

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
5/18/2007	5/18/2017	5/18/2017	4.19000	100.20949	100.20949	100.20949	100.16750	100.11904	100.07063	100.02229	99.97401
5/29/2007	5/30/2017	5/30/2017	4.25000	100.35415	100.35415	100.35415	100.28418	100.20343	100.12281	100.04233	99.96197
6/7/2007	6/7/2017	6/7/2017	4.82000	100.50875	100.50875	100.50875	100.41784	100.31487	100.21212	100.10960	100.00729
6/8/2007	6/8/2017	6/8/2017	4.49000	100.48639	100.48639	100.48639	100.39285	100.28714	100.18166	100.07641	99.97140
6/18/2007	6/19/2017	6/19/2017	4.50000	100.62497	100.62497	100.62497	100.50226	100.36597	100.23007	100.09455	99.95941
6/19/2007	6/19/2017	6/19/2017	4.65000	100.64580	100.64580	100.64580	100.52307	100.38676	100.25083	100.11529	99.98013
6/22/2007	6/22/2017	6/22/2017	4.50000	100.66246	100.66246	100.66246	100.53180	100.38718	100.24299	100.09923	99.95589
6/28/2007	6/28/2017	6/28/2017	4.50000	100.73746	100.73746	100.73746	100.59089	100.42961	100.26885	100.10861	99.94889
7/13/2007	7/13/2017	7/13/2017	4.29000	100.88178	100.88178	100.88178	100.69077	100.48907	100.28820	100.08814	99.88890
7/20/2007	7/20/2017	7/20/2017	4.29000	100.96519	100.96519	100.96519	100.75309	100.53261	100.31311	100.09458	99.87702
7/27/2007	7/27/2017	7/27/2017	4.25000	101.03883	101.03883	101.03883	100.80565	100.56641	100.32832	100.09136	99.85553
7/30/2007	1/30/2019	7/31/2017	3.99000	107.09288	107.09288	106.05653	104.29688	102.65315	101.27223	100.32741	99.99803
7/31/2007	7/31/2017	7/31/2017	3.99000	101.01960	101.01960	101.01960	100.77447	100.52461	100.27600	100.04616	99.99803
7/31/2007	7/31/2017	7/31/2017	3.99000	101.01960	101.01960	101.01960	100.77447	100.52461	100.27600	100.04616	99.99803
7/31/2007	7/31/2017	7/31/2017	4.06000	101.03749	101.03749	101.03749	100.79233	100.54245	100.29380	100.05514	99.99822
8/2/2007	8/2/2017	5/2/2017	4.05000	101.05744	101.05744	101.05603	100.80509	100.54985	100.29592	100.05503	99.99631
8/9/2007	8/9/2017	5/9/2017	3.99000	101.11935	101.11935	101.11304	100.84186	100.56793	100.29550	100.05159	99.98196
8/16/2007	8/16/2017	5/16/2017	3.99000	101.19693	101.19693	101.18572	100.89429	100.60164	100.31071	100.05616	99.96802
8/17/2007	8/17/2017	5/17/2017	4.00000	101.21104	101.21104	101.19913	100.90480	100.60948	100.31590	100.05855	99.96650
9/4/2007	9/5/2017	6/5/2017	3.89000	101.38302	101.38302	101.35540	101.00669	100.66029	100.31716	100.04379	99.91551
9/10/2007	9/11/2017	6/12/2017	3.69000	101.37341	101.37341	101.33870	100.97340	100.61066	100.25310	100.00353	99.87149
9/11/2007	9/11/2017	6/12/2017	3.59000	101.33619	101.33619	101.30148	100.93627	100.57360	100.22131	99.98630	99.85961
9/13/2007	9/13/2017	6/13/2017	3.99000	101.50724	101.50724	101.47015	101.09903	100.73053	100.36575	100.06469	99.90552
9/27/2007	9/27/2017	6/27/2017	3.65000	101.52073	101.52073	101.46712	101.05725	100.65061	100.25954	99.98530	99.81392
