

HLB Option Sensitivity Analysis for HLB-Option, Flipper, and Knockout Advances

The Federal Home Loan Bank of Boston (Bank) is providing estimated valuations of the specific aforementioned advances for members' information and convenience only. The estimated valuations are generated by models obtained from external sources which are used for the Bank's own asset/liability management purposes. The models include the use of specific assumptions, for example, market volatility and discount curve adjusted for the Bank's spread, to estimate the value of the advance. The valuations represent theoretical market values only and should not be construed as a liquidation price for the aforementioned advances.

It is expressly understood that in providing this valuation information to members, the Bank is not performing any advisory service. The valuations are being provided without representation or warranty and the member shall be solely responsible for any decision it makes or actions it takes based on the valuations provided. It is recommended that institutions maintain independent capabilities to value their asset/liability positions, including the aforementioned advances.

The table depicts valuation estimates resulting from immediate, parallel interest-rate movements. In order to rule out negative interest rates, our model applies an effective floor of plus ten basis points to the yield curve for all down-rate scenarios. As a result, large down-rate shocks will reflect valuation at the floor rate of ten basis points in place of any negative interest rates that would otherwise be produced. Please note that the valuation estimates are from the Bank's perspective. Since the member holds the advance as a liability, positive price changes in the table correspond to the advance having a negative impact on the member's estimated market value of portfolio equity (and vice versa). The theoretical argument follows that as interest rates rise, the value of the advance to the Bank falls. In the case of an HLB-Option or a Flipper advance, the Bank would likely exercise its option to cancel the advance as the value falls below 100. In the case of a Knockout advance, the Bank is obligated to terminate the advance on any specified cancellation date if LIBOR is equal to or greater than the predetermined "strike rate." In either case, the member's cost to prepay the advance increases as interest rates fall.

To identify your advance, locate the appropriate start date and maturity date and then verify the coupon rate. The report is sorted in ascending order by start date, followed by coupon. Once the appropriate structure is determined, read across to view the sensitivity analysis that has been performed on the advance.

If you have any questions or would like further explanation of this analysis, contact Member Financial Strategies at 1-800-292-9644.

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
4/9/2007	4/10/2017	4/10/2017	4.15000	100.11527	100.11527	100.11527	100.09144	100.06360	100.03580	100.00803	99.98028
4/12/2007	4/12/2017	4/12/2017	4.25000	100.14166	100.14166	100.14166	100.11306	100.07966	100.04629	100.01297	99.97968
