Regulations of

setting TBSP.Price and TBSP.fixPrice reference prices

I. General provisions

§ 1.

In order to preserve the transparency and reliability of setting TBSP.Price and TBSP.fixPrice reference prices, the Regulations shall specify the principles for the construction and setting of TBSP.Price and TBSP.fixPrice reference prices and the publication thereof and the role of BondSpot S.A. in the development thereof.

II. Definitions

§ 2

In these Regulations, the following terms shall have the following meanings:

1) Regulations - Regulations for setting **TBSP.Price** and **TBSP.fixPrice** reference prices
2) **Company** - BondSpot S.A. with its registered office in Warsaw, at ul. Książęca 4, 00-498 Warsaw, entered into the Register of Entrepreneurs of the National Court Register maintained by the District Court for the Capital City of Warsaw in Warsaw, the 12th Commercial Division of the National Court Register, under KRS number: 0000022931, with NIP tax identification number: 525-10-06-445, with the share capital in the amount of PLN 10,000,000, fully paid up;
3) **Issuer** - Minister of Finance of the Republic of Poland;
4) **Market** - Treasury BondSpot Poland market, which is an alternative trading system as defined in the Act of 29 July 2005 on Trading in Financial Instruments (i.e. Journal of Laws of 2018, item 2286, as amended), on which TS trading shall be held as organized by the Company on the basis of a contract concluded with the Issuer;
5) **TBSP Regulations** - Treasury BondSpot Poland Market Regulations;
6) **TS** - treasury securities as defined in the Act of 27 August 2009 on Public Finance (i.e. Journal of Laws of 2019, item 869) which were introduced to trading on the Market in accordance with the TBSP Regulations;
7) **Reference price** - **TBSP.Price** and **TBSP.fixPrice**;
8) **TBSP.Price** - reference price set after the end of each **TBSP.Price** Session;
9) **TBSP.fixPrice** - the final reference price set after the end of the second **TBSP.Price** Session;
10) **TBSP.Price session** - the reference period specified in the Regulations on the basis of which reference rates shall be set;
11) **Trading Day** - a business day on which trading shall take place on the Market;
12) **Transactions** - transactions as defined in the TBSP Regulations concluded in the Market Cash Segment;
13) **Transaction price** - volume-weighted average Transaction price, set in accordance with the provisions of the Annex to the Regulations;

14) **MidPrice** - a MidPrice as defined in the TBSP Regulations;
15) **Market Cash Segment** - a cash market as defined in the TBSP Regulations;
16) **Market MidPrice** - arithmetic average of the best level of Buy and Sell Offers in the Market Cash Segment;
17) **Interval price** - the price set during each Interval in accordance with the provisions of the Annex to the Regulations;
18) **Interval** - a one-minute reference period that is part of the TBSP.Price Session, based on which the Interval Price is set;
19) **MMI** - Major Market Incidents as defined in the TBSP Regulations;
20) **Market website** - www.bondspot.pl.

III. General provisions

§ 3

1. The Company shall control the development of the reference prices.
2. The Company shall define the rules for the construction of the Reference Prices and disclosing their calculated value to the public and shall supervise the course of the **TBSP.Price** Session.
3. The control over the development of Reference Prices shall cover any and all activities necessary to perform the Company's duties in relation to setting the Reference Prices in particular it shall include the following activities:
   1) management of mechanisms regarding the setting of the Reference Prices,
   2) collecting, analysing and processing data for the purposes of setting the Reference Prices,
   3) setting the Reference Prices in accordance with the Regulations.

IV. Principles for calculating and setting Reference Prices

§ 4

1. The Reference Prices shall be calculated in relation to each series of TS listed on the Market, subject to the provisions of Section 2.

2. The Reference Prices shall only be set for TS which are Treasury bonds denominated in PLN.

§ 5

1. The Reference Price shall be the information price set by the Company outside the Market understood as the price for PLN 100 of the nominal value of the TS (clean price).

2. The Reference Price shall be calculated based on the rates set in accordance with § 6 and § 7 at **TBSP.Price** sessions.

3. **TBSP.Price** sessions shall be conducted in the Market Cash Segment on Trading Days.

4. **TBSP.Price** sessions shall be conducted in accordance with the TBSP Regulations.

5. Each **TBSP.Price** session shall last 30 minutes.

6. During a Trading Day two **TBSP.Price** Sessions shall be held on the Market:

    1) the first session from 9:30 to 10:00,

    2) the second session from 16:00 to 16:30,

7. The **TBSP.Price** shall be set after the end of the **TBSP.Price** Session and then published by the Company within 15 minutes of the end of the **TBSP.Price** Session.

8. The TBSP.Price set after the completion of:

    1) the first **TBSP.Price** Session shall be the daily opening value,

    2) the second **TBSP.Price** Session shall be the daily closing value,

§ 6.