10/11/2007	10/11/2017	7/11/2017	3.99000	101.81755	101.81755	101.74502	101.29672	100.85227	100.42008	100.07303	99.83692
10/15/2007	10/16/2017	7/17/2017	3.99000	101.87297	101.87297	101.79346	101.33164	100.87392	100.42955	100.07131	99.82166
10/26/2007	10/26/2017	7/26/2017	3.39000	101.68546	101.68546	101.59208	101.10409	100.62123	100.19193	99.89103	99.65131
11/5/2007	11/6/2017	5/5/2017	4.39000	102.31681	102.31681	102.20874	101.68902	101.17450	100.67211	100.22990	99.99550
11/6/2007	11/6/2017	5/8/2017	3.48000	101.83654	101.83654	101.72862	101.21031	100.69960	100.24205	99.99418	99.97272
11/19/2007	11/20/2017	11/19/2012	4.29000	102.43086	102.43086	102.30512	101.74640	101.19368	100.64698	100.10621	99.57127
11/20/2007	11/20/2017	5/22/2017	3.74000	102.11919	102.11919	101.99358	101.43583	100.88515	100.37285	100.03635	99.94094
11/23/2007	11/24/2017	11/23/2011	3.99000	102.30519	102.30519	102.17448	101.60512	101.04201	100.48516	99.93446	99.38981
11/23/2007	11/24/2017	11/23/2011	3.99000	102.30519	102.30519	102.17448	101.60512	101.04201	100.48516	99.93446	99.38981
11/29/2007	11/29/2017	5/30/2017	2.95000	101.74527	101.74527	101.60853	101.02727	100.46851	100.06642	99.93433	99.85406
11/30/2007	11/30/2017	5/30/2017	3.19000	101.89613	101.89613	101.75807	101.17354	100.60379	100.13311	99.95427	99.87398
12/10/2007	12/11/2017	6/12/2017	3.45000	102.15609	102.15609	102.00313	101.38845	100.78685	100.26114	99.97369	99.84297
12/24/2007	12/26/2017	12/24/2012	3.99000	102.65983	102.65983	102.48643	101.83005	101.18198	100.54217	99.91047	99.28672
1/7/2008	1/8/2018	7/7/2017	2.59000	101.82002	101.82002	101.62922	100.94367	100.32985	99.96691	99.76357	99.58025
1/8/2008	1/8/2018	7/10/2017	2.57000	101.80597	101.80597	101.61517	100.92982	100.31884	99.95757	99.74835	99.55722
1/8/2008	1/8/2018	7/10/2017	2.64000	101.85516	101.85516	101.66433	100.97831	100.35740	99.97695	99.76221	99.57093
1/11/2008	1/11/2018	7/11/2017	2.72000	101.93405	101.93405	101.73897	101.04425	100.40652	99.99975	99.77486	99.58054
1/14/2008	1/16/2018	7/14/2017	3.24000	102.34882	102.34882	102.14645	101.43562	100.74806	100.19673	99.88295	99.67034
1/16/2008	1/16/2018	7/17/2017	2.38000	101.72532	101.72532	101.52339	100.81928	100.22413	99.89761	99.68045	99.47136
1/17/2008	1/17/2018	7/17/2017	2.25000	101.63732	101.63732	101.43406	100.73019	100.16235	99.86635	99.65244	99.44339
1/18/2008	1/18/2018	7/18/2017	2.29000	101.67279	101.67279	101.46811	100.76059	100.18093	99.87383	99.65647	99.44481
2/14/2008	2/14/2018	2/14/2012	3.19000	102.56952	102.56952	102.32874	101.53598	100.75542	99.98686	99.23005	98.48469
3/7/2008	3/7/2018	6/7/2017	3.55000	103.06659	103.06659	102.79631	101.94212	101.11679	100.41142	100.01644	99.87452
3/14/2008	3/14/2018	6/14/2017	2.40000	102.11978	102.11978	101.83870	100.98078	100.27277	99.95446	99.82540	99.70423
3/17/2008	3/19/2018	6/19/2017	3.30000	102.96061	102.96061	102.67017	101.78527	100.94158	100.26954	99.94362	99.79369
