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e-mail: global@cbonds.info, pro@cbonds.info | <https://www.cbonds.com>

APPROVED

By the order of CEO of Cbonds LLC

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CBONDS INDICATIVE QUOTES METHODOLOGY FOR BONDS AND EUROBONDS: CBONDS ESTIMATION

for calculation of a single indicative price on bonds and Eurobonds

1. Objectives and key principles of indicative estimation of market bonds and Eurobonds

1.1. The objective for calculating Cbonds indicative quotes on market-traded bonds and Eurobonds (hereinafter – Indicative quotes) is daily selection of asset quotes, which, according to research and expert evaluation by Cbonds.com (hereinafter – Cbonds), are in maximum correspondence with the existing market conditions and trends of demand and supply.

1.2. In this Cbonds Indicative Quotes Methodology for Bonds and Eurobonds “Cbonds Estimation” (hereinafter – Methodology), market-traded bonds and Eurobonds are the assets with regularly updated bid and/or ask quotes in any of the below-listed markets:

1.2.1. stock exchange trading floors: quotes by stock exchange trading floors posted daily on Cbonds website in the section "[Quotes by trading systems](#)";

1.2.2. OTC market: quotes by market participants posted daily [on Cbonds website on the issue pages](#) regardless of whether these quotes are unconditional public offers or indicative valuations by quote vendors with no legal effect. Offer suppliers are stock exchange trading floors and OTC market participants (hereinafter – Quote vendors)

1.3. The end result of the Methodology application is a single Indicative quote for each asset, which is based on bid and ask data from various Quote vendors.

1.4. Indicative quotes are posted on Cbonds website in line with the regulation described in the cl.5 hereof.

2. General terms and definition

2.1. The indicative quotation is built on a daily basis based on the closed prices of the trading day on exchange trading floors working with the relevant instrument, and quotes of OTC market participants as of 23.59 (Moscow time) of the corresponding day (hereinafter referred to as the Quotation Date).

2.2. All bonds¹ and Eurobonds for which there are bid and ask quotes from at least one Quote Provider are subject to quotation.

2.3. For the purposes of selecting from a set of quotes different Quote Providers, the latter are assigned the priorities of their quotes.

2.3.1. The priority of exchange trading platforms is established as follows:

2.3.1.1. Exchanges included in the list of exchange trading platforms used to calculate Cbonds Valuation indicative quotes are arranged in accordance with the procedure described in Annex 2 to the Cbonds Valuation methodology.

2.3.1.2. Priorities for other exchanges are set by the composition of the Working group or by the composition of the Extended Working group according to the number of listed securities on the exchange, liquidity, significance and reputation of the trading floor for the analyzed market segment.

2.3.2. The priority of OTC market participants is set in descending order of their bid for each instrument.

2.3.3. The priorities of the Quote Providers are reviewed at least once a quarter. In some cases, a special decision on revision is made.

2.3.4. The current priorities of Quote Providers for individual issues can be provided upon individual request.

2.3.5. In accordance with the ranking of priorities, Quote Providers are assigned serial numbers (from 1 (for the highest priority) to N (for the lowest), where N is the total number of exchange trading floors; and from N+1 (for the highest priority) to N+M (for lowest), where M is the total number of OTC market participants).

2.4. All OTC market participants that meet the condition of clause 2.4.1 (see below), as well as all exchange trading platforms, are included in the total number (N + M) of Quote Suppliers for this asset:

2.4.1. Cbonds has access to quotes from these OTC market participants on a daily basis for at least 10 days out of the last 30 calendar days before the Quote Date ((if the interval from the beginning (end) of the placement to the quote date was less than 30 calendar days, instrument quotes from this OTC market participant must be available at least one third days of the interval from the date of the beginning (end) of the placement to the quote date).

2.5. Cbonds reserves the right to exclude a Quote Provider from the list of Quote Providers for specific assets without explanations.

3. Selecting preliminary indicative pair quote when comparing pair quotes of stock exchange trading floors

3.1. Preliminary indicative paired bid and ask quotes of Cbonds (hereinafter referred to as Preliminary quotes) are selected by successively comparing pairs of bid and ask quotes of exchange trading platforms in accordance with their priority. A pair of bid and ask quotes from an exchange trading floor with a priority equal to 1 (in accordance with the priority set in accordance with paragraph 2.3 of this Methodology) is accepted as a Preliminary Quote. In subsequent calculations, the Preliminary Quote priority is always assumed to be 1.

