



Cbonds.Ru Ltd.

Pirogovskaya nab., 21, 194044, St. Petersburg

Phone: +7 (812) 336 -97*-21, E-mail: Russia@cbonds.info

<http://www.cbonds-group.com>

**CBONDS INDICATIVE QUOTES
METHODOLOGY
FOR BONDS AND EUROBONDS: CBONDS VALUATION
for calculation of a single indicative price on bonds and Eurobonds**

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

- 1.1. The objective of calculating Cbonds quotes on market-traded bonds and Eurobonds is daily selection of asset quotes, which, according to research and expert evaluation by Cbonds.ru (Cbonds), are in maximum correspondence with the existing market conditions and trends of demand and supply, for further use in calculation of bond and Eurobond market indices.
 - 1.2. In this methodology, market-traded bonds and Eurobonds are the assets with regularly updated indicative quotes by contributors of Cbonds.ru¹, or with current (in the opinion of Cbonds) bid/ask quotes on the respective trading day in any of the below-listed markets:
 - 1.2.1. stock exchange trading floors²: EuroTLX, Frankfurt Stock Exchange, Berlin Stock Exchange, TradeGate, Italian Stock Exchange, Swiss Exchange, London Stock Exchange, Bond Spot, BPVB (Venezuela), FedInvest, KASE, MDP (Spain), Nasdaq OMX Nordic, Nasdaq OMX Armenia, Nasdaq OMX Baltic Region, NYSE Euronext, US OTC Market, XETRA, Luxembourg Stock Exchange, Oslo Bors, Selic (Brasil), Singapore OTC Market, Treasury Bond Spot Poland, Baku Stock Exchange, BCSE, Belgrade Stock Exchange, Bratislava Stock Exchange, Budapest Stock Exchange, Bucharest Stock Exchange, Warsaw Stock Exchange, Zagreb Stock Exchange, Indonesia Stock Exchange, Irish Stock Exchange, Ljubljana Stock Exchange, Malta Stock Exchange, National Stock Exchange of India, Prague Stock Exchange, PFTS, Istanbul Stock Exchange, Ukrainian Stock Exchange, Perspektiva Stock Exchange, Shanghai Stock Exchange and others.
 - 1.2.2. OTC market: quotes by market participants posted daily on Cbonds website in the section "Quotes by Market Participants" (<http://cbonds.ru/quotes/market/>).
- regardless of whether these quotes are unconditional public offers or indicative valuations by contributors with no legal effect.
- 1.3. The end result of the methodology application for each asset is a single end-of-day (final) Cbonds quote, which is based on bid and ask data from various trading floors and contributors working with this asset.
 - 1.4. Final indicative quotes are published on Cbonds website in line with the regulation cl.5.

¹ Information from the database <http://cbonds.ru/quotes/>.

² The list above may be extended in the future.

2. General conditions and definitions

- 2.1. Cbonds indicative quotes of market-traded bonds or Eurobonds are generated daily, based on closing prices on exchange trading floors working with the relevant asset, and quotes by contributing companies as at 23.59 (MSK) on the respective day (quote date).
- 2.2. Quotes are calculated for all³ market-traded bonds and Eurobonds, with which in the calendar month ending on the quote date there were deals at least on one of the stock exchanges, and/or indicative bid and ask quotes were updated (confirmed) by at least two contributors.
- 2.3. For the purpose of selecting from quotes of various trading floors and contributors (quote providers), the latter are assigned quote priority based on an expert assessment by Cbonds. In accordance with the quote priority, contributors are assigned sequence numbers (from 1 (for the highest priority⁴) to N (for the lowest), where N is the total number of contributors providing quotes for this asset on the date of quotation).
- 2.4. Contributor priorities for each paper are reviewed at least once every quarter. In some cases, Cbonds may decide to review priorities out of schedule; Cbonds reserves the right not to disclose the motives behinds the decision to assign the contributors specific priorities and/or revise them. Current contributor priorities for individual issues may be provided upon request.
- 2.5. All OTC market quote providers meeting the requirements of p.2.5.1. (see below) and all stock exchange trading floors are included in the list of N contributors of the asset:
 - 2.5.1. Cbonds has access to asset quotes from the supplier on a daily basis for at the 10 days (minimum) from 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, asset quotes from the supplier must be available at least for a third day in the interval from the date of the beginning (end) of the placement to the quote date).
- 2.6. Cbonds reserves the right to exclude a contributor from the contributor list of a specific asset (assets) without explanation.