4/13/2007	4/13/2017	4/13/2017	4.45000	100.16069	100.16069	100.16069	100.12970	100.09351	100.05736	100.02126	99.98519
5/18/2007	5/18/2017	5/18/2017	4.19000	100.55863	100.55863	100.55863	100.44443	100.31256	100.18106	100.04992	99.91914
5/29/2007	5/30/2017	5/30/2017	4.25000	100.70829	100.70829	100.70829	100.56560	100.40147	100.23788	100.07483	99.91231
6/7/2007	6/7/2017	6/7/2017	4.82000	100.91040	100.91040	100.91040	100.74648	100.56008	100.37438	100.18938	100.00507
6/8/2007	6/8/2017	6/8/2017	4.49000	100.86054	100.86054	100.86054	100.69402	100.50493	100.31656	100.12890	99.94197
6/18/2007	6/19/2017	6/19/2017	4.50000	100.99994	100.99994	100.99994	100.80401	100.58437	100.36570	100.14799	99.93125
6/19/2007	6/19/2017	6/19/2017	4.65000	101.03328	101.03328	101.03328	100.83730	100.61760	100.39888	100.18113	99.96433
6/22/2007	6/22/2017	6/22/2017	4.50000	101.03744	101.03744	101.03744	100.83349	100.60552	100.37859	100.15271	99.92785
6/28/2007	6/28/2017	6/28/2017	4.50000	101.11244	101.11244	101.11244	100.89244	100.64783	100.40440	100.16216	99.92109
7/13/2007	7/13/2017	4/13/2017	4.29000	101.23926	101.23926	101.23926	100.97011	100.68520	100.40192	100.12025	99.97944
7/20/2007	7/20/2017	4/20/2017	4.29000	101.32267	101.32267	101.32267	101.02989	100.72624	100.42444	100.12445	99.96850
7/27/2007	7/27/2017	4/27/2017	4.25000	101.39297	101.39297	101.39297	101.07660	100.75424	100.43395	100.11683	99.95465
7/30/2007	1/30/2019	5/1/2017	3.99000	107.42536	107.42536	106.34348	104.50086	102.78576	101.34699	100.36878	99.96099
7/31/2007	7/31/2017	5/1/2017	3.99000	101.35208	101.35208	101.35208	101.02238	100.68951	100.35884	100.06686	99.92712
7/31/2007	7/31/2017	5/1/2017	3.99000	101.35208	101.35208	101.35208	101.02238	100.68951	100.35884	100.06686	99.92712
7/31/2007	7/31/2017	5/1/2017	4.06000	101.37580	101.37580	101.37580	101.04605	100.71314	100.38242	100.08355	99.93355
8/2/2007	8/2/2017	5/2/2017	4.05000	101.39491	101.39491	101.39301	101.05751	100.71927	100.38329	100.08178	99.93080
8/9/2007	8/9/2017	5/9/2017	3.99000	101.45183	101.45183	101.44324	101.08768	100.73080	100.37645	100.06971	99.91150
8/16/2007	8/16/2017	5/16/2017	3.99000	101.52941	101.52941	101.51415	101.13848	100.76294	100.39074	100.07236	99.89794
8/17/2007	8/17/2017	5/17/2017	4.00000	101.54435	101.54435	101.52814	101.14959	100.77138	100.39657	100.07536	99.89736
9/4/2007	9/5/2017	6/5/2017	3.89000	101.70717	101.70717	101.67176	101.23916	100.81005	100.39186	100.05881	99.83966
9/10/2007	9/11/2017	6/12/2017	3.69000	101.68089	101.68089	101.63846	101.18933	100.74398	100.31873	99.99883	99.77750
9/11/2007	9/11/2017	6/12/2017	3.59000	101.63533	101.63533	101.59290	101.14389	100.69876	100.27891	99.97244	99.75675
9/13/2007	9/13/2017	6/13/2017	3.99000	101.83972	101.83972	101.79493	101.33987	100.88867	100.44774	100.08547	99.83859
9/27/2007	9/27/2017	6/27/2017	3.65000	101.82488	101.82488	101.76371	101.27001	100.78110	100.32006	99.97348	99.71704
10/11/2007	10/11/2017	4/11/2017	3.99000	102.15003	102.15003	102.07203	101.53970	101.01279	100.50620	100.09853	99.97345
10/15/2007	10/16/2017	4/17/2017	3.99000	102.20545	102.20545	102.12139	101.57553	101.03538	100.51616	100.10091	99.95909