1. The Reference Price shall be set on the basis of data on Transactions concluded at **TBSP.Price** Sessions.
2. In the absence of transaction data, the Reference Price shall be set based on MidPrices and Market MidPrices.
3. In the absence of data enabling the Reference Price to be set, the Reference Price shall not be set, subject to § 7.
4. The detailed methodology for setting the Reference Prices has been set out in the Annex to the Regulations.

§ 7

1. The **TBSP.fixPrice** shall be set based on the **TBSP.Price** set at the **TBSP.Price** Session from 16.00 to 16.30 on a given Trading Day.
2. When setting the **TBSP.fixPrice**, Transactions concluded during a given **TBSP.Price** Session and subsequently cancelled by the Company after the end of the **TBSP.Price** Session, but not later than until 17.00 shall not be taken into account.
3. If it is not possible to set the TBSP.fixPrice based on the TBSP.Price at the Session from 16.00 to 16.30, the TBSP.fixPrice shall be set according to the iterative procedure set out in Section 18 of the Annex to the Regulations.
4. If it is not possible to set the **TBSP.fixPrice** on a given Trading Day, the **TBSP.fixPrice** shall be the TBSP.fixPrice from the previous Trading Day.
5. In the absence of data enabling the **TBSP.fixPrice** to be set, the TBSP.fixPrice shall be set based on the minimum sale price established for this series of TS at the sale auction or the lowest clean price accepted at the switch auction organized by the National Bank of Poland on behalf of the Issuer.
6. In the case referred to in Section 5, the price set for a given TS series at a sale or exchange auction shall not be taken into account if its introduction to trading on the Market is combined with assimilation with the TS series listed on the Market.

7. The **TBSP.fixPrice** shall be published by the Company within 15 minutes after the end of trading in TS on the Market on a given Trading Day.

V. List of TS with regard to which Reference Prices are set

§ 8

1. The Company shall publish the current list of TS with regard to which the Reference Price shall be set on the Market website.
2. The TS with regard to which the Reference Price shall be set shall be placed on the list of TS from the first day of their listing on the Market to the last day of listing on the Market.

VI. Withdrawal from the application of the Regulations

§ 9

Bearing in mind the safety of trading and the interests of its participants, the Company may withdraw from the application of specific provisions of the Regulations.

VII. Publication of Reference Prices

§ 10

1. Whenever the Regulations refer to the publication of information by the Company, this shall mean the publication thereof at least on the Market website and on information distributors' websites under the conditions specified by information distributors unless the Regulations specify the place of publication of information otherwise.
2. Information on the value of the Reference Prices is published by the Company on Trading Days with the frequency specified in the Regulations.
3. Information on the value of Reference Prices is published by the Company on the Market website 15 minutes after the publication thereof on information distributors' websites.
4. The Company shall not publish information on the value of the Reference Prices if the publication conditions specified in the method of its preparation are not met, subject to § 11.
5. Should MMI be announced by the Company on the Market or should another technical failure occur, the Company may delay the publication of information on the value of the Reference Price.
6. Should it not be possible to publish information about the value of the Reference Price or should the publication of information about the value of the Reference Price be delayed, the Company shall immediately publish such information.
7. Should, after the publication of information about the value of the Reference Price, circumstances be revealed that indicate that this price does not meet the publication

conditions specified in the method of its development, in particular due to the announcement of MMI by the Company on the Market or the occurrence of another technical failure, the Company shall immediately publish information about the cancellation of the Reference Price.

VIII. Changing the start time of the TBSP.Price Session, cancellation of the TBSP.Price Session, failure to set the Reference Price

§ 11

1. In particularly justified cases, the Company may:
   1) change the start time of the **TBSP.Price** Session, however the start time of the Session should not be set later than for:
      a) 12:00 for the first Session,
      b) 16:00 for the second Session,
   2) cancel the **TBSP.Price** Session.
2. The particularly justified cases shall include in particular:
   1) the Company's suspension of TS trading on the Market, including suspension at the request of the competent supervisory authority;
   2) normal market conditions have ceased to exist,
   3) announcement of MMI by the Company on the Market or occurrence of another technical failure,
3. The Reference Price may not be set, in particular in the case of:
   1) cancellation of a given **TBSP.Price** Session,
   2) suspension of TS trading on the Market, including suspension at the request of the competent supervisory authority;
   3) announcement of MMI by the Company on the Market or occurrence of another technical failure,
   4) lack of data enabling it to be set.
4. The Company shall immediately publish information on the occurrence of the cases referred to in Sections 1 or 3 and the reasons therefor.

IX. Company's liability

§ 12

The Company shall not be liable for damage resulting from the use of Reference Prices or other use thereof without the consent of the Company.