3. Selecting preliminary indicative bid and ask Cbonds quotes when comparing quotes by pairs of providers

- 3.1. Preliminary indicative bid and ask Cbonds quotes are based on the principle of selecting consistent bid and ask quotes by pairs of providers, where consistent quotes are considered to be:
 - 3.1.1. for provider 1 with lower priority and supplier 2 with higher priority:
 - 3.1.1.1. pair of quotes bid b_1 and ask a_1 by a provider with lower priority relative to the pair of quotes bid b_2 and ask a_2 by the provider with higher priority, if the following inequations are valid: $0 \leq b_2 \leq b_1 \leq a_1 \leq a_2 \leq \infty$ ⁵; preliminary indicative bid and ask Cbonds quotes in this case are bid b_1 and ask a_1 ;
 - 3.1.1.2. pair of quotes bid b_2 by a provider with higher priority and ask a_1 by a provider with lower priority relative to the pair of quotes bid b_1 and ask a_2 , if the following inequation is valid:

³ 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 Cbonds.

⁴ If several contributors have equal quote priority, numbers are assigned in descending order of their bid quotes.

⁵ Here and elsewhere we shall assume, for example, $b_2 = 0$ and/or $a_2 = \infty$ if the contributor fails to provide the relevant quotes.

$0 \leq b_1 \leq b_2 \leq a_1 \leq a_2 \leq \infty$; preliminary indicative bid and ask Cbonds quotes in this case are bid b_2 and ask a_1 ;

3.1.1.3. pair of quotes bid b_1 by a provider with lower priority and ask a_2 by a provider with higher priority relative to the pair of quotes bid a_1 and ask b_2 , if the following inequations are valid: $0 \leq b_2 \leq b_1 \leq a_2 \leq a_1 \leq \infty$; preliminary indicative bid and ask Cbonds quotes in this case are bid b_1 and ask a_2 ;

3.1.1.4. pair of quotes bid $0 \leq b_2$ and ask $a_2 \leq \infty$ by a provider with higher priority in all other cases⁶; preliminary indicative bid and ask Cbonds quotes in this case are bid b_2 and ask a_2 .

3.1.1.5. In this case, the quote provider with lower priority, upon expert decision by Cbonds, can get a notice of possible inaccuracy of the quotes provided (see. also 3.2.2.)

3.1.2. for providers 1 and 2 with equal priority:

3.1.2.1. pair of quotes bid b_1 and ask a_1 by provider 1 relative to the pair of quotes bid b_2 and ask a_2 of the provider 2, if the following inequations are valid: $0 \leq b_2 \leq b_1 \leq a_1 \leq a_2 \leq \infty$; preliminary indicative bid and ask Cbonds quotes in this case are bid b_1 and ask a_1 ;

3.1.2.2. pair of quotes bid b_2 by provider 2 and ask a_1 by provider 1 relative to the pair of quotes bid b_1 and ask a_2 , if the following inequations are valid: $0 \leq b_1 \leq b_2 \leq a_1 \leq a_2 \leq \infty$; preliminary indicative bid and ask Cbonds quotes in this case are bid b_2 and ask a_1 ;

3.1.2.3. pair of quotes bid b_1 by provider 1 and ask a_2 by provider 2 relative to the pair of quotes bid a_1 and ask b_2 , if the following inequations are valid: $0 \leq b_2 \leq b_1 \leq a_2 \leq a_1 \leq \infty$; preliminary indicative bid and ask Cbonds quotes in this case are bid b_1 and ask a_2 .