10/26/2007	10/26/2017	4/26/2017	3.39000	101.96794	101.96794	101.87188	101.30007	100.73757	100.23368	99.96640	99.89446
11/5/2007	11/6/2017	5/5/2017	4.39000	102.68263	102.68263	102.57362	101.96957	101.37258	100.79187	100.28237	99.98512
11/6/2007	11/6/2017	5/8/2017	3.48000	102.12651	102.12651	102.01768	101.41549	100.82424	100.29231	99.98458	99.85881
11/19/2007	11/20/2017	11/19/2012	4.29000	102.78834	102.78834	102.66361	102.02054	101.38531	100.75801	100.13849	99.52662
11/20/2007	11/20/2017	5/22/2017	3.74000	102.43084	102.43084	102.30625	101.66443	101.03240	100.44421	100.04015	99.85032
11/23/2007	11/24/2017	11/23/2011	3.99000	102.63767	102.63767	102.50853	101.85495	101.20951	100.57227	99.94306	99.32174
11/23/2007	11/24/2017	11/23/2011	3.99000	102.63767	102.63767	102.50853	101.85495	101.20951	100.57227	99.94306	99.32174
11/29/2007	11/29/2017	5/30/2017	2.95000	101.99108	101.99108	101.85661	101.19182	100.55392	100.08172	99.86059	99.69695
11/30/2007	11/30/2017	5/30/2017	3.19000	102.16194	102.16194	102.02629	101.35801	100.70826	100.17580	99.90419	99.73675
12/10/2007	12/11/2017	6/12/2017	3.45000	102.44357	102.44357	102.29376	101.59514	100.91272	100.32053	99.95277	99.72892
12/24/2007	12/26/2017	12/24/2012	3.99000	102.99231	102.99231	102.82307	102.08235	101.35211	100.63232	99.92278	99.22326
1/7/2008	1/8/2018	4/7/2017	2.59000	102.03583	102.03583	101.84945	101.08107	100.39511	100.01206	99.97538	99.95598
1/8/2008	1/8/2018	4/10/2017	2.57000	102.02011	102.02011	101.83374	101.06560	100.38212	100.00506	99.96432	99.93662
1/8/2008	1/8/2018	4/10/2017	2.64000	102.07514	102.07514	101.88873	101.11976	100.42584	100.02114	99.96625	99.93856
1/11/2008	1/11/2018	4/11/2017	2.72000	102.16069	102.16069	101.96999	101.19220	100.48085	100.04047	99.96529	99.93481
1/14/2008	1/16/2018	4/14/2017	3.24000	102.61880	102.61880	102.42074	101.62614	100.86116	100.23687	99.97603	99.93724
1/16/2008	1/16/2018	4/17/2017	2.38000	101.92363	101.92363	101.72603	100.94014	100.27216	99.97753	99.93042	99.88337
1/17/2008	1/17/2018	4/17/2017	2.25000	101.82480	101.82480	101.62586	100.84080	100.19985	99.97140	99.92429	99.87724
1/18/2008	1/18/2018	4/18/2017	2.29000	101.86360	101.86360	101.66323	100.87433	100.22166	99.97171	99.92184	99.87203
2/14/2008	2/14/2018	2/14/2012	3.19000	102.83533	102.83533	102.59736	101.72072	100.85890	100.01168	99.17870	98.35961
3/7/2008	3/7/2018	6/7/2017	3.55000	103.36240	103.36240	103.09231	102.15427	101.25097	100.48218	100.01284	99.77099
3/14/2008	3/14/2018	6/14/2017	2.40000	102.31976	102.31976	102.03764	101.10008	100.32831	99.92572	99.70542	99.50265
3/17/2008	3/19/2018	6/19/2017	3.30000	103.23559	103.23559	102.94313	101.97491	101.05523	100.32147	99.91017	99.66753
4/28/2008	4/30/2018	4/28/2017	2.15000	102.35875	102.35875	101.99128	100.94949	100.17902	99.94527	99.86778	99.79041
4/30/2008	4/30/2018	4/30/2017	3.74000	104.10333	104.10333	103.73297	102.63967	101.56284	100.50236	99.45787	98.42906
5/23/2008	5/23/2018	5/23/2017	3.27000	103.79654	103.79654	103.37640	102.22811	101.15719	100.33600	99.94382	99.77747
6/30/2008	7/2/2018	6/30/2011	3.69000	104.69418	104.69418	104.18376	102.91569	101.66865	100.44234	99.23627	98.04999
