

II. Term structure of interest rates in the debt securities market *

a) Term structure of interest rates in the debt securities market - estimated values, listed Federal securities

% per annum

Interest rate at a residual maturity of ... years										
End of year or month or trading day	1	2	3	4	5	6	7	8	9	10
2013	0.13	0.24	0.44	0.69	0.95	1.21	1.47	1.70	1.92	2.11
2014	0.10	0.10	0.10	0.06	0.02	0.12	0.24	0.36	0.49	0.60
2015	0.39	0.35	0.26	0.14	0.01	0.13	0.28	0.42	0.56	0.70
2016	0.84	0.80	0.76	0.65	0.51	0.35	0.18	0.03	0.10	0.22
2017	0.72	0.64	0.50	0.34	0.18	0.02	0.12	0.25	0.37	0.48
2018	0.70	0.65	0.56	0.44	0.31	0.18	0.06	0.06	0.16	0.25
2019	0.69	0.63	0.58	0.54	0.49	0.44	0.37	0.31	0.25	0.19
2020	0.73	0.75	0.77	0.77	0.75	0.72	0.68	0.65	0.61	0.57
2021	0.73	0.68	0.62	0.56	0.50	0.44	0.38	0.33	0.28	0.24
2022	2.39	2.59	2.55	2.50	2.47	2.47	2.48	2.50	2.51	2.53
2023	2.97	2.35	2.04	1.91	1.87	1.88	1.92	1.96	2.01	2.06
2022 Nov.	2.00	2.08	2.01	1.95	1.92	1.92	1.92	1.92	1.93	1.94
2022 Dec.	2.39	2.59	2.55	2.50	2.47	2.47	2.48	2.50	2.51	2.53
2023 Jan.	2.65	2.59	2.43	2.31	2.25	2.23	2.23	2.25	2.27	2.28
2023 Feb.	3.17	3.11	2.92	2.78	2.69	2.65	2.63	2.63	2.64	2.65
2023 Mar.	2.82	2.65	2.53	2.44	2.39	2.36	2.34	2.34	2.34	2.35
2023 Apr.	2.90	2.69	2.49	2.37	2.32	2.31	2.31	2.32	2.34	2.35
2023 May	2.97	2.71	2.53	2.41	2.33	2.28	2.26	2.25	2.26	2.28
2023 June	3.43	3.14	2.86	2.66	2.55	2.48	2.45	2.43	2.43	2.43
2023 July	3.39	3.07	2.80	2.62	2.53	2.48	2.47	2.48	2.50	2.52
2023 Aug.	3.34	2.98	2.70	2.54	2.47	2.44	2.44	2.46	2.48	2.51
2023 Sep.	3.58	3.19	2.92	2.80	2.76	2.76	2.78	2.80	2.84	2.87
2023 Oct.	3.47	3.00	2.74	2.63	2.61	2.63	2.66	2.71	2.76	2.80
2023 Nov.	3.26	2.77	2.48	2.32	2.26	2.26	2.29	2.34	2.40	2.45
2023 Dec.	2.97	2.35	2.04	1.91	1.87	1.88	1.92	1.96	2.01	2.06
2024 Jan.	3.12	2.53	2.24	2.11	2.07	2.08	2.11	2.15	2.19	2.24
2024 Feb.	3.40	2.97	2.70	2.55	2.47	2.44	2.44	2.45	2.48	2.51
2024 Mar.	3.29	2.82	2.54	2.37	2.29	2.26	2.26	2.27	2.30	2.33
2024 Apr.	3.34	2.97	2.73	2.59	2.52	2.49	2.48	2.50	2.53	2.56
2024 Apr. 3	3.26	2.80	2.53	2.38	2.32	2.30	2.31	2.34	2.37	2.41
2024 Apr. 4	3.27	2.80	2.53	2.38	2.31	2.29	2.30	2.32	2.35	2.39
2024 Apr. 5	3.27	2.80	2.52	2.37	2.30	2.27	2.28	2.31	2.34	2.38
2024 Apr. 8	3.31	2.87	2.60	2.45	2.38	2.36	2.37	2.39	2.43	2.47
2024 Apr. 9	3.31	2.87	2.60	2.44	2.37	2.34	2.34	2.36	2.38	2.42
2024 Apr. 10	3.28	2.82	2.54	2.39	2.31	2.28	2.28	2.30	2.33	2.37
2024 Apr. 11	3.35	2.93	2.67	2.52	2.43	2.40	2.40	2.42	2.45	2.48
2024 Apr. 12	3.29	2.85	2.58	2.42	2.35	2.32	2.32	2.34	2.37	2.40
2024 Apr. 15	3.27	2.82	2.56	2.41	2.34	2.32	2.32	2.34	2.38	2.41
2024 Apr. 16	3.29	2.85	2.59	2.46	2.39	2.37	2.38	2.40	2.44	2.47
2024 Apr. 17	3.31	2.89	2.64	2.49	2.42	2.40	2.41	2.43	2.47	2.50
2024 Apr. 18	3.30	2.88	2.62	2.47	2.40	2.37	2.38	2.40	2.43	2.46
2024 Apr. 19	3.30	2.90	2.65	2.51	2.43	2.40	2.40	2.42	2.45	2.48
2024 Apr. 22	3.33	2.95	2.71	2.57	2.49	2.47	2.47	2.49	2.51	2.55
2024 Apr. 23	3.32	2.92	2.67	2.53	2.45	2.42	2.42	2.44	2.47	2.50
2024 Apr. 24	3.32	2.94	2.70	2.56	2.49	2.46	2.47	2.49	2.52	2.56
2024 Apr. 25	3.32	2.95	2.71	2.58	2.51	2.49	2.50	2.52	2.55	2.59
2024 Apr. 26	3.35	3.00	2.77	2.63	2.56	2.53	2.54	2.55	2.58	2.62
2024 Apr. 29	3.32	2.94	2.70	2.56	2.48	2.45	2.46	2.48	2.51	2.54
2024 Apr. 30	3.34	2.97	2.73	2.59	2.52	2.49	2.48	2.50	2.53	2.56
2024 May 2	3.35	2.98	2.75	2.60	2.52	2.49	2.49	2.50	2.53	2.56
2024 May 3	3.34	2.97	2.73	2.59	2.51	2.48	2.48	2.49	2.52	2.55
Memo item: yields, derived from the term structure of interest rates, on listed Federal securities with annual coupon payments										
2024 Apr. 30	3.34	2.98	2.74	2.60	2.53	2.50	2.49	2.51	2.53	2.56
Parameters for calculating the term structure of interest rates										
Beta0 Beta1 Beta2 Beta3 Tau1 Tau2										
2024 Apr. 29	2.03668	1.86554	- 27.78830	26.53298	4.49860	5.11399				
2024 Apr. 30	1.86340	2.02465	- 21.90996	21.16825	4.66512	5.55576				
2024 May 2	1.85420	2.03741	- 22.99576	22.25961	4.70689	5.54901				
2024 May 3	1.91370	1.97448	- 28.16468	27.22348	4.65380	5.29223				

