

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
2/2/2007	2/2/2017	2/2/2017	4.69000	100.02605	100.02605	100.02605	100.02238	100.01641	100.01045	100.00449	99.99853
2/20/2007	2/21/2017	2/21/2017	4.85000	100.28290	100.28290	100.28290	100.24435	100.18169	100.11912	100.05664	99.99426
2/20/2007	2/21/2017	2/21/2017	4.39000	100.25607	100.25607	100.25607	100.21753	100.15489	100.09235	100.02990	99.96754
2/23/2007	2/23/2017	2/23/2017	4.25000	100.27151	100.27151	100.27151	100.22931	100.16072	100.09224	100.02386	99.95558
2/23/2007	2/23/2017	2/23/2017	4.35000	100.27790	100.27790	100.27790	100.23569	100.16710	100.09861	100.03022	99.96194
3/16/2007	3/16/2017	3/16/2017	4.09000	100.49986	100.49986	100.49986	100.42021	100.29367	100.16748	100.04161	99.91608
3/23/2007	3/23/2017	3/23/2017	4.29000	100.60771	100.60771	100.60771	100.51566	100.37026	100.22529	100.08074	99.93663
4/9/2007	4/10/2017	4/10/2017	4.15000	100.79537	100.79537	100.79537	100.66921	100.47450	100.28055	100.08737	99.89494
4/12/2007	4/12/2017	4/12/2017	4.25000	100.83814	100.83814	100.83814	100.70798	100.50767	100.30818	100.10949	99.91161
4/13/2007	4/13/2017	4/13/2017	4.45000	100.88995	100.88995	100.88995	100.75775	100.55460	100.35229	100.15081	99.95015
5/18/2007	5/18/2017	2/21/2017	4.19000	101.24529	101.24529	101.24529	101.03357	100.73490	100.43802	100.14291	99.95597
5/29/2007	5/30/2017	2/28/2017	4.25000	101.40478	101.40478	101.40478	101.16262	100.83172	100.50297	100.17638	99.95532
6/7/2007	6/7/2017	3/7/2017	4.82000	101.70030	101.70030	101.70030	101.43489	101.08145	100.73049	100.38246	100.07782
6/8/2007	6/8/2017	3/8/2017	4.49000	101.59635	101.59635	101.59635	101.32820	100.97225	100.61881	100.27031	100.00328
6/18/2007	6/19/2017	3/20/2017	4.50000	101.73740	101.73740	101.73740	101.43715	101.05069	100.66720	100.29017	100.00478
6/19/2007	6/19/2017	3/20/2017	4.65000	101.79532	101.79532	101.79532	101.49497	101.10838	100.72474	100.34675	100.04046
6/22/2007	6/22/2017	3/22/2017	4.50000	101.77490	101.77490	101.77490	101.46590	101.07113	100.67944	100.29463	100.00503
6/28/2007	6/28/2017	3/28/2017	4.50000	101.84990	101.84990	101.84990	101.52340	101.11201	100.70396	100.30364	100.00514
7/13/2007	7/13/2017	4/13/2017	4.29000	101.94230	101.94230	101.94230	101.56856	101.11708	100.67009	100.25889	99.94919
7/20/2007	7/20/2017	4/20/2017	4.29000	102.02571	102.02571	102.02571	101.62959	101.15939	100.69410	100.26663	99.94079
7/27/2007	7/27/2017	4/27/2017	4.25000	102.08946	102.08946	102.08946	101.67100	101.18215	100.69868	100.25784	99.92050
7/30/2007	1/30/2019	5/1/2017	3.99000	108.07923	108.07923	107.21465	105.20035	103.33585	101.76444	100.63965	99.97979
7/31/2007	7/31/2017	5/1/2017	3.99000	102.00596	102.00596	102.00596	101.57501	101.07589	100.58948	100.16633	99.84436
7/31/2007	7/31/2017	5/1/2017	3.99000	102.00596	102.00596	102.00596	101.57501	101.07589	100.58948	100.16633	99.84436
7/31/2007	7/31/2017	5/1/2017	4.06000	102.04115	102.04115	102.04115	101.61012	101.11089	100.62312	100.19381	99.86524
8/2/2007	8/2/2017	5/2/2017	4.05000	102.05862	102.05862	102.05862	101.62087	101.11632	100.62369	100.19112	99.99499
8/9/2007	8/9/2017	2/9/2017	3.99000	102.10570	102.10570	102.10570	101.64445	101.12135	100.61220	100.16893	99.97603
8/16/2007	8/16/2017	2/16/2017	3.99000	102.18328	102.18328	102.18328	101.69846	101.15674	100.62989	100.17060	99.95749
8/17/2007	8/17/2017	2/17/2017	4.00000	102.19986	102.19986	102.19986	101.71166	101.16726	100.63767	100.17514	99.95532
9/4/2007	9/5/2017	3/6/2017	3.89000	102.34465	102.34465	102.34465	101.79202	101.19740	100.62714	100.16112	99.92200
9/10/2007	9/11/2017	3/10/2017	3.69000	102.28559	102.28559	102.28559	101.71232	101.10238	100.52539	100.08796	99.88544
9/11/2007	9/11/2017	3/13/2017	3.59000	102.22365	102.22365	102.22365	101.65055	101.04127	100.47063	100.05541	99.86554
9/13/2007	9/13/2017	3/13/2017	3.99000	102.49359	102.49359	102.49359	101.91279	101.29586	100.70148	100.20463	99.92881
9/27/2007	9/27/2017	3/27/2017	3.65000	102.42303	102.42303	102.42303	101.79394	101.14074	100.52713	100.07454	99.84197