4/28/2008	4/30/2018	7/28/2017	2.15000	102.17961	102.17961	101.81524	100.85239	100.15209	99.81913	99.57636	99.33876
4/30/2008	4/30/2018	7/30/2017	3.74000	103.79169	103.79169	103.42481	102.42171	101.43798	100.47317	99.52673	98.59815
5/23/2008	5/23/2018	5/23/2017	3.27000	103.52406	103.52406	103.11333	102.04973	101.05287	100.28444	99.96995	99.90834
6/30/2008	7/2/2018	6/30/2011	3.69000	104.38670	104.38670	103.89150	102.70905	101.54535	100.40010	99.27288	98.16332
7/11/2008	7/11/2018	7/11/2012	3.75000	104.55178	104.55178	104.03555	102.82803	101.63992	100.47090	99.32055	98.18846
7/14/2008	7/16/2018	7/14/2017	2.50000	103.06914	103.06914	102.54511	101.36931	100.43050	99.95161	99.71887	99.51702
7/14/2008	7/16/2018	7/14/2017	3.25000	103.98997	103.98997	103.46342	102.25395	101.14291	100.32189	99.90321	99.67314
7/17/2008	7/17/2018	5/14/2017	3.75000	104.61427	104.61427	104.08412	102.86018	101.65611	100.47156	99.30609	98.15930
8/15/2008	8/15/2018	5/15/2017	3.83000	105.02122	105.02122	104.42203	103.12161	101.88452	100.83568	100.15692	99.96336
12/27/2011	12/27/2021	12/29/2014	3.55000	116.78235	116.69705	111.83215	107.12157	102.64009	99.83547	94.31613	90.45116
5/15/2012	5/15/2017	11/17/2014	1.95000	100.08124	100.08124	100.08124	100.04632	100.00600	99.96573	99.92551	99.88534
6/20/2012	6/20/2017	6/22/2015	1.63000	100.23088	100.23088	100.23088	100.10594	99.96735	99.82915	99.69135	99.55395

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
7/16/2012	7/17/2017	7/16/2014	1.72000	100.37261	100.37261	100.37261	100.17032	99.95873	99.74804	99.53826	99.32937
7/18/2012	7/18/2018	7/20/2015	2.72000	103.35436	103.35436	102.82438	101.60581	100.40710	99.22787	98.06769	96.92613
7/19/2012	7/19/2017	7/21/2014	1.69000	100.14547	100.14547	100.14547	99.93760	99.72111	99.50557	99.29098	99.07733
10/1/2012	10/1/2019	4/1/2015	2.25000	105.52438	105.52438	103.81191	101.40282	99.06162	96.78609	94.57402	92.42331
10/5/2012	10/5/2017	10/6/2014	1.63000	100.71528	100.71528	100.65131	100.22181	99.79594	99.37368	98.95499	98.53983
3/8/2013	3/8/2018	3/9/2015	1.78000	101.54245	101.54245	101.27203	100.42189	99.58593	98.76385	97.95529	97.15994
5/7/2014	5/7/2018	5/7/2015	1.76000	101.81841	101.81841	101.44083	100.42857	99.43494	98.45947	97.50167	96.56107
10/16/2014	10/16/2018	10/17/2016	2.48000	103.67829	103.67829	102.93118	101.47038	100.03733	98.63136	97.25177	95.89790
10/24/2014	10/24/2018	10/26/2015	1.74000	102.61929	102.61929	101.85473	100.38114	98.93597	97.51852	96.12806	94.76389
10/24/2014	10/24/2018	10/26/2015	1.74000	102.61929	102.61929	101.85473	100.38114	98.93597	97.51852	96.12806	94.76389
2/20/2015	2/20/2019	2/22/2016	1.79000	103.28618	103.28618	102.21229	100.41402	98.65573	96.93635	95.25481	93.61007
3/26/2015	3/26/2019	3/29/2016	1.61000	103.10771	103.10771	101.94345	100.05663	98.21368	96.41335	94.65441	92.93568
3/26/2015	3/26/2020	3/29/2016	1.59000	104.68534	104.68534	102.43164	99.57524	96.81269	94.14046	91.55513	89.05342
