BANCO CENTRAL DO BRASIL

CIRCULAR 3,634 OF MARCH 4, 2013

> Establishes procedures for calculating the component of risk-weighted assets (RWA) relative to exposures subject to the variation in fixed interest rates denominated in *reais*, for which capital requirement is calculated using the standardized approach (RWA$_{JUR1}$), as instituted by Resolution 4,193 of March 1, 2013.

The Board of the Central Bank of Brazil, in a special meeting held on March 1, 2013, based on the provisions of arts. 9, 10, item IX, and 11, item VII of Law 4,595 of December 31, 1964, and in arts. 3, paragraph 2, and 15 of Resolution 4,193 of March 1, 2013,

R E S O L V E D:

Art. 1. The calculation of the daily value of the component of risk-weighted assets (RWA) relative to exposures subject to a variation in fixed interest rates denominated in *reais*, for which capital requirement is calculated using the standardized approach (RWA$_{JUR1}$), as instituted by Resolution 4,193 of March 1, 2013, is based on the following formula:

$$RWA_{JUR1} = \frac{1}{F} \cdot \left\{ \max\left[\left(\frac{M^{pre}_{t-1}}{60} \sum_{i=1}^{60} VaR^{Padrão}_{t-i} \right), VaR^{Padrão}_{t-1} \right] + \max\left[\left(\frac{1}{60} \sum_{i=1}^{60} sVaR^{Padrão}_{t-i} \right), sVaR^{Padrão}_{t-1} \right] \right\}$$

in which:

I – F = factor set forth in art. 4 of Resolution 4,193 of 2013;

II – M$^{pre}_t$ = multiplier for day "t", published daily by the Central Bank of Brazil and determined as a decreasing function of volatility, whose value varies between 1 and 3;

III – VaR$_t^{Padrão}$ = value at risk, expressed in *reais*, of the set of exposures referred to in the heading for day "t", obtained according to the following formula:

$$VaR_t^{Padrão} = \sqrt{\sum_{i=1}^{n} \sum_{j=1}^{n} VaR_{i,t} \times VaR_{j,t} \times \rho_{i,j}} \text{ , in which:}$$

a) n = 10 (number of vertices P$_i$);

b) VaR$_{i,t}$ = value at risk, expressed in *reais*, assigned to the vertex P$_i$ on day "t", obtained according to the following formula:

$$VaR_{i,t} = 2{,}33 \times \frac{P_i}{252} \times \sigma_{i,t} \times VMTM_{i,t} \times \sqrt{D} \text{ , in which:}$$

1. P_i = vertex considered for the purpose of grouping cash flows, in accordance with procedures described in art. 3 of this Circular;

2. $\sigma_{i,t}$ = standard volatility for the period "i" and day "t", published daily by the Central Bank of Brazil;

3. $VMTM_{i,t}$ = algebraic sum, positive or negative, expressed in *reais*, of the values of cash flows marked to market on day "t" and allocated to vertex P_i, in accordance with procedures described in art. 3 of this Circular; and

4. D = 10 (number of days deemed necessary to liquidate the position);

c) $\rho_{i,j}$ = correlation between the vertices "i" and "j" used for determining the effect of $VaR_t^{Padrão}$, obtained according to the following formula:

$$\rho_{i,j} = \rho + (1-\rho)^{\left(\frac{\max(P_i,P_j)}{\min(Pi,Pj)}\right)^k}$$, in which:

1. ρ = base parameter for calculating $\rho_{i,j}$, published on the last business day of each month or at any time at the discretion of the Central Bank of Brazil; and

2. k = correlation decay factor, published on the last business day of each month or at any time at the discretion of the Central Bank of Brazil;

IV − $sVaR_t^{Padrão}$ = stressed value at risk, expressed in *reais*, of the exposures referred to in the heading for day "t", obtained according to the following formula:

$$sVaR_t^{Padrão} = \sqrt{\sum_{i=1}^{n} \sum_{j=1}^{n} sVaR_{i,t} \times sVaR_{j,t} \times \rho_{i,j}^{S}}$$, in which:

a) n = 10 (number of vertices P_i);

b) $sVaR_{i,t}$ = stressed value at risk, expressed in *reais*, assigned to the vertex Pi on day "t", obtained according to the following formula:

$$\rho_{i,j}^{S} = \rho^S + (1-\rho^S)^{\left(\frac{\max(P_i,P_j)}{\min(Pi,Pj)}\right)^{kS}}$$, in which:

1. P_i = vertex considered for grouping cash flows, in accordance with procedures described in art. 3 of this Circular;

2. σ_i^S = standard volatility assigned to vertex "i" used to calculate the $sVaR_{i,t}$;

3. $VMTM_{i,t}$ = sum, positive or negative, expressed in *reais*, of values of cash flows marked to market on day "t" and allocated to vertex P_i, in accordance with procedures described in art. 3 of this Circular;

4. D = 10 (number of working days deemed necessary to liquidate the position);

c) $\rho_{i,j}^S$ = correlation between the vertices "i" and "j", used to determine the effect of $sVaR_t^{Padrão}$, obtained according to the following formula:

$$\rho_{i,j}^{S} = \rho^{S} + (1-\rho^{S})^{\left(\frac{\max(P_i,P_j)}{\min(Pi,Pj)}\right)^{kS}} \quad , \text{ in which:}$$

1. ρ^S = base parameter for calculating the correlations used in $sVaR_t^{Padrão}$; and

2. k^S = decay factor for calculating the correlations used in $sVaR_t^{Padrão}$.

Paragraph 1. The calculation referred to in the heading applies to transactions subject to variations in fixed interest rates relating to financial instruments denominated in *reais* and registered in the trading book, in accordance with Resolution 3,464, of June 26, 2007, including derivatives.

