

Methodological sheet

Government bond basket yields

I. Definition and content

Yields on a bond basket compiled on the basis of government bond yields broken down by the average residual maturity of bonds included in the relevant basket serve as indicators of long-term interest rates on the Czech financial market.

II. Sources and methodology of ascertainment

The sources for the calculation are daily data from the Prague Stock Exchange's (PSE) official price list and daily reference prices of bonds on the MTS Czech Republic electronic platform. The calculation is based on the mean of the average reference prices (quotations) for the purchase and sale of bonds.

III. Breakdown

Bond basket yields are published on a monthly basis for the following categories of the average residual maturity of bonds included in the basket:

- 2 years,
- 5 years,
- 10 years.

The time series for the bond baskets with residual maturities of 2 years and 5 years are available from January 2004, and the time series for the bond basket with a residual maturity of 10 years is available from April 2000.

IV. Method of calculation

The bond yield is determined using the formula recommended by the International Securities Market Association for yield to maturity (ISMA 6.3).

$$P = \sum_{i=1}^n CF_i * V^{L_i} ,$$

where:

- | | | |
|-----------------|-----|---|
| P | ... | gross price, i.e. clean price (mean of quotations) plus accrued interest, |
| n | ... | number of future cash flows, |
| CF _i | ... | i-th cash flow, |
| L _i | ... | time in years to i-th cash flow, |
| V | ... | annualised discounting factor, i.e. 1/(1+y), where y is annualised yield. |

The yield on the bond basket with the relevant average residual maturity is calculated on the basis of a defined set of benchmark bonds with a suitable range of residual maturities. The following criteria are used to classify the benchmark bonds:

- bond issued by Ministry of Finance,
- bond denominated in Czech koruna,

- not government saving bond issue,
- bond yield determined by fixed interest rate,
- government bond traded in sufficient amounts as of basket determination date,
- bond quotations take place on PSE or MTS Czech Republic.

Manner of inclusion of bonds in the basket

A basic set containing government bonds classified as benchmark bonds is specified for the bond basket with the relevant residual maturity each working day. The residual maturities range between:

- 1 and 3 years for the possibility of including a bond in the bond basket with an average residual maturity of 2 years,
- 3.5 and 6.5 years for the possibility of including a bond in the bond basket with an average residual maturity of 5 years,
- 8 and 12 years for the possibility of including a bond in the bond basket with an average residual maturity of 10 years.

From this set, a combination of bonds is then generated whose average residual maturity is closest to 2, 5 or 10 years. For this combination of bonds, referred to as the bond basket, the average yield is calculated as a simple arithmetic average of the yields on all bonds included in the bond basket.

End of month values are the bond basket yields as of the last business day of the month provided that there was a quotation of at least one bond included in the given basket for that day. *Monthly averages* are the simple arithmetic means of the values for all business days in the month.

The monthly average yield on the bond basket with an average residual maturity of 10 years at the same time represents the indicator of the long-term interest rate (LTIR) for convergence purposes. The LTIR time series, including the specific methodology, is available in a separate ARAD system dataset (*ARAD time series database >> Financial market statistics >> Capital market >> Government bond yields >> Long-term interest rates for convergence purposes (%) >> 10Y government bond yield (Maastricht criterion)*).