6/29/2015	7/1/2019	6/29/2017	0.87189	105.71609	105.71609	104.27044	102.09654	100.26342	99.68037	99.50840	99.34669
7/30/2015	7/30/2019	8/1/2016	1.80000	104.10443	104.10443	102.58546	100.35766	98.18884	96.07719	94.02090	92.01823
8/14/2015	8/14/2025	8/14/2020	1.85000	115.55832	111.79520	106.22257	101.66019	97.82680	94.45105	91.36624	88.47842
8/19/2015	8/19/2025	8/21/2017	0.99000	108.33859	105.89465	102.27152	100.32683	99.70408	99.38557	99.08499	98.78637
8/25/2015	8/25/2020	8/25/2017	0.95000	103.20013	103.20013	101.31165	100.08591	99.66307	99.34824	99.03749	98.72869
8/26/2015	8/26/2025	8/26/2020	1.75000	114.77554	111.09717	105.63563	101.15258	97.36643	94.01235	90.93262	88.04043
9/14/2015	9/14/2020	9/14/2017	1.05000	103.59539	103.59539	101.57211	100.17434	99.62986	99.25540	98.89199	98.53139
9/15/2015	9/16/2019	9/15/2016	1.75000	104.22370	104.22370	102.56347	100.20974	97.92144	95.69644	93.53264	91.42805
9/18/2015	9/18/2020	9/18/2017	1.09000	103.74450	103.74450	101.67121	100.21062	99.63280	99.24536	98.87130	98.50027
9/29/2015	9/30/2019	9/29/2016	1.61000	103.94836	103.94836	102.24925	99.86197	97.54205	95.28726	93.09543	90.96445
10/2/2015	10/2/2020	10/2/2017	0.89000	103.09188	103.09188	101.22050	100.01747	99.49084	99.07183	98.66146	98.25458
10/2/2015	10/2/2025	10/2/2020	1.69000	114.44255	110.73908	105.31938	100.82474	96.99638	93.58354	90.43889	87.48185
11/6/2015	11/6/2020	11/6/2017	1.05000	103.74994	103.74994	101.62310	100.14418	99.44041	98.91947	98.41966	97.92567
11/6/2015	11/7/2022	11/6/2018	1.40000	107.84245	107.16278	103.34850	100.59259	98.61587	97.00348	95.53686	94.13292
12/4/2015	12/4/2025	12/4/2018	1.36000	111.85995	108.50391	103.94604	100.77399	98.55654	96.80029	95.23708	93.75737
12/8/2015	12/8/2020	6/8/2017	1.38000	105.05141	105.05141	102.55288	100.63969	99.97336	99.84572	99.74082	99.63615
12/11/2015	12/12/2022	12/11/2017	0.62956	109.92616	109.00829	104.64977	101.80222	100.16658	99.34315	98.87426	98.51801
12/15/2015	12/16/2019	6/15/2017	1.39000	103.70600	103.70600	102.05007	100.48545	99.95215	99.81673	99.69266	99.56890
12/15/2015	12/15/2022	12/15/2017	0.63122	109.91953	108.99215	104.63068	101.79107	100.24729	99.63204	99.40385	99.27378
12/18/2015	12/18/2020	12/18/2017	0.90178	106.81810	106.81810	104.01636	101.72940	100.36549	99.77067	99.53073	99.38852
12/24/2015	12/24/2020	12/26/2017	1.25000	104.63101	104.63101	102.19089	100.37434	99.41761	98.74027	98.11145	97.49392
12/24/2015	12/24/2025	12/24/2020	1.99000	117.46543	113.07871	107.12373	102.18434	97.98555	94.26883	90.87253	87.70242
1/12/2016	1/13/2020	7/12/2017	1.87000	105.13142	105.13142	103.25227	101.24689	100.15980	99.80257	99.59930	99.40339
1/19/2016	1/19/2021	1/19/2018	1.15000	104.34349	104.34349	101.94241	100.21561	99.25983	98.53196	97.84528	97.17104
1/19/2016	1/20/2026	1/22/2019	1.35000	111.94894	108.49134	103.87135	100.50958	97.99327	95.90014	94.00406	92.20711