X. Amendment to the Regulations

§ 13

1. The Company shall have the right to amend the Regulations.
2. The amended Regulations shall be published on the Market website.
3. Amendments to the Regulations shall enter into force on the day indicated in the information about the amendment to the Regulations, though not earlier than after 7 days from the publication of the amended Regulations on the Market website, subject to Section 4.
4. The Company may decide to enter into force amendments to the Regulations before the deadline specified in Section 3 if the amendment is aimed at adapting the Regulations to applicable law or results from the decision of the competent supervision authority.

XI. Transitional provisions

§ 14.

If it is not possible to set the TBSP.fixPrice on the first Trading Day after the effective date of the Regulations, the TBSP.fixPrice shall be equal to the TBSP.fixPrice from the last Trading Day preceding the effective date of the Regulations.

Annex to the Regulations - Methodology for setting Reference Prices

1. In these Annex to the Regulations, the following terms shall have the following meanings:

    1) Interval Price Weight - a measure of validity of a given Interval Price, set in accordance with Sections 8 - 17 of the Annex to the Regulations,
    2) Transaction Price Weight - a measure of validity of a given Transaction Price depending on the total volume of Transactions concluded in a given Interval,
    3) MidPrice Weight - measure of validity of a MidPrice,
    4) Market MidPrice Weight - a measure of validity of the Market MidPrice,
    5) Threshold weight - the limit value of the total weights of Interval Prices,
    6) Time weight - a measure of validity of a given Interval Price depending on the distance of a given Interval from the end of the **TBSP.Price** Session.

2. Each **TBSP.Price** Session shall be divided into 30 one-minute Intervals. Each Interval shall start at every full minute of the **TBSP.Price** Session and shall end at the end of the given minute, excluding the last microsecond of that minute.

3. Interval Prices shall be set at each Interval. Based on the Interval Prices, the Reference Price shall be set. The Reference Price shall be the weighted average of Interval Prices.

4. In the first stage of calculating the Interval Price, Transactions concluded during a given Interval that are not cancelled during the TBSP.Price Session shall be taken into account. In the absence of Transactions concluded during a given Interval, the Transaction Price shall not be set. Transaction price (T_i) - shall be the volume-weighted average Transaction Price, set in accordance with the following formula:

$$T_i = \frac{\sum_{j=1}^{m} P_j V_j}{S_i}$$

whereby:

$$S_i = \sum_{j=1}^{m} V_j$$

T_i – the value of the Transaction Price for the i-th Interval

P_j - price for j-th Transaction

V_j - Volume for j-th Transaction

S_i - Total Transaction volumes for the i-th Interval

5. Should the Transaction Price fail to be set during the current Interval, the MidPrices (Mp_i) and the Market MidPrices (Mm_i) applicable during the Interval shall be used, equal to the time-weighted average *(Mi)* of the applicability of such Prices:
    a. MidPrices – for the periods when MidPrices were applicable,

    b.   Market MidPrices – for the periods when MidPrices were not applicable.

6. Should the market k/s spread of quotes used to set the MidPrice or the Market MidPrice exceed the value of the Maximum k/s Spread as defined in the TBSP Regulations corresponding to the maturity of the Underlying TS from the same group, the MidPrice or the Market MidPrice shall not be set. For short-term (K) instruments, the value of the Maximum k/s Spread corresponding to the value of the Maximum k/s Spread for Group A, specified in Annex G to the TBSP Regulations, shall be applied.

7. Should, during a given Interval the Transaction Price fail to be set and the MidPrice Price fail to be set and the Market MidPrice fail to be calculated, the Interval Rate shall not be set and shall not be included in the Reference Price calculation process.

8. The weight of the Transaction Rate Wt_i shall be determined based on the value of turnover of individual TS, separately for sets of TS belonging to individual groups depending on the maturity date of individual TS set in accordance with Annex A to the TBSP Regulations.

    a.   For short-term instruments

        i.   1 for $S_i < KQ_1$

        ii.   1.5 for $KQ_1 \leq S_i < KQ_2$

        iii.   2 for $KQ_2 \leq S_i < KQ_3$

        iv.   3 for $S_i \geq KQ_3$

    b.   For Group A

        i.   1 for $S_I < AQ_1$

        ii.   1.5 for $AQ_1 \leq S_i < S_2$

        iii.   2 for $AQ_2 \leq S_i < AQ_3$

        iv.   3 for $S_i \geq AQ_3$

    c.   For Group B

        i.   1 for $S_i < BQ_1$

        ii.   1.5 for $BQ_1 \leq S_i < BQ_2$

        iii.   2 for $BQ_2 \leq S_i < BQ_3$

        iv.   3 for $S_i \geq BQ_3$

    d.   For Group C

      i.   1 for $S_i < CQ_1$

      ii.   1.5 for $CQ_1 \leq S_i < CQ_2$

      iii.   2 for $CQ_2 \leq S_i < CQ_3$

      iv.   3 for $S_i \geq CQ_3$

e. For Group D

      i.   1 for $S_i < DQ_1$

      ii.   1.5 for $DQ_1 \leq S_i < DQ_2$

      iii.   2 for $DQ_2 \leq S_i < DQ_3$

      iv.   3 for $S_i \geq DQ_3$

whereby:

GrQ_k – k-th quartile of the Interval distribution, for which the value of turnover for individual TS belonging to a given group has reached a certain level.