* Interest rates on (theoretical) zero coupon bonds without a default risk, estimated according to the procedure outlined in the explanatory notes. The estimates are based on the prices of Federal bonds, five-year Federal notes and Federal Treasury notes with

a residual maturity of at least three months. The interest rates are estimated using a non-linear, parametric approach.

II. Term structure of interest rates in the debt securities market *

still: a) Term structure of interest rates in the debt securities market - estimated values, listed Federal securities

% per annum

		Interest rate at a residual maturity of ... years									
End of year or month or trading day		11	12	13	14	15	16	17	18	19	20
2013		2.28	2.42	2.55	2.66	2.75	2.82	2.87	2.92	2.95	2.97
2014		0.71	0.81	0.90	0.98	1.05	1.12	1.18	1.23	1.27	1.32
2015		0.82	0.94	1.04	1.14	1.22	1.30	1.36	1.41	1.46	1.50
2016		0.33	0.42	0.49	0.56	0.62	0.67	0.72	0.76	0.80	0.83
2017		0.57	0.66	0.74	0.81	0.87	0.92	0.97	1.02	1.06	1.10
2018		0.33	0.40	0.47	0.52	0.57	0.62	0.66	0.69	0.73	0.76
2019		-	0.14	-	0.04	-	0.00	0.04	0.11	0.13	0.19
2020		-	0.53	-	0.46	-	0.40	-	0.35	-	0.30
2021		-	0.20	-	0.13	-	0.07	-	0.03	-	0.01
2022		2.55	2.56	2.57	2.57	2.58	2.58	2.57	2.57	2.56	2.55
2023		2.11	2.15	2.19	2.22	2.25	2.27	2.28	2.30	2.30	2.31
2022 Nov.		1.94	1.95	1.95	1.95	1.94	1.94	1.93	1.92	1.91	1.90
2022 Dec.		2.55	2.56	2.57	2.57	2.58	2.58	2.57	2.57	2.56	2.55
2023 Jan.		2.30	2.32	2.33	2.34	2.34	2.35	2.34	2.34	2.33	2.32
2023 Feb.		2.66	2.67	2.67	2.68	2.68	2.68	2.68	2.67	2.67	2.66
2023 Mar.		2.36	2.38	2.39	2.40	2.42	2.42	2.43	2.44	2.44	2.44
2023 Apr.		2.37	2.38	2.39	2.40	2.41	2.41	2.42	2.43	2.43	2.44
2023 May		2.30	2.32	2.35	2.37	2.40	2.42	2.43	2.45	2.46	2.46
2023 June		2.43	2.43	2.43	2.43	2.44	2.44	2.44	2.44	2.44	2.44
2023 July		2.54	2.56	2.58	2.59	2.61	2.62	2.63	2.63	2.63	2.63
2023 Aug.		2.53	2.56	2.58	2.60	2.62	2.63	2.64	2.65	2.65	2.65
2023 Sep.		2.90	2.92	2.95	2.97	2.99	3.00	3.02	3.02	3.03	3.03
2023 Oct.		2.84	2.88	2.92	2.95	2.98	3.00	3.02	3.04	3.05	3.06
2023 Nov.		2.51	2.56	2.60	2.64	2.66	2.69	2.70	2.71	2.71	2.72
2023 Dec.		2.11	2.15	2.19	2.22	2.25	2.27	2.28	2.30	2.30	2.31
2024 Jan.		2.28	2.32	2.35	2.38	2.41	2.43	2.44	2.46	2.47	2.47