7/11/2008	7/11/2018	7/11/2012	3.75000	104.86426	104.86426	104.33168	103.03849	101.76706	100.51708	99.28804	98.07946
7/14/2008	7/16/2018	4/14/2017	2.50000	103.27745	103.27745	102.73719	101.48616	100.48768	100.00522	99.94734	99.90858
7/14/2008	7/16/2018	4/14/2017	3.25000	104.26078	104.26078	103.71738	102.42579	101.24485	100.36282	99.97641	99.93763
7/17/2008	7/17/2018	5/14/2017	3.75000	104.92675	104.92675	104.37950	103.06991	101.78257	100.51715	99.27315	98.05006
8/15/2008	8/15/2018	5/15/2017	3.83000	105.34037	105.34037	104.72038	103.33572	102.02340	100.91080	100.18238	99.88961

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
12/27/2011	12/27/2021	12/29/2014	3.55000	117.07816	116.61230	111.65957	106.87727	102.33107	98.00823	93.89663	89.98489
5/15/2012	5/15/2017	11/17/2014	1.95000	100.24372	100.24372	100.24372	100.13690	100.01342	99.89025	99.76741	99.64488
6/20/2012	6/20/2017	6/22/2015	1.63000	100.36669	100.36669	100.36669	100.16897	99.94757	99.72715	99.50772	99.28927
7/16/2012	7/17/2017	7/16/2014	1.72000	100.51593	100.51593	100.51593	100.23462	99.94048	99.64808	99.35740	99.06844
7/18/2012	7/18/2018	7/20/2015	2.72000	103.58100	103.58100	103.03384	101.73071	100.44985	99.19086	97.95322	96.73646
7/19/2012	7/19/2017	7/21/2014	1.69000	100.51631	100.51631	100.51631	100.22832	99.92889	99.63126	99.33542	99.04135
10/1/2012	10/1/2019	4/1/2015	2.25000	105.71186	105.71186	103.88275	101.39167	98.97301	96.62437	94.34333	92.12757
10/5/2012	10/5/2017	10/6/2014	1.63000	100.85109	100.85109	100.78057	100.26802	99.76060	99.25831	98.76106	98.26880
3/8/2013	3/8/2018	3/9/2015	1.78000	101.69076	101.69076	101.42035	100.48745	99.57155	98.67228	97.78920	96.92187
5/7/2014	5/7/2018	5/7/2015	1.76000	101.96505	101.96505	101.58220	100.48254	99.39975	98.33356	97.28362	96.24960
10/16/2014	10/16/2018	10/17/2016	2.48000	103.88494	103.88494	103.10883	101.56380	100.04934	98.56477	97.10934	95.68229
10/24/2014	10/24/2018	10/26/2015	1.74000	102.76427	102.76427	101.96981	100.41279	98.88691	97.39146	95.92567	94.48880
10/24/2014	10/24/2018	10/26/2015	1.74000	102.76427	102.76427	101.96981	100.41279	98.88691	97.39146	95.92567	94.48880
2/20/2015	2/20/2019	2/22/2016	1.79000	103.43532	103.43532	102.31230	100.43116	98.59347	96.79808	95.04376	93.32935
3/26/2015	3/26/2019	3/29/2016	1.61000	103.24186	103.24186	102.02215	100.05307	98.13161	96.25641	94.42606	92.63924
3/26/2015	3/26/2020	3/29/2016	1.59000	104.81782	104.81782	102.37912	99.44437	96.60862	93.86808	91.21904	88.65797
6/29/2015	7/1/2019	6/29/2017	0.87189	105.78872	105.78872	104.26079	102.00610	100.19861	99.53094	99.26255	99.02027
7/30/2015	7/30/2019	8/1/2016	1.80000	104.25440	104.25440	102.64332	100.33350	98.08670	95.90097	93.77431	91.70483
8/14/2015	8/14/2025	8/14/2020	1.85000	115.71246	111.30354	105.83795	101.32906	97.50103	94.10264	90.98074	88.04955
8/19/2015	8/19/2025	8/21/2017	0.99000	108.42107	105.59301	102.17225	100.31232	99.62153	99.21727	98.83669	98.45952
8/25/2015	8/25/2020	8/25/2017	0.95000	103.27927	103.27927	101.33809	100.09119	99.57335	99.17557	98.78528	98.39810
