in P2 and P3	