¹ Excluding Russian Excluding Russian domestic bonds of Russian issuers.

3.2. If the number of exchange trading floors (N) is greater than 1, then the Preliminary quotation is compared with a pair of bid and ask quotes of the exchange trading floor next in priority, and a new Preliminary quotation is determined in accordance with clause 3.3. of this Methodology. The comparison continues until all N exchange trading floors are enumerated in this way.

3.3. The new Preliminary Quote is selected on the basis of the principle of selecting consistent bid b_1 and ask a_1 quotes of the Preliminary quote received earlier, and a pair of bid b_2 and ask a_2 quotes of the exchange trading floor, where the following are recognized as consistent:

3.3.1. a pair of quotes bid b_1 and ask a_1 relative to a pair of quotes bid b_2 and ask a_2 , if there are inequalities $0 \leq b_1 \leq b_2 \leq a_2 \leq a_1 \leq \infty$; In this case, a pair of quotations bid b_2 and ask a_2 is recognized as a preliminary quotation; Hereinafter, it is assumed, for example, and/or in case the supplier fails to provide the relevant quotes.

3.3.2. a pair of quotes bid b_1 and ask a_2 in relation to a pair of quotes bid b_2 and ask a_1 , if there are inequalities $0 \leq b_2 \leq b_1 \leq a_2 \leq a_1 \leq \infty$; In this case, a pair of quotations bid b_1 and ask a_2 is recognized as a preliminary quote;

3.3.3. a pair of quotes bid b_2 and ask a_1 in relation to a pair of quotes bid b_1 and ask a_2 , if there are inequalities $0 \leq b_1 \leq b_2 \leq a_1 \leq a_2 \leq \infty$; In this case, a pair of quotations bid b_2 and ask a_1 is recognized as a preliminary quote;

3.3.4. a pair of quotes bid b_1 and ask a_1 in all other cases; In this case, a pair of bid b_1 and ask a_1 quotes is recognized as a preliminary quote.

4. Selecting the final indicative pair bid and ask Cbonds quote when comparing the Preliminary Quote with quotes from OTC market participants

4.1. The final indicative bid and ask pair quote of Cbonds (hereinafter referred to as the Final Quote) is selected by successive comparison of the Preliminary Quote and bid and ask quotes of OTC market participants in accordance with their priority.

4.2. The Preliminary Quote received at the stage earlier is taken as the Final Quote.

4.3. If the number of OTC market participants (M) is more than zero, then the Total Quote is compared with a pair of bid and ask quotes of the OTC market participant next in priority, and a new Total Quote is determined in accordance with clause 4.4. of this Methodology. The comparison continues until all M OTC market participants are enumerated in this way.

4.4. The new Final Quote is selected based on the principle of selecting consistent bid b_1 and ask a_1 quotes of the Final Quote received earlier and a pair of b_2 and ask a_2 quotes of an OTC market participant, where the following are recognized as consistent:

4.4.1. a pair of quotes bid b_1 and ask a_1 in relation to a pair of quotes b_2 and ask a_2 , if there are inequalities $0 \leq b_1 \leq b_2 \leq a_2 \leq a_1 \leq \infty$; The final quote in this case is a pair of quotes bid b_2 and ask a_2 ;

4.4.2. a pair of quotes bid b_1 and ask a_2 in relation to a pair of quotes bid b_2 and ask a_1 , if there are inequalities $0 \leq b_2 \leq b_1 \leq a_2 \leq a_1 \leq \infty$; The final quote in this case is a pair of quotes bid b_1 and ask a_2 ;

4.4.3. a pair of quotes bid b_2 and ask a_1 in relation to a pair of quotes bid b_1 and ask a_2 , if there are inequalities $0 \leq b_1 \leq b_2 \leq a_1 \leq a_2 \leq \infty$; The final quote in this case is a pair of quotes bid b_2 and ask a_1 ;

4.4.4. a pair of quotes bid b_1 and ask a_1 in all other cases; The final quote in this case is a pair of quotes bid b_1 and ask a_1 .