8/26/2015	8/26/2025	8/26/2020	1.75000	114.92135	110.62200	105.26128	100.82666	97.04106	93.66088	90.54196	87.60543
9/14/2015	9/14/2020	9/14/2017	1.05000	103.68287	103.68287	101.59290	100.18375	99.54957	99.09077	98.64818	98.20993
9/15/2015	9/16/2019	9/15/2016	1.75000	104.36951	104.36951	102.59888	100.16397	97.79889	95.50135	93.26904	91.09974
9/18/2015	9/18/2020	9/18/2017	1.09000	103.83531	103.83531	101.68984	100.22240	99.55646	99.08429	98.63109	98.18255
9/29/2015	9/30/2019	9/29/2016	1.61000	104.08250	104.08250	102.26762	99.79966	97.40358	95.07697	92.81740	90.62259
10/2/2015	10/2/2020	10/2/2017	0.89000	103.16603	103.16603	101.24591	100.01285	99.39653	98.89522	98.40638	97.92258
10/2/2015	10/2/2025	10/2/2020	1.69000	114.58336	110.28526	104.94135	100.48995	96.65919	93.21922	90.03586	87.03557
11/6/2015	11/6/2020	11/6/2017	1.05000	103.83742	103.83742	101.63905	100.15103	99.36714	98.76369	98.18600	97.61622
11/6/2015	11/7/2022	11/6/2018	1.40000	107.95910	106.94325	103.23635	100.52116	98.51504	96.84108	95.30384	93.82851
12/4/2015	12/4/2025	12/4/2018	1.36000	111.97326	108.10158	103.72828	100.64639	98.42776	96.62337	94.99530	93.44651
12/8/2015	12/8/2020	6/8/2017	1.38000	105.16639	105.16639	102.55016	100.66535	99.94818	99.72314	99.53608	99.34998
12/11/2015	12/12/2022	12/11/2017	0.62956	109.97801	108.64571	104.37726	101.62048	100.01344	99.15314	98.61602	98.18376
12/15/2015	12/16/2019	6/15/2017	1.39000	103.82181	103.82181	102.09882	100.52829	99.92358	99.69485	99.48901	99.28408
12/15/2015	12/15/2022	12/15/2017	0.63122	109.97161	108.63011	104.35703	101.61291	100.10630	99.45082	99.14710	98.93564
12/18/2015	12/18/2020	12/18/2017	0.90178	106.89286	106.89286	103.89944	101.62988	100.26265	99.61453	99.29612	99.07168
12/24/2015	12/24/2020	12/26/2017	1.25000	104.73516	104.73516	102.19037	100.38556	99.36566	98.60808	97.90216	97.21037
12/24/2015	12/24/2025	12/24/2020	1.99000	117.63123	112.54126	106.67523	101.79332	97.60640	93.87391	90.44702	87.23915
1/12/2016	1/13/2020	4/12/2017	1.77000	105.28723	105.28723	103.30396	101.29072	100.17064	99.96716	99.93390	99.90069
1/19/2016	1/19/2021	1/19/2018	1.15000	104.43931	104.43931	101.94418	100.22144	99.19898	98.39216	97.62946	96.88188
1/19/2016	1/20/2026	1/22/2019	1.35000	112.06142	108.08035	103.63571	100.35347	97.83425	95.69742	93.74174	91.88086
1/22/2016	1/22/2020	4/24/2017	1.46000	104.16434	104.16434	102.30852	100.62854	99.98228	99.90714	99.84072	99.77441
1/29/2016	1/29/2021	5/1/2017	1.42000	105.52124	105.52124	102.71562	100.72428	99.99349	99.87690	99.79128	99.70581
2/2/2016	2/2/2021	2/2/2018	0.43456	106.33782	106.33782	103.28728	101.23818	100.07461	99.57698	99.38707	99.29313
2/26/2016	2/26/2021	2/26/2018	0.89000	103.52934	103.52934	101.29609	99.79946	98.79602	97.91161	97.05532	96.21505
2/26/2016	2/26/2026	2/26/2021	1.49000	113.46557	109.06871	103.71197	99.14682	95.12110	91.44464	88.01215	84.76691
3/8/2016	3/8/2023	3/8/2018	0.99000	105.96047	104.94132	101.90397	100.03172	98.87682	97.93965	97.05491	96.19061
3/18/2016	3/18/2020	6/19/2017	1.62000	104.87274	104.87274	102.79632	100.90321	100.02213	99.72969	99.51187	99.29611
4/5/2016	4/5/2021	4/12/2017	0.99000	104.03048	104.03048	100.56919	99.69193	98.70693	97.74023	96.79131	95.85969