3.2. Indicatives quotes bid b_1 and ask a_1 by provider 1 and bid b_2 and ask a_2 by provider 2 with different priorities are deemed inconsistent, if $0 \leq b_1 \leq a_1 \leq b_2 \leq a_2 \leq \infty$. In this case, the choice of the preliminary indicative paired quotes by Cbonds is made using the algorithm in paragraphs 3.2.1-3.2.2:

3.2.1. Pairs of quotes b_1 and a_1 and, respectively, b_2 and a_2 by both providers, are compared to average (final) indicative Cbonds quotes bid $\overline{b_{.5}}$ and ask $\overline{a_{.5}}$ of the respective asset for the last 5 trading days preceding the quote date.

3.2.1.1. In case if one (exactly one) quote from the pair bid b_1 and b_2 and/or one (exactly one) quote from the pair ask a_1 and a_2 differs from the average value of indicative Cbonds quotes bid $\overline{b_{.5}}$ and ask $\overline{a_{.5}}$, respectively, by more than 3%, then preliminary indicative paired quote by Cbonds bid and/or ask, respectively, shall be the arithmetic mean of the value $\overline{b_{.5}}$ and one of the quotes bid b_1 and b_2 , whichever is closest to $\overline{b_{.5}}$ in absolute value, and, respectively, the average mean of the value $\overline{a_{.5}}$ and one of the quotes ask a_1 and a_2 , whichever is closest to $\overline{a_{.5}}$ in absolute value.

3.2.1.2. In this case, the provider of quotes bid and/or ask, differing from the indicative Cbonds quotes of the previous days by more than 3%, can receive, subject to expert decision by Cbonds, a notice of possible inaccuracy of the quotes supplied (see also 3.2.2.);

3.2.1.3. If both quotes from the pair bid b_1 and b_2 and/or both quotes from the pair ask a_1 and a_2 differ from the average value of the respective indicative Cbonds quotes bid $\overline{b_{.5}}$ and ask $\overline{a_{.5}}$ of the relevant asset for the last 5 trading days preceding the quote date by more than 3%, preliminary indic-

⁶ In this case quote $a_2 < b_2$ is excluded from consideration

ative paired Cbonds quote bid and/or ask, respectively, shall be the arithmetic mean of the value b_1 and b_2 and $\overline{b_{.5}}$ and/or a_1 and a_2 and $\overline{a_{.5}}$ ⁷.

3.2.1.4. If both quotes from the pair bid b_1 and b_2 and/or both quotes from the pair ask a_1 and a_2 differ from the average value of the respective indicative Cbonds quotes bid $\overline{b_{.5}}$ and ask $\overline{a_{.5}}$ by not more than 3%, then preliminary indicative Cbonds quote is the best bid and ask closest to it.

3.2.2. If Cbonds sends a contributor a notice of possible inaccuracy of the quotes provided (paragraphs. 3.1.1.4, 3.2.1.1), the contributor's bid and ask quotes for the respective bond (Eurobond) are placed in the "stop list" for up to 10 business days. During this period, these quotes are not used, with any priority, by Cbonds in calculation of preliminary and final indicative quotes of the asset, and the contributor is not included in the list N of the asset quote providers;

3.2.2.1. if within 10 business days Cbonds does not receive a satisfactory reply to the notice, the contributor is excluded from the list of providers of this bond (Eurobond) quotes, and is simultaneously notified of the possible exclusion from the list of quote providers for all other assets quoted by Cbonds. This decision is made by Cbonds experts not earlier than 10 business days after receipt of this notice.

3.2.2.2. The decision on re-inclusion of the quote provider in the list of contributors for each asset is made on a non-preferential basis, in accordance with paragraph 2.3.