2024 Feb.		2.54	2.57	2.60	2.62	2.64	2.65	2.66	2.67	2.68	2.68
2024 Mar.		2.36	2.39	2.42	2.44	2.46	2.48	2.49	2.50	2.50	2.50
2024 Apr.		2.59	2.63	2.65	2.68	2.70	2.71	2.72	2.73	2.73	2.73
2024 Apr.	3	2.44	2.48	2.51	2.54	2.56	2.58	2.59	2.60	2.61	2.61
2024 Apr.	4	2.42	2.46	2.49	2.51	2.53	2.55	2.57	2.58	2.58	2.59
2024 Apr.	5	2.41	2.44	2.48	2.50	2.52	2.54	2.56	2.57	2.57	2.57
2024 Apr.	8	2.50	2.54	2.57	2.59	2.61	2.63	2.64	2.65	2.65	2.65
2024 Apr.	9	2.45	2.48	2.51	2.53	2.55	2.56	2.57	2.58	2.58	2.58
2024 Apr.	10	2.40	2.43	2.46	2.49	2.51	2.53	2.54	2.55	2.55	2.55
2024 Apr.	11	2.51	2.54	2.57	2.59	2.61	2.62	2.63	2.63	2.63	2.63
2024 Apr.	12	2.44	2.47	2.50	2.52	2.54	2.55	2.56	2.57	2.57	2.57
2024 Apr.	15	2.44	2.48	2.51	2.53	2.55	2.57	2.58	2.59	2.60	2.60
2024 Apr.	16	2.51	2.54	2.57	2.59	2.61	2.63	2.64	2.65	2.65	2.66
2024 Apr.	17	2.53	2.56	2.59	2.61	2.63	2.65	2.66	2.66	2.67	2.67
2024 Apr.	18	2.50	2.53	2.55	2.58	2.60	2.61	2.62	2.63	2.63	2.63
2024 Apr.	19	2.51	2.54	2.57	2.59	2.61	2.62	2.63	2.64	2.64	2.64
2024 Apr.	22	2.58	2.61	2.63	2.66	2.68	2.69	2.70	2.70	2.71	2.70
2024 Apr.	23	2.53	2.57	2.59	2.62	2.64	2.65	2.66	2.67	2.67	2.67
2024 Apr.	24	2.59	2.63	2.65	2.68	2.70	2.72	2.73	2.73	2.74	2.74
2024 Apr.	25	2.62	2.66	2.69	2.71	2.73	2.75	2.76	2.77	2.77	2.77
2024 Apr.	26	2.65	2.68	2.71	2.73	2.75	2.77	2.78	2.79	2.79	2.79
2024 Apr.	29	2.58	2.61	2.64	2.66	2.68	2.70	2.71	2.71	2.72	2.72
2024 Apr.	30	2.59	2.63	2.65	2.68	2.70	2.71	2.72	2.73	2.73	2.73
2024 May	2	2.59	2.62	2.65	2.67	2.69	2.71	2.72	2.72	2.72	2.72
2024 May	3	2.58	2.61	2.63	2.66	2.67	2.69	2.70	2.70	2.70	2.70
Memo item: yields, derived from the term structure of interest rates, on listed Federal securities with annual coupon payments											
2024 Apr.	30	2.59	2.62	2.64	2.66	2.68	2.69	2.70	2.71	2.71	2.71
Parameters for calculating the term structure of interest rates											
		Beta0	Beta1	Beta2	Beta3	Tau1	Tau2				
2024 Apr.	29	2.03668	1.86554	- 27.78830	26.53298	4.49860	5.11399				
2024 Apr.	30	1.86340	2.02465	- 21.90996	21.16825	4.66512	5.55576				
2024 May	2	1.85420	2.03741	- 22.99576	22.25961	4.70689	5.54901				
2024 May	3	1.91370	1.97448	- 28.16468	27.22348	4.65380	5.29223				