9.   The quartiles shall be determined in the ordered U set of the total turnover values of individual TS during the Interval by indicating the order number (index) of the value. The following indexes shall be used for individual quartile values:

$$I_1 = \lceil |U| \times 0,25 \rceil$$

$$I_2 = \lceil |U| \times 0,50 \rceil$$

$$I_3 = \lceil |U| \times 0,75 \rceil$$

Whereby:

- I_k – element index for the k-th quartile;
- U – ordered set of total turnover during the Interval for individual groups of instruments;
- $|U|$ – number of elements of the U set (set power);
- $\lceil x \rceil$ – upper attribute of the x number.

10. To calculate the value of turnover in given Intervals, only Transactions that have not been cancelled shall be used. Statistical characteristics shall be determined at the level of the whole group and shall relate to individual TS belonging to this group. In the case of determining the distribution characteristics at an equal level, the highest weight shall be assigned for a given group.

11. Quartiles shall be set on the basis of an analysis based on the data from the previous four quarters (observation period) and shall be effective from the beginning of the quarter following the quarter in which data from the observation period is analysed. In the absence of Transactions during the four preceding quarters, the quartiles shall

be set based on the data from the last quarter in which the Transactions were concluded.

12. Quartiles shall be published at least one month in advance as of their validity on the Market website. The quartiles shall be reviewed once a quarter.

13. The MidPrice weight (Wp_i) shall be 0.95.

14. The Market MidPrice weight (Wm_i) shall be 0.80.

15. If an Interval Price is set using MidPrices and Market MidPrices applicable during an Interval, the Threshold Weight for the Interval Price shall be equal to the time-weighted average (W_i) of the weights referred to in Sections 13 and 14 for the time when the MidPrices and Market MidPrices were applicable, respectively.

16. In order to calculate the Reference Price, the Threshold Weight for Interval Prices for all Intervals shall be required to be at least 12, subject to Section 17.

17. If it is not possible to set the TBSP.fixPrice for the Threshold Weight referred to in Section 16, the minimum Threshold Weight shall be equal to 2.4.

18. If it is not possible to set the TBSP.fixPrice for the Threshold Weight referred to in Section 16 and Section 17, an iterative procedure shall be followed which uses subsequent 30-minute periods preceding the Session from 16.00 to 16.30 until all parameters necessary to set the TBSP.fixPrice are met according to the standard method using Transaction Prices and, in the next step, MidPrices and Market MidPrices, provided that the minimum Threshold Weight is equal to 2.4.

19. If no Reference Price is set on a Trading Day according to Section 18, the TBSP.fixPrice set according to § 7(4) of the Regulations shall be used.

20. An additional Time Weight shall be set for each Interval Course based on the distance of a given Interval from the end time of the **TBSP.Price** Session. The time distance weights shall be defined as the square root function according to the following formula:

$$G_i = \sqrt[10]{n_i}$$

whereby:

n_i – number of the i-th Interval

G_i - Total Transaction volumes for the i-th Interval

The time weight for a given Interval shall rounded to the fourth decimal place.

21. The Reference Price shall be based on the following formula:

$$F = \frac{\sum_{i=1}^{n=30} K_i G_i W_i}{\sum_{i=1}^{n=30} G_i W_i}$$

whereby:

K_i – Interval Price set according to the following algorithm:

$$K_i = \begin{cases} T_i - when\ there\ is\ the\ Transaction\ Price\ for\ the\ i - th\ Interval \\ M_i - when\ the\ Interval\ Price\ is\ set\ as\ a\ weighted\ average\ based\ on\ MidPrices \\ and\ Market\ MidPrices\ for\ the\ i - th\ Interval \end{cases}$$

W_i – Interval Price Weight shall be set according to the following algorithm:

$$W_i = \begin{cases} Wt_i - when\ there\ is\ the\ Transaction\ Price\ for\ the\ i - th\ Interval \\ W_i - when\ the\ Interval\ Price\ is\ set\ as\ a\ weighted\ average\ based\ on\ MidPrices \\ and\ Market\ MidPrices\ for\ the\ i - th\ Interval \end{cases}$$

22. The Reference Price shall be rounded to the third decimal place.