3.2.3. In case if on the quoting date there is no preliminary issue indicative quote, based on the data from exchange trading floors, but there is data from quote providers of the OTC market, whose even one out of two bid/ask quotes differs from average Cbonds bid/ask indicative quotes more than by 3% on a certain issue, then these contributors are not included in the overall number of quote providers on a certain asset.

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: $0 \leq b_1 \leq b_2 < a_2 \leq a_1 \leq \infty$; final indicative bid and ask Cbonds pair quotes in this case are bid 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: $0 \leq b_1 \leq b_2 < a_1 \leq a_2 \leq \infty$; final indicative bid and ask Cbonds pair quotes in this case are bid b_2 and ask a_1 ;
- 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: $0 \leq b_2 \leq b_1 < a_2 \leq a_1 \leq \infty$; 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 bid 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. Procedure for displaying (final) indicative Cbonds quotes on Cbonds.ru

- 5.1. Cbonds final indicative Eurobond quotes Average, Bid and Ask are published daily at 09.00 (MSK) on the trading day following the quote date on the website Cbonds.ru:
- 5.1.1. on the pages of the respective instruments in section Trading Info – **Cbonds Valuation**;
- 5.1.2. on the page <http://cbonds.ru/quotes/>, in section Trading Systems' Quotes under **Cbonds Valuation**.
- 5.2. Quotes for individual issues can be published, subject to expert decision by Cbonds, after 9.00 (MSK) on the trading day following the quote date, but not later than 11.00 (MSK) on such day.

Contact details:

Sergey Lyalin, Ph.D., General Director, Cbonds.ru, ph/fax: (812) 336 9721
Konstantin Vasilyev, Ph.D., Head of Cbonds Department, ph/fax: (812) 336 9721, ext.105;
e-mail: kv@cbonds.info
Elena Skurikhina, Head of Projects, ph/fax: (812) 336 9721, ext.118;
e-mail: sea@cbonds.info

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**History of revisions to Cbonds Indicative Quotes Methodology for Bonds and Eurobonds
“Cbonds Valuation”**

1. On 24.04.2015 paragraph 3.2.3 was added
3.2.3. In case if on the quoting date there is no preliminary issue indicative quote, based on the data from exchange trading floors, but there is data from quote providers of the OTC market, whose even one out of two bid/ask quotes differs from the average value of Cbonds bid/ask indicative quotes more than by 3% on a certain issue, then these contributors are not included in the overall number of quote providers on a certain asset.
2. On 26.01.2015 paragraph 2.5.1 was updated
Before the update:
2.5.1. 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:
2.5.1. 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. On 11.03.2015 paragraph 2.5 was updated
Before the update:
2.5. All OTC market quote providers meeting the requirements of p.2.5.1. (see below) are included in the list of contributors of the asset:
After the update:
2.5. All OTC market quote providers meeting the requirements of p.2.5.1. (see below) **and all stock exchange trading floors** are included in the list of contributors of the asset:
4. 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 issues.
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.
5. 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**
 - 4.2. 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:
 - 4.2.1. 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: $0 \leq b_1 \leq b_2 < a_2 \leq a_1 \leq \infty$; final indicative bid and ask Cbonds pair quotes in this case are bid b_2 and ask a_2 ;
 - 4.2.2. 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: $0 \leq b_1 \leq b_2 < a_1 \leq a_2 \leq \infty$; final indicative bid and ask Cbonds pair quotes in this case are bid b_2 and ask a_1 ;
 - 4.2.3. 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: $0 \leq b_2 \leq b_1 < a_2 \leq a_1 \leq \infty$; final indicative bid and ask Cbonds pair quotes in this case are bid b_1 and ask a_2 ;
 - 4.2.4. 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 bid b_1 and ask a_1 .
 - 4.3. Final average indicative Cbonds quotes are considered equal to the average value of final bid and ask quotes.
6. Since 03.02.2016 while comparing preliminary indicative quote with quotes from market participants, a strict inequality is used (see paragraph 4 of the Methodology). Earlier, all inequalities were used as unstrict ones.
7. 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”.