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still: a) Term structure of interest rates in the debt securities market - estimated values, listed Federal securities

% per annum

		Interest rate at a residual maturity of ... years											
End of year or month or trading day		21	22	23	24	25	26	27	28	29	30		
2013		2.99	2.99	2.99	2.98	2.97	2.96	2.94	2.92	2.89	2.86		
2014		1.36	1.39	1.43	1.46	1.48	1.51	1.53	1.55	1.57	1.59		
2015		1.53	1.56	1.57	1.59	1.59	1.60	1.60	1.59	1.59	1.58		
2016		0.86	0.89	0.91	0.94	0.96	0.98	1.00	1.01	1.03	1.04		
2017		1.13	1.16	1.19	1.22	1.24	1.26	1.28	1.30	1.32	1.34		
2018		0.78	0.81	0.83	0.85	0.87	0.89	0.90	0.92	0.93	0.95		
2019		0.21	0.23	0.25	0.26	0.28	0.29	0.31	0.32	0.33	0.34		
2020		-	0.26	-	0.23	-	0.21	-	0.17	-	0.15	-	0.14
2021		0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.12		
2022		2.53	2.52	2.50	2.48	2.47	2.45	2.43	2.41	2.39	2.36		
2023		2.31	2.31	2.30	2.30	2.29	2.28	2.27	2.25	2.24	2.22		
2022 Nov.		1.89	1.87	1.86	1.84	1.83	1.81	1.80	1.78	1.77	1.75		
2022 Dec.		2.53	2.52	2.50	2.48	2.47	2.45	2.43	2.41	2.39	2.36		
2023 Jan.		2.31	2.30	2.28	2.26	2.24	2.22	2.20	2.18	2.16	2.13		
2023 Feb.		2.65	2.63	2.62	2.60	2.58	2.57	2.55	2.53	2.51	2.48		
2023 Mar.		2.43	2.42	2.41	2.40	2.39	2.37	2.36	2.34	2.32	2.29		
2023 Apr.		2.44	2.44	2.45	2.45	2.45	2.46	2.46	2.46	2.46	2.46		
2023 May		2.47	2.47	2.46	2.46	2.44	2.43	2.42	2.40	2.38	2.36		
2023 June		2.44	2.44	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45		
2023 July		2.63	2.62	2.62	2.61	2.60	2.58	2.57	2.56	2.54	2.52		
2023 Aug.		2.65	2.65	2.64	2.63	2.62	2.61	2.60	2.59	2.57	2.56		
2023 Sep.		3.03	3.03	3.03	3.02	3.02	3.01	3.00	2.99	2.98	2.96		
2023 Oct.		3.07	3.07	3.07	3.07	3.06	3.06	3.05	3.04	3.03	3.02		
2023 Nov.		2.71	2.71	2.70	2.69	2.68	2.67	2.66	2.65	2.63	2.62		
2023 Dec.		2.31	2.31	2.30	2.30	2.29	2.28	2.27	2.25	2.24	2.22		
2024 Jan.		2.48	2.48	2.47	2.47	2.46	2.45	2.44	2.43	2.41	2.40		
2024 Feb.		2.67	2.67	2.66	2.65	2.64	2.63	2.62	2.60	2.59	2.57		
2024 Mar.		2.50	2.50	2.49	2.49	2.48	2.47	2.45	2.44	2.43	2.41		
2024 Apr.		2.73	2.72	2.71	2.70	2.69	2.68	2.66	2.65	2.63	2.62		
2024 Apr.	3	2.61	2.61	2.60	2.60	2.59	2.58	2.56	2.55	2.53	2.52		
2024 Apr.	4	2.59	2.59	2.58	2.57	2.57	2.55	2.54	2.53	2.51	2.50		