4.5. Each pair of bid and ask quotes from an OTC market participant is compared to the average of the Total bid and ask quotes of the relevant asset for the last 5 trading days prior to the Quoted Date. If at least one quote from a pair of bid and ask quotes differs from the average value, respectively, of the Total bid and ask quotes for this asset by more than 3%, then, according to the expert decision of Cbonds, a participant in the OTC market may receive a notice of probable incorrectness supplied quotes.

4.5.1. If a notice is sent to an OTC market participant about the likely incorrectness of the supplied quotes, the bid and ask quotes of the OTC market participant in relation to the relevant asset are entered in the "stop list" for up to 10 business days. During this period, they are not taken into account with any priority among the quotes used by Cbonds when constructing the Preliminary and Final quotes of the asset, and the OTC market participant is not included in the total number of Quote Providers for this asset;

4.5.1.1. If a satisfactory response to the notification is not received by Cbonds within 10 working days, then the OTC market participant is excluded from the list of Quote Providers for the asset. At the same time, a notification is sent to him about the possible exclusion from the list of Quote Providers for all other assets, for which he provides quotes to Cbonds. The decision on this is made by Cbonds expert not earlier than 10 working days after the notification is sent.

4.5.1.2. The decision to re-include an OTC market participant as a Quote Provider is made on a general basis.

4.6. If on the Quotation Date for the issue there is no Preliminary Quote obtained on the basis of data from exchange trading platforms, and there is data from OTC market participants whose at least one quote from a pair of bid and ask quotes differs from the average value of the Final bid and ask for the relevant asset over the last 5 trading days prior to the Quotation Date by more than 3% for this asset, then such OTC market participants are not included in the total number of Quote Providers for this asset.

4.7. The final average indicative Cbonds quotes are assumed to be equal to the arithmetic mean of the Final bid and ask quotes.

5. Procedure of calculating & displaying Indicative Quotes on the Cbonds website

5.1. Final quotes: average, bid and ask are published daily at 09.00 (Moscow time) of the trading day following the Quotation Date on the Cbonds website:

5.1.1. on the pages of bonds and eurobonds of the Cbonds website in the "Exchange and OTC quotes" section - "Cbonds Estimation";

5.1.2. on the page <https://cbonds.com/quotes/> for the Cbonds Estimation trading floor.

5.2. Quotes for individual issues may be published, upon expert decision of Cbonds, after 9.00 (Moscow time) of the day following the Quotation Date, but no later than 11.00 (Moscow time) of the day following the Quotation Date.

Timeline of amendments to the Cbonds Estimation Methodology for Indicative Cbonds Quotations

1. On 24.04.2015 paragraph 4.6 was added

4.6 If on the Quotation Date for the issue there is no Preliminary Quote obtained on the basis of data from exchange trading platforms, and there is data from OTC market participants whose at least one quote from a pair of bid and ask quotes differs from the average value of the Final bid and ask for the relevant asset over the last 5 trading days prior to the Quotation Date by more than 3% for this asset, then such OTC market participants are not included in the total number of Quote Providers for this asset.

2. On 26.01.2015 paragraph 2.4.1 was updated

Before the update:

2.4.1. Cbonds has access to asset quotes from the supplier on a daily basis for at least 15 days out of last 30 calendar days before the quote date (if the interval from the beginning (end) of the placement to the quote date was less than 30 calendar days, asset quotes from the supplier must be available at least for half of days in the interval from the date of the beginning (end) of the placement to the quote date).

After the update:

2.4.1. Cbonds has access to asset quotes from the supplier on a daily basis for at least 10 days out of last 30 calendar days before the quote date (if the interval from the beginning (end) of the placement to the quote date was less than 30 calendar days, asset quotes from the supplier must be available at least for one third of days in the interval from the date of the beginning (end) of the placement to the quote date).

3. Since 20.08.2015 the publication and calculation of indicative quotes on ruble bonds (in case of improving quotes from Moscow Stock Exchange) have been performed. The text of marginal note 3 on page 2 was updated.

Before the update:

Excluding Russian domestic bonds of Russian issuers.

After the update:

Excluding Russian local bonds listed on Moscow Stock Exchange, which are market-traded (quoted in the stock exchange market and OTC market), and whose bid/ask prices with narrower range than on Moscow Stock Exchange cannot be provided by the pricing center.