V. Change in methodology**List of benchmark government bonds**

ISIN	Bond title	Date of issue	Maturity date
CZ0001000707	Bond of the Czech Republic, 2000 - 2005, 6.75%	18 Feb. 2000	18 Feb. 2005
CZ0001000715	Bond of the Czech Republic, 2000 - 2004, 7.95%	5 Feb. 2000	5 Feb. 2004
CZ0001000723	Bond of the Czech Republic, 2000 - 2007, 6.30%	17 Mar. 2000	17 Mar. 2007
CZ0001000731	Bond of the Czech Republic, 2000 - 2010, 6.40%	14 Apr. 2000	14 Apr. 2010
CZ0001000749	Bond of the Czech Republic, 2001 - 2016, 6.95%	26 Jan. 2001	26 Jan. 2016
CZ0001000756	Bond of the Czech Republic, 2001 - 2004, 6.05%	14 Sep. 2001	14 Sep. 2004
CZ0001000764	Bond of the Czech Republic, 2001 - 2011, 6.55%	5 Oct. 2001	5 Oct. 2011
CZ0001000772	Bond of the Czech Republic, 2001 - 2006, 5.70%	26 Oct. 2001	26 Oct. 2006
CZ0001000780	Bond of the Czech Republic, 2003 - 2006, 3.00%	20 Jan. 2003	20 Jan. 2006
CZ0001000798	Bond of the Czech Republic, 2003 - 2008, 2.90%	17 Mar. 2003	17 Mar. 2008
CZ0001000814	Bond of the Czech Republic, 2003 - 2013, 3.70%	16 Jun. 2003	16 Jun. 2013
CZ0001000822	Bond of the Czech Republic, 2003 - 2018, 4.60%	18 Aug. 2003	18 Aug. 2018
CZ0001000855	Bond of the Czech Republic, 2004 - 2009, 3.80%	22 Mar. 2004	22 Mar. 2009
CZ0001000863	Bond of the Czech Republic, 2003 - 2007, 3.95%	2 Aug. 2004	2 Aug. 2007
CZ0001001143	Bond of the Czech Republic, 2005 - 2015, 3.80%	11 Apr. 2005	11 Apr. 2015
CZ0001001242	Bond of the Czech Republic, 2005 - 2010, 2.55%	18 Jul. 2005	18 Oct. 2010
CZ0001001309	Bond of the Czech Republic, 2005 - 2008, 2.30%	26 Sep. 2005	26 Sep. 2008
CZ0001001317	Bond of the Czech Republic, 2005 - 2020, 3.75%	12 Sep. 2005	12 Sep. 2020
CZ0001001754	Bond of the Czech Republic, 2006 - 2009, 3.25%	27 Nov. 2006	27 Nov. 2009
CZ0001001796	Bond of the Czech Republic, 2006 - 2036, 4.20%	4 Dec. 2006	4 Dec. 2036
CZ0001001887	Bond of the Czech Republic, 2007 - 2012, 3.55%	16 Apr. 2007	18 Oct. 2012
CZ0001001903	Bond of the Czech Republic, 2007 - 2017, 4.00%	30 Apr. 2007	11 Apr. 2017
CZ0001001945	Bond of the Czech Republic, 2007 - 2022, 4.70%	18 Jun. 2007	12 Sep. 2022
CZ0001002059	Bond of the Czech Republic, 2007 - 2057, 4.85%	26 Nov. 2007	26 Nov. 2057
CZ0001002158	Bond of the Czech Republic, 2008 - 2011, 4.10%	28 Jan. 2008	11 Apr. 2011
CZ0001002471	Bond of the Czech Republic, 2009 - 2019, 5.00%	23 Mar. 2009	11 Apr. 2019
CZ0001002547	Bond of the Czech Republic, 2009 - 2024, 5.70%	25 May 2009	25 May 2024
CZ0001002729	Bond of the Czech Republic, 2010 - 2013, 2.80%	1 Feb. 2010	16 Sep. 2013
CZ0001002737	Bond of the Czech Republic, 2010 - 2015, 3.40%	1 Mar. 2010	1 Sep. 2015
CZ0001002851	Bond of the Czech Republic, 2010 - 2021, 3.85%	29 Nov. 2010	29 Sep. 2021
CZ0001002869	Bond of the Czech Republic, 2011 - 2014, 2.75%	28 Feb. 2011	31 Mar. 2014
CZ0001003834	Czech Republic Government Bond, 2013 - 2019, 1.50%	14 Jan. 2013	29 Oct. 2019
CZ0001003842	Czech Republic Government Bond, 2013 - 2016, 0.50%	28 Jan. 2013	28 Jul. 2016
CZ0001003859	Czech Republic Government Bond, 2013 - 2028, 2.50%	25 Feb. 2013	25 Aug. 2028
CZ0001004246	Czech Republic Government Bond, 2014 - 2018, 0.85 %	17 Mar. 2014	17 Mar. 2018
CZ0001004253	Czech Republic Government Bond, 2014 - 2025, 2.40 %	17 Mar. 2014	17 Sep. 2025
CZ0001004469	Czech Republic Government Bond, 2015 - 2026, 1.00 %	26 Jun. 2015	26 Jun. 2026
CZ0001004592	Czech Republic Government Bond, 2015 - 2017, 0.00 %	11 Sep. 2015	9 Nov. 2017
CZ0001004600	Czech Republic Government Bond, 2015 - 2023, 0.45 %	25 Sep. 2015	25 Oct. 2023
CZ0001004717	Czech Republic Government Bond, 2016 - 2019, 0.00 %	15 Jan. 2016	17 Jul. 2019
CZ0001004709	Czech Republic Government Bond, 2016 - 2018, 0.00 %	22 Jan. 2016	22 Jan. 2018
CZ0001005037	Czech Republic Government Bond, 2017 - 2027, 0.25 %	10 Feb. 2017	10 Feb. 2027
CZ0001005011	Czech Republic Government Bond, 2017 - 2020, 0.00 %	10 Feb. 2017	10 Feb. 2020
CZ0001005029	Czech Republic Government Bond, 2017 - 2022, 0.00 %	24 Feb. 2017	24 Feb. 2022
CZ0001005243	Czech Republic Government Bond, 2017 - 2033, 2.00 %	13 Oct. 2017	13 Oct. 2033
CZ0001005367	Czech Republic Government Bond, 2018 - 2021, 0.75 %	23 Feb. 2018	23 Feb. 2021
CZ0001005375	Czech Republic Government Bond, 2018 - 2029, 2.75 %	23 Feb. 2018	23 Jul. 2029