2024 Apr.	5	2.57	2.57	2.56	2.56	2.55	2.54	2.52	2.51	2.49	2.48		
2024 Apr.	8	2.65	2.65	2.64	2.63	2.62	2.61	2.60	2.59	2.58	2.56		
2024 Apr.	9	2.58	2.58	2.57	2.56	2.55	2.54	2.53	2.52	2.51	2.49		
2024 Apr.	10	2.55	2.55	2.54	2.53	2.52	2.51	2.50	2.48	2.46	2.45		
2024 Apr.	11	2.63	2.62	2.61	2.60	2.59	2.58	2.56	2.55	2.54	2.52		
2024 Apr.	12	2.57	2.56	2.56	2.55	2.53	2.52	2.51	2.49	2.48	2.46		
2024 Apr.	15	2.60	2.60	2.59	2.58	2.57	2.56	2.54	2.53	2.51	2.49		
2024 Apr.	16	2.65	2.65	2.64	2.63	2.62	2.61	2.60	2.58	2.57	2.55		
2024 Apr.	17	2.66	2.66	2.65	2.64	2.63	2.62	2.61	2.59	2.58	2.56		
2024 Apr.	18	2.63	2.62	2.61	2.61	2.60	2.58	2.57	2.56	2.54	2.53		
2024 Apr.	19	2.64	2.63	2.63	2.62	2.61	2.60	2.58	2.57	2.56	2.54		
2024 Apr.	22	2.70	2.69	2.69	2.68	2.67	2.65	2.64	2.63	2.61	2.60		
2024 Apr.	23	2.67	2.66	2.65	2.65	2.63	2.62	2.61	2.60	2.58	2.57		
2024 Apr.	24	2.73	2.73	2.72	2.71	2.70	2.69	2.68	2.66	2.65	2.64		
2024 Apr.	25	2.77	2.77	2.76	2.75	2.74	2.73	2.72	2.71	2.69	2.68		
2024 Apr.	26	2.79	2.78	2.77	2.76	2.75	2.74	2.73	2.71	2.70	2.68		
2024 Apr.	29	2.72	2.71	2.70	2.69	2.68	2.67	2.66	2.65	2.64	2.63		
2024 Apr.	30	2.73	2.72	2.71	2.70	2.69	2.68	2.66	2.65	2.63	2.62		
2024 May	2	2.72	2.71	2.70	2.69	2.68	2.67	2.66	2.64	2.63	2.61		
2024 May	3	2.70	2.69	2.68	2.67	2.66	2.65	2.64	2.62	2.61	2.59		
Memo item: yields, derived from the term structure of interest rates, on listed Federal securities with annual coupon payments													
2024 Apr.	30	2.71	2.71	2.70	2.69	2.68	2.68	2.67	2.66	2.65	2.63		
Parameters for calculating the term structure of interest rates													
		Beta0		Beta1		Beta2		Beta3		Tau1		Tau2	
2024 Apr.	29	2.03668		1.86554		- 27.78830		26.53298		4.49860		5.11399	
2024 Apr.	30	1.86340		2.02465		- 21.90996		21.16825		4.66512		5.55576	
2024 May	2	1.85420		2.03741		- 22.99576		22.25961		4.70689		5.54901	
2024 May	3	1.91370		1.97448		- 28.16468		27.22348		4.65380		5.29223	

* Interest rates on (theoretical) zero coupon bonds without a default risk, estimated according to the procedure outlined in the explanatory notes. The estimates are based on the prices of Federal bonds, five-year Federal notes and Federal Treasury notes with

a residual maturity of at least three months. The interest rates are estimated using a non-linear, parametric approach.