1/22/2016	1/22/2020	7/24/2017	1.46000	104.04269	104.04269	102.26574	100.58823	99.91923	99.66247	99.43425	99.20729
1/29/2016	1/29/2021	7/31/2017	1.42000	105.40293	105.40293	102.72890	100.70186	99.99893	99.99625	99.99357	99.99089
2/2/2016	2/2/2021	2/2/2018	0.43456	106.30040	106.30040	103.43436	101.35547	100.19852	99.75333	99.63921	99.62727
2/26/2016	2/26/2021	2/26/2018	0.89000	103.45519	103.45519	101.28574	99.80889	98.88053	98.07386	97.29200	96.52344
2/26/2016	2/26/2026	2/26/2021	1.49000	113.34142	109.52513	104.11386	99.52170	95.50815	91.86297	88.46965	85.26580
3/8/2016	3/8/2023	3/8/2018	0.99000	105.87800	105.12670	101.95552	100.05369	98.95638	98.09493	97.28435	96.49154
3/18/2016	3/18/2020	6/19/2017	1.62000	104.73776	104.73776	102.76270	100.86512	100.02439	99.83140	99.69634	99.56166
4/5/2016	4/5/2021	7/12/2017	0.99000	103.94800	103.94800	100.41032	99.69649	98.79240	97.90461	97.03269	96.17621
4/28/2016	4/28/2020	7/28/2017	1.41000	104.28407	104.28407	102.29491	100.55984	99.89617	99.63312	99.39455	99.15723
4/28/2016	4/28/2021	7/28/2017	1.30000	105.26759	105.26759	102.47729	100.54557	99.86715	99.60598	99.36753	99.13025
4/28/2016	4/28/2021	4/30/2018	0.57178	106.55642	106.55642	103.25038	100.79657	99.56251	99.04589	98.75846	98.52400
5/2/2016	5/2/2023	5/4/2018	0.43456	107.96494	106.76702	102.79426	100.74038	99.82308	99.52291	99.45099	99.44296
5/2/2016	5/4/2026	5/2/2017	0.43456	108.13122	105.42147	101.97824	100.23463	99.99239	99.98702	99.98166	99.97630
5/5/2016	5/5/2021	5/7/2018	0.89000	103.62326	103.62326	101.32550	99.69733	98.57087	97.57913	96.62345	95.68723
5/5/2016	5/5/2026	5/5/2021	1.49000	113.62282	109.62994	104.08791	99.35434	95.19225	91.40288	87.87496	84.54778
5/6/2016	5/6/2026	5/8/2017	0.43372	106.85283	104.49101	101.45972	100.09312	99.97131	99.94985	99.92841	99.90700
5/10/2016	5/11/2026	5/10/2017	0.49000	104.48666	102.84037	100.68603	99.99035	99.96350	99.93668	99.90988	99.88312
5/12/2016	5/12/2026	5/12/2017	0.49000	104.48802	102.83945	100.68358	99.98842	99.95620	99.92402	99.89187	99.85976
5/13/2016	5/13/2026	5/15/2017	0.43372	107.22647	104.74539	101.58377	100.10820	99.94489	99.90467	99.86451	99.82439
5/17/2016	5/17/2021	5/17/2018	0.44178	105.86604	105.86604	102.59417	100.52301	99.63907	99.36931	99.28867	99.25011
5/20/2016	5/20/2026	5/22/2017	0.59000	105.41750	103.46501	100.94409	99.99398	99.92583	99.86686	99.80798	99.74917
6/3/2016	6/3/2026	6/5/2017	0.44278	107.80044	105.13507	101.79831	100.15571	99.86498	99.76750	99.67091	99.57451
6/6/2016	6/8/2020	6/6/2017	0.45000	104.98645	104.98645	102.80578	100.81615	99.92915	99.75906	99.65973	99.56061

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
6/6/2016	6/6/2031	6/6/2017	0.59000	107.41298	104.05927	101.16124	99.99653	99.77706	99.61577	99.45582	99.29661
6/8/2016	6/8/2026	6/8/2017	0.59000	105.44863	103.47331	100.96316	100.00017	99.86544	99.76039	99.65557	99.55098