4. On 10.09.2015 paragraph 4 was updated

Before the update:

4. Calculation of (final) indicative Cbonds quotes by sequential comparison of pairs of contributors

4.1. Based on bid and ask quotes by $n \geq 2$ each group of contributors with the lowest sequence number (p. 2.3.), Cbonds calculates preliminary group quotes bid and ask:

4.1.1. when $n = 2$: Cbonds preliminary group bid and ask quotes are taken to be equal to Cbonds preliminary pair quotes (p.3) calculated for the pair of contributors with the highest quote priority (sequence numbers 1 and 2);

- 4.1.2. when $n > 2$: Cbonds group preliminary bid and ask quotes are taken to be equal to Cbonds preliminary pair quotes (p. 3), calculated for an imaginary pair of contributors, the first of which provides quotes bid and ask equal to Cbonds group preliminary bid and ask quotes calculated for a group of $n - 1$ contributor, and the second is the contributor with a sequence number equal to n .
- 4.2. Final Cbonds indicative bid and ask quotes are taken to be equal to preliminary group quotes (p. 4.1) constructed for a group of all $n = N$ providers of the asset quotes (paragraph 2.3.).
- 4.3. Final average Cbonds indicative quotes are taken to be equal to the arithmetic mean of the final bid and ask quotes (p. 4.2).

After the update:

4. Calculation of (final) indicative Cbonds quotes by sequential comparison of preliminary quotes with quotes from contributors
 - 4.1. Final indicative bid and ask Cbonds pair quotes are based on the principle of selecting consistent bid and ask quotes between preliminary indicative quote and quotes from contributors, where consistent quotes are considered to be:
 - 4.1.1. preliminary indicative quote bid b_1 and ask a_1 relative to the pair of quotes bid b_2 and ask a_2 by a contributor, if the following inequations are valid: $0 \leq b_1 \leq b_2 \leq a_2 \leq a_1 \leq \infty$; final indicative bid and ask Cbonds pair quotes in this case are b_2 and ask a_2 ;
 - 4.1.2. preliminary indicative quote bid b_1 and ask a_1 relative to the pair of quotes bid b_2 and ask a_2 by a contributor, if the following inequations are valid: $0 \leq b_1 \leq b_2 \leq a_1 \leq a_2 \leq \infty$; final indicative bid and ask Cbonds pair quotes in this case are bid 2 b and ask 1 a;
 - 4.1.3. preliminary indicative quote bid b_1 and ask a_1 relative to the pair of quotes bid b_2 and ask a_2 by a contributor, if the following inequations are valid: $0 \leq b_2 \leq b_1 \leq a_2 \leq a_1 \leq \infty$; final indicative bid and ask Cbonds pair quotes in this case are bid b_1 and ask a_2 ;
 - 4.1.4. preliminary indicative quote bid $0 \leq b_1$ and ask $a_1 \leq \infty$ in all other cases; final indicative bid and ask Cbonds pair quotes in this case are b_1 and ask a_1 .
 - 4.2. Final average indicative Cbonds quotes are considered equal to the average value of final bid and ask quotes.

5. Since 19.02.2016 we started the calculation of indicative quotes for securities with the statuses: “default on maturity”, “restructured”, “planned”, “being placed”. Earlier, the calculation was provided only for issues with the status “outstanding”.

6. On 05.05.2023 paragraph 2.3.1 was updated

Before the update:

2.3.1. The priority of exchange trading platforms is established based on the expert assessment of Cbonds.

After the update:

2.3.1. The priority of exchange trading platforms is established as follows:

2.3.1.1. Exchanges included in the list of exchange trading platforms used to calculate Cbonds Valuation indicative quotes are arranged in accordance with the procedure described in Annex 2 to the Cbonds Valuation methodology.

2.3.1.2. Priorities for other exchanges are set by the composition of the Working group or by the composition of the Extended Working group according to the number of listed securities on the exchange, liquidity, significance and reputation of the trading floor for the analyzed market segment.

7. Since 16.01.2024 the text of marginal note 3 on page 2 was updated.

Before the update:

Excluding Russian local bonds listed on Moscow Stock Exchange, which are market-traded (quoted in the stock exchange market and OTC market), and whose bid/ask prices with narrower range than on Moscow Stock Exchange cannot be provided by the pricing center

After the update:

Excluding Russian domestic bonds of Russian issuers.