4/8/2016	4/8/2020	4/10/2017	0.40928	103.72030	103.72030	101.83002	100.35190	99.96212	99.93440	99.90672	99.87906
4/12/2016	4/12/2021	4/12/2017	0.41789	103.99007	103.99007	101.54737	100.17048	99.95212	99.91887	99.88565	99.85248
4/28/2016	4/28/2020	4/28/2017	0.43900	104.32602	104.32602	102.24676	100.51960	99.88999	99.81248	99.73509	99.65782
4/28/2016	4/28/2021	4/28/2017	0.43900	105.30893	105.30893	102.39026	100.49886	99.88999	99.81248	99.73509	99.65782
4/28/2016	4/28/2021	4/30/2018	0.43900	106.29756	106.29756	102.78948	100.65306	99.67672	99.34103	99.21291	99.13270
5/2/2016	5/2/2023	5/4/2018	0.43456	108.00235	106.38855	102.59104	100.62642	99.70356	99.33674	99.17682	99.07679
5/2/2016	5/4/2026	5/2/2017	0.43456	108.16741	105.08107	101.85347	100.20400	99.87533	99.78576	99.69756	99.60953
5/5/2016	5/5/2021	5/7/2018	0.89000	103.69740	103.69740	101.32571	99.67335	98.46592	97.38356	96.33611	95.30714
5/5/2016	5/5/2026	5/5/2021	1.49000	113.74696	109.16034	103.65915	98.94991	94.77540	90.95549	87.38957	84.02223
5/6/2016	5/6/2026	5/8/2017	0.43372	106.88895	104.20555	101.38082	100.06737	99.85283	99.74849	99.64439	99.54052
5/10/2016	5/11/2026	5/10/2017	0.49000	104.52748	102.66717	100.68598	99.97083	99.84966	99.74000	99.63059	99.52144
5/12/2016	5/12/2026	5/12/2017	0.49000	104.52884	102.66688	100.68332	99.96826	99.84231	99.72733	99.61263	99.49821

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
5/13/2016	5/13/2026	5/15/2017	0.43372	107.26259	104.44459	101.49154	100.08148	99.82625	99.70330	99.58066	99.45835
5/17/2016	5/17/2021	5/17/2018	0.44178	105.90343	105.90343	102.40205	100.41379	99.52833	99.19319	99.02716	98.90049
5/20/2016	5/20/2026	5/22/2017	0.59000	105.46665	103.26047	100.92621	99.99166	99.82002	99.67844	99.53727	99.39652
6/3/2016	6/3/2026	6/5/2017	0.44278	107.83731	104.81864	101.68532	100.12558	99.74933	99.56693	99.38849	99.21070
6/6/2016	6/8/2020	6/6/2017	0.45000	105.02393	105.02393	102.72918	100.75096	99.83342	99.56070	99.37797	99.19749
6/6/2016	6/6/2031	6/6/2017	0.59000	106.93162	103.77553	101.10653	99.97983	99.66729	99.42375	99.18265	98.94296
6/8/2016	6/8/2026	6/8/2017	0.59000	105.49777	103.27898	100.94305	99.98971	99.75940	99.57208	99.38548	99.19959
6/14/2016	6/16/2031	6/14/2017	0.49000	105.72440	103.05587	100.79026	99.94487	99.71605	99.51239	99.30958	99.10761
6/16/2016	6/16/2020	6/16/2017	0.48733	104.82230	104.82230	102.09467	100.07569	99.70804	99.49829	99.29008	99.08274
6/16/2016	6/16/2026	6/18/2018	0.69000	106.44531	103.88710	101.14258	99.33896	98.01578	96.82561	95.67488	94.54572
6/16/2016	6/16/2031	6/16/2021	1.21000	114.69474	108.76701	102.72869	97.77270	93.45989	89.54966	85.91632	82.49398
6/24/2016	6/24/2026	6/26/2017	0.59000	105.52398	103.27677	100.92218	99.96454	99.69171	99.45532	99.22005	98.98591
6/27/2016	6/27/2031	6/27/2018	0.69000	108.17633	104.50686	101.34858	99.36915	97.97711	96.75384	95.57879	94.42749
6/27/2016	6/27/2031	6/27/2019	0.91000	110.91366	106.22976	102.02165	98.89988	96.40969	94.20429	92.13467	90.14470
6/30/2016	6/30/2020	6/30/2017	0.55222	104.67498	104.67498	101.91542	100.02573	99.66716	99.41990	99.17386	98.92904