Paragraph 2. The values of σ_i^S, ρ^S e k^S will be published by the Central Bank of Brazil.

Paragraph 3. For the purpose of determining $VMTM_{i,t}$, a vertex is defined as the date P_i to which cash flows must be allocated or grouped.

Art. 2. To determine the daily value of RWA_{JUR1}, each cash flow is defined as the net value of long positions and short positions that mature on a given day, relative to the set of open operations on the immediately preceding business day.

Paragraph 1. Cash flows must be obtained by decomposing each open operation in an equivalent term structure of payments and receipts, considering the contracted dates of maturity.

Paragraph 2. The number of cash flows shall correspond to the number of maturity dates in which the net results calculated according to this article are different from zero.

Paragraph 3. The values of assets and liabilities of the cash flow must include the principal, interest and other amounts related to each operation.

Paragraph 4. The values of assets and liabilities of the cash flow must be marked to market by using of a term structure of interest rates which represent the prevailing rates in the market on the immediately preceding business day.

Paragraph 5. The operations without a defined maturity or with a maturity that depends on the application of specific contractual clauses must have their corresponding cash flows obtained in accordance with consistent criteria that can be verified by the Central Bank of Brazil.

Paragraph 6. For the purpose of obtaining cash flows of derivatives, the following criteria should be observed:

I - in the case of swaps, the treatment of the position referenced in *reais* and in fixed-interest rates must be identical to the one provided to a security with a fixed-rate return and the same maturity of the swap, whose redemption value is the resulting final value for the fixed position in *reais*;

II - in the case of term and of future contracts referenced in *reais* and in a fixed-interest rate, the corresponding treatment should be identical to the one provided to a security with a fixed-rate return, with the same maturity date of said contracts, whose redemption value is the same value of these contracts;

III - in the case of a future settlement of transactions involving a fixed-income security, the treatment should be identical to the one provided to a pair of opposing positions in fixed-rate bonds, where:

a) one is represented by a security with a maturity coinciding with the transfer to the purchaser of the ownership of the security object of the operation, whose redemption value should be the transaction value; and

b) the other is represented by a security with the same maturity date of the securities object of the operation, whose redemption value must be the redemption value of the latter; and

IV - in the case of options referenced in *reais* and in fixed-interest rates:

a) the value of each position must be obtained by multiplying the number of contracts by their size and by the change in the price of option relative to a change in the price of the underlying asset (delta); and

b) the cash flows relative to each operation must be obtained separately, and their outcome must be included in the cash flow of the maturity date of the contract.

Paragraph 7. An exemption applies to cash flows arising from credit derivatives used as a hedge to the adjustment to the market value of derivatives as a result of change in the credit quality of the counterparts (CVA).

Paragraph 8. The values of positions held as a result of acquisition of shares of investment funds must consider the proportional composition of their portfolios or, if not feasible, they must be treated as a position subject to the variation of fixed-interest rates and allocated to vertex P10 as defined in art. 3 of this Circular.

Art. 3. Cash flows must be grouped in the following vertices P_i, according to the number of business days remaining until their maturity (T_i):

I - P_1, corresponding to 21 business days;

II - P_2, corresponding to 42 business days;

III - P_3, corresponding to 63 business days;

IV - P_4, corresponding to 126 business days;

V - P_5, corresponding to 252 business days;

VI - P_6, corresponding to 504 business days;

VII - P_7, corresponding to 756 business days;

VIII - P_8, corresponding to 1,008 business days;

IX - P_9, corresponding to 1,260 business days; and

X - P_{10}, corresponding to 2,520 business days.

Paragraph 1. Cash flows with a maturity under 21 business days must be allocated in the vertex P_1 in a proportion corresponding to $T_i/21$ of its marked-to-market value.

Paragraph 2. Cash flows with a maturity above 2,520 business days must be allocated in the vertex P_{10}, in a proportion corresponding to $T_i/2.520$ of its marked-to-market value.

Paragraph 3. Cash flows with a maturity ranging between 21 and 2,520 business days must be allocated in the previous (P_i) and subsequent (P_j) vertices, according to the following criteria:

I – the ratio (P_j − T_i) / (P_j − P_i) of the marked-to-market value of the cash flow must be allocated in the vertex P_i; and

II – the ratio (T_i − P_i) / (P_j − P_i) of the marked-to-market value of the cash flow must be allocated in the vertex P_j.

Art. 4. The methodology for calculating the rates used in marking to market the exposures subject to variations in fixed interest rates denominated in *reais* must be based in consistent and verifiable criteria, in accordance with the rules in force.

Paragraph 1. Operations in which the institution acts exclusively as a mediator and does not assume any rights or obligations with parties do not enter the base for calculating the RWA_{JUR1}.

Paragraph 2. The consolidated calculation of the RWA_{JUR1} is imputed to the institution in charge of forwarding accounting information to the Central Bank of Brazil.

Art. 5. A report detailing the calculation of the RWA_{JUR1} amount must be forwarded to the Central Bank of Brazil, in accordance with the form to be established.

Sole paragraph. Institutions must keep available to the Central Bank of Brazil for five years the data used to calculate the daily value of RWA_{JUR1}, as well as the methodology used to calculate the market value of involved transactions.

Art. 6. This Circular enters into force on October 1, 2013.

Art. 7. The following regulations shall be revoked as of October 1, 2013:

I - Circular 3,361 of September 12, 2007;

II - Circular 3,498 of June 28, 2010; and

III - Circular 3,568 of December 21, 2011.

Sole paragraph. The citations to Circular 3,361 of 2007, are replaced with a reference to this Circular.

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