6/14/2016	6/16/2031	6/14/2017	0.49000	106.13340	103.28453	100.81744	99.96723	99.83041	99.70888	99.58766	99.46675
6/16/2016	6/16/2020	6/16/2017	0.48733	104.78171	104.78171	102.26078	100.09015	99.82199	99.69497	99.56828	99.44193
6/16/2016	6/16/2026	6/18/2018	0.69000	106.38783	104.11103	101.20287	99.39391	98.13612	97.02304	95.94858	94.89375
6/16/2016	6/16/2031	6/16/2021	1.21000	115.53766	109.36341	103.25606	98.24406	93.92671	90.03727	86.43610	83.05008
6/24/2016	6/24/2026	6/26/2017	0.59000	105.47484	103.46584	100.94262	99.97823	99.79781	99.64332	99.48931	99.33579
6/27/2016	6/27/2031	6/27/2018	0.69000	108.71875	104.83569	101.45643	99.43832	98.10091	96.95226	95.85291	94.77554
6/27/2016	6/27/2031	6/27/2019	0.91000	111.59126	106.67211	102.26391	99.07615	96.60463	94.45130	92.44417	90.51835
6/30/2016	6/30/2020	6/30/2017	0.55222	104.62898	104.62898	102.06456	100.03724	99.77640	99.61095	99.44604	99.28169
6/30/2016	6/30/2021	6/30/2017	0.59000	102.49334	102.49334	100.68501	99.95926	99.78279	99.61733	99.45242	99.28805
7/8/2016	7/8/2026	7/10/2017	0.45000	104.19269	102.60134	100.59425	99.91806	99.71515	99.52334	99.33228	99.14197
7/14/2016	7/14/2021	7/14/2017	0.50844	104.61366	104.61366	101.86795	100.19761	99.71751	99.50732	99.30578	99.10507
7/22/2016	7/22/2026	7/24/2017	0.55000	105.14627	103.22790	100.83404	99.93185	99.67714	99.44840	99.22072	98.99409
7/22/2016	7/22/2026	7/24/2017	0.55000	105.14627	103.22790	100.83404	99.93185	99.67714	99.44840	99.22072	98.99409
7/28/2016	7/28/2026	7/30/2018	0.47178	110.28114	106.34188	102.20654	100.14433	99.18640	98.72529	98.42923	98.17880
8/1/2016	8/1/2031	8/1/2017	0.49000	106.15638	103.31307	100.83817	99.91458	99.62841	99.37849	99.13000	98.88275
8/11/2016	8/11/2026	8/13/2018	0.81000	107.62510	104.94036	101.62680	99.49694	98.01188	96.73188	95.51400	94.32426
8/12/2016	8/12/2021	8/14/2017	0.23372	104.46939	104.46939	101.63651	100.13768	99.79078	99.74296	99.71260	99.68284
8/19/2016	8/19/2021	8/21/2017	0.25233	104.63724	104.63724	101.73544	100.16090	99.76207	99.69200	99.64283	99.59438
9/2/2016	9/2/2026	9/5/2017	0.69000	106.53727	104.16074	101.29080	99.98352	99.53095	99.18590	98.84666	98.50977
9/9/2016	9/9/2026	9/10/2018	0.80000	107.59536	104.88549	101.58273	99.40740	97.85223	96.50060	95.21433	93.95910
9/9/2016	9/9/2031	9/11/2017	0.39000	104.89969	102.56520	100.54636	99.76676	99.38807	99.03051	98.67570	98.32345
9/12/2016	9/12/2031	9/12/2017	0.39000	104.90013	102.56205	100.54359	99.76367	99.38251	99.02227	98.66484	98.30999
9/15/2016	9/15/2026	9/16/2019	0.99000	109.41630	106.18216	102.11244	98.93622	96.33371	94.00599	91.81908	89.71950
9/15/2016	9/15/2026	9/16/2019	0.99000	109.41630	106.18216	102.11244	98.93622	96.33371	94.00599	91.81908	89.71950
9/16/2016	9/16/2021	9/18/2017	0.28733	105.17682	105.17682	102.06523	100.26170	99.64607	99.46826	99.34120	99.21715
9/22/2016	9/22/2031	9/22/2017	0.39000	104.90290	102.55577	100.52948	99.73424	99.32695	98.94004	98.55631	98.17555