6/30/2016	6/30/2021	6/30/2017	0.59000	102.54248	102.52958	100.70840	99.94343	99.67668	99.42940	99.18335	98.93851
7/8/2016	7/8/2026	7/10/2017	0.45000	104.23017	102.45103	100.59752	99.88549	99.59409	99.32067	99.04881	98.77845
7/14/2016	7/14/2021	7/14/2017	0.37317	104.35798	104.31550	101.54331	100.16255	99.85313	99.80600	99.77260	99.73970
7/22/2016	7/22/2026	7/24/2017	0.55000	105.19208	103.03269	100.82275	99.90506	99.55978	99.24957	98.94151	98.63536
7/22/2016	7/22/2026	7/24/2017	0.55000	105.19208	103.03269	100.82275	99.90506	99.55978	99.24957	98.94151	98.63536
7/28/2016	7/28/2026	7/30/2018	0.33900	110.01395	105.51911	101.70699	100.01628	99.31196	99.04538	98.92454	98.84446
8/1/2016	8/1/2031	8/1/2017	0.49000	105.73538	103.06475	100.81260	99.87857	99.50373	99.17232	98.84371	98.51728
8/11/2016	8/11/2026	8/13/2018	0.81000	107.69258	104.65493	101.53210	99.42976	97.89163	96.53915	95.24721	93.98529
8/12/2016	8/12/2021	8/14/2017	0.23372	104.48967	104.40100	101.55572	100.09934	99.67304	99.53590	99.42263	99.31058
8/19/2016	8/19/2021	8/21/2017	0.25233	104.65878	104.56016	101.64471	100.11730	99.64224	99.48220	99.35023	99.21975
9/2/2016	9/2/2026	9/5/2017	0.69000	106.59465	103.92253	101.24771	99.95684	99.41823	98.99102	98.57264	98.15788
9/9/2016	9/9/2026	9/10/2018	0.80000	107.66157	104.61531	101.48508	99.33476	97.72742	96.30449	94.94529	93.61906
9/9/2016	9/9/2031	9/11/2017	0.39000	104.55773	102.38350	100.53974	99.71385	99.24909	98.81121	98.37762	97.94785
9/12/2016	9/12/2031	9/12/2017	0.39000	104.55965	102.38153	100.53703	99.71073	99.24356	98.80303	98.36685	97.93451
9/15/2016	9/15/2026	9/16/2019	0.99000	109.49806	105.85234	101.90506	98.75816	96.12445	93.74242	91.49469	89.33415
9/15/2016	9/15/2026	9/16/2019	0.99000	109.49806	105.85234	101.90506	98.75816	96.12445	93.74242	91.49469	89.33415
9/16/2016	9/16/2021	9/18/2017	0.28733	105.20028	105.06155	101.95083	100.19426	99.51881	99.25130	99.04155	98.83667
9/22/2016	9/22/2031	9/22/2017	0.39000	104.56365	102.37683	100.52306	99.68121	99.18831	98.72135	98.25919	97.80135
9/22/2016	9/22/2031	9/24/2018	0.65000	107.74960	104.23556	101.13801	99.02128	97.41334	95.96786	94.57944	93.22309
9/26/2016	9/26/2031	9/26/2017	0.42000	104.92951	102.57972	100.59090	99.69048	99.18124	98.70350	98.23091	97.76285
10/3/2016	10/5/2026	10/3/2017	0.59000	105.67470	103.31404	100.95780	99.81003	99.23408	98.73491	98.24416	97.75836
10/7/2016	10/7/2026	10/10/2017	0.69000	106.63720	103.93028	101.24250	99.89608	99.25775	98.73668	98.22820	97.72516
10/21/2016	10/21/2031	10/23/2017	0.55000	106.50680	103.49410	100.96004	99.74329	99.11514	98.56522	98.02479	97.49036
1/13/2017	1/13/2022	1/16/2018	0.00178	107.74242	107.31258	103.45855	101.10424	99.84514	99.36146	99.21736	99.17138
1/13/2017	1/13/2027	1/14/2019	1.31000	112.81111	108.15048	103.65327	100.48122	98.16836	96.26598	94.54174	92.90065
1/20/2017	1/22/2024	1/22/2019	0.00011	111.42059	108.40150	103.91437	101.28324	99.67200	98.79611	98.35950	98.14965
1/20/2017	1/20/2032	1/22/2018	0.93000	111.38737	106.49372	102.46681	100.21616	99.04115	98.19970	97.42680	96.67262
1/24/2017	1/24/2024	1/24/2019	0.00344	112.30152	109.18248	104.54048	101.72519	99.93747	98.92531	98.39807	98.13437