9/22/2016	9/22/2031	9/24/2018	0.65000	108.27695	104.54904	101.24922	99.10631	97.55131	96.17705	94.86095	93.57491
9/26/2016	9/26/2031	9/26/2017	0.42000	105.29087	102.77324	100.60284	99.74059	99.31720	98.91950	98.52523	98.13411
10/3/2016	10/5/2026	10/3/2017	0.59000	105.64357	103.51323	100.98221	99.84478	99.35436	98.93601	98.52349	98.11445
10/7/2016	10/7/2026	10/10/2017	0.69000	106.60433	104.16437	101.28762	99.92440	99.36769	98.92795	98.49762	98.07113
10/21/2016	10/21/2031	10/23/2017	0.55000	106.98162	103.77311	101.00570	99.78119	99.23491	98.76516	98.30238	97.84397
1/13/2017	1/13/2022	1/16/2018	0.13511	108.02802	107.90970	103.98445	101.31238	99.78182	99.09017	98.76964	98.55498
1/13/2017	1/13/2027	1/14/2019	1.31000	112.89728	108.59898	103.89893	100.62767	98.31147	96.45382	94.79188	93.21772
1/20/2017	1/22/2024	1/22/2019	0.12622	111.70937	109.30223	104.58792	101.60867	99.69307	98.56189	97.90681	97.50292
1/20/2017	1/20/2032	1/22/2018	0.93000	112.12089	106.97870	102.65600	100.27834	99.12820	98.35790	97.66025	96.97914
1/24/2017	1/24/2024	1/24/2019	0.11317	112.59090	110.10833	105.24402	102.08273	99.98637	98.70981	97.95776	97.49546
1/30/2017	2/1/2027	1/30/2020	0.00900	119.65889	112.26980	106.37588	102.87020	100.56865	99.14817	98.31842	97.86135
2/17/2017	2/17/2022	2/20/2018	0.04178	108.36556	108.18252	104.14792	101.53862	100.03400	99.38631	99.16412	99.08574
3/7/2017	3/7/2022	3/7/2018	0.10167	108.58651	108.36527	104.29283	101.61595	100.02395	99.28195	98.98012	98.83823
3/7/2017	3/8/2027	3/7/2019	1.50000	114.99319	110.12324	104.95726	101.27807	98.63039	96.52797	94.68299	92.96074
3/20/2017	3/20/2024	3/20/2019	1.55000	110.83096	108.85299	104.36826	101.03179	98.53705	96.48580	94.64437	92.90593
3/20/2017	3/22/2032	3/20/2018	1.04000	113.72155	108.00813	103.26343	100.51014	99.05494	98.07867	97.22418	96.40148
3/27/2017	3/29/2021	3/27/2018	0.00289	106.78323	106.78323	103.69760	101.31252	99.78341	99.00372	98.64342	98.44504
3/31/2017	3/31/2022	4/2/2018	0.14678	108.39395	108.11019	104.05393	101.40422	99.83595	99.07797	98.72601	98.52156
4/10/2017	4/11/2022	4/10/2018	0.15761	108.00047	107.69524	103.71514	101.14174	99.66076	98.95354	98.61258	98.39735
4/13/2017	4/13/2022	4/13/2018	0.15844	107.83363	107.52529	103.57295	101.03656	99.59386	98.90935	98.57372	98.35478
4/13/2017	4/15/2024	4/15/2019	1.45000	110.23678	108.27697	103.92041	100.66361	98.18852	96.11378	94.22849	92.43959
4/13/2017	4/13/2032	4/13/2018	0.99000	113.06144	107.57543	103.00381	100.35127	98.89640	97.87245	96.96158	96.08365
4/28/2017	4/28/2021	4/30/2018	0.17178	106.45614	106.45614	103.35941	101.02393	99.57190	98.81440	98.41355	98.14337
4/28/2017	4/28/2022	4/29/2019	1.59000	108.05470	107.75304	103.85224	100.77948	98.35630	96.27897	94.37081	92.55255
42853	45411	43584	0.17178	111.97610	109.17736	104.45876	101.51713	99.59663	98.42259	97.71176	97.25698