10/11/2007	10/11/2017	4/11/2017	3.99000	102.80391	102.80391	102.80391	102.12349	101.43164	100.77182	100.23457	99.89546
10/15/2007	10/16/2017	4/17/2017	3.99000	102.85932	102.85932	102.85932	102.16065	101.45561	100.78343	100.23481	99.88312
10/26/2007	10/26/2017	4/26/2017	3.39000	102.52348	102.52348	102.52348	101.78996	101.06534	100.41996	99.97862	99.69817
11/5/2007	11/6/2017	2/6/2017	4.39000	103.40205	103.40205	103.39642	102.62462	101.86191	101.12661	100.48546	100.07478
11/6/2007	11/6/2017	2/6/2017	3.48000	102.69681	102.69681	102.69118	101.92210	101.16922	100.49818	100.06558	99.97554
11/19/2007	11/20/2017	11/19/2012	4.29000	103.49138	103.49138	103.47260	102.66072	101.85917	101.07017	100.29342	99.52864
11/20/2007	11/20/2017	2/21/2017	3.74000	103.04374	103.04374	103.02497	102.21491	101.42013	100.68838	100.13654	99.92979
11/23/2007	11/24/2017	11/23/2011	3.99000	103.29154	103.29154	103.26902	102.44659	101.63524	100.83675	100.05083	99.27718
11/23/2007	11/24/2017	11/23/2011	3.99000	103.29154	103.29154	103.26902	102.44659	101.63524	100.83675	100.05083	99.27718
11/29/2007	11/29/2017	2/28/2017	2.95000	102.47451	102.47451	102.44732	101.61492	100.82304	100.19174	99.92837	99.84541
11/30/2007	11/30/2017	2/28/2017	3.19000	102.68471	102.68471	102.65657	101.82007	101.01310	100.33320	99.96584	99.86406
12/10/2007	12/11/2017	3/10/2017	3.45000	103.00895	103.00895	102.96675	102.09952	101.25906	100.52297	100.04702	99.85831
12/24/2007	12/26/2017	12/24/2012	3.99000	103.64619	103.64619	103.58479	102.67445	101.77848	100.89817	100.03312	99.18292
1/7/2008	1/8/2018	4/7/2017	2.59000	102.46026	102.46026	102.38075	101.44815	100.61467	100.06872	99.80469	99.61524
1/8/2008	1/8/2018	4/10/2017	2.57000	102.44126	102.44126	102.36175	101.42957	100.59858	100.05747	99.79118	99.59422
1/8/2008	1/8/2018	4/10/2017	2.64000	102.50776	102.50776	102.42824	101.49460	100.65312	100.08681	99.80628	99.60759
1/11/2008	1/11/2018	4/11/2017	2.72000	102.60643	102.60643	102.52246	101.57950	100.72091	100.12289	99.82134	99.61753
1/14/2008	1/16/2018	4/14/2017	3.24000	103.14976	103.14976	103.05832	102.09588	101.17900	100.42337	99.96585	99.71055
1/16/2008	1/16/2018	4/17/2017	2.38000	102.31365	102.31365	102.22233	101.27453	100.46152	99.97934	99.72631	99.51381
1/17/2008	1/17/2018	4/17/2017	2.25000	102.19351	102.19351	102.10075	101.15541	100.37121	99.93620	99.69793	99.48655
1/18/2008	1/18/2018	4/18/2017	2.29000	102.23887	102.23887	102.14462	101.19503	100.39890	99.94762	99.70271	99.48838
2/14/2008	2/14/2018	2/14/2012	3.19000	103.35810	103.35810	103.22807	102.17990	101.14849	100.13476	99.13825	98.15853
3/7/2008	3/7/2018	3/7/2017	3.55000	103.94416	103.94416	103.78586	102.67443	101.61239	100.70850	100.11704	99.88170
3/14/2008	3/14/2018	3/14/2017	2.40000	102.71305	102.71305	102.54365	101.44283	100.52499	100.01302	99.84232	99.72213
3/17/2008	3/19/2018	3/17/2017	3.30000	103.77638	103.77638	103.59796	102.45704	101.38316	100.51121	100.01321	99.81912
4/28/2008	4/30/2018	4/28/2017	2.15000	102.71107	102.71107	102.46374	101.26687	100.35667	99.89336	99.63023	99.38941
4/30/2008	4/30/2018	4/30/2017	3.74000	104.71624	104.71624	104.46654	103.20050	101.95406	100.72828	99.52270	98.33688

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
5/23/2008	5/23/2018	2/23/2017	3.27000	104.33241	104.33241	104.03994	102.72376	101.50643	100.54891	100.03014	99.89324
6/30/2008	7/2/2018	6/30/2011	3.69000	105.29888	105.29888	104.92995	103.48841	102.07216	100.68205	99.31740	97.97758
7/11/2008	7/11/2018	7/11/2012	3.75000	105.47879	105.47879	105.09104	103.62412	102.18339	100.76965	99.38222	98.02043
7/14/2008	7/16/2018	4/14/2017	2.50000	103.68713	103.68713	103.29286	101.88239	100.73644	100.06604	99.76652	99.55703
7/14/2008	7/16/2018	4/14/2017	3.25000	104.79338	104.79338	104.39629	102.93783	101.61211	100.59233	100.00732	99.71713
7/17/2008	7/17/2018	5/14/2017	3.75000	105.54129	105.54129	105.14104	103.65763	102.20101	100.77197	99.36979	97.99378
8/15/2008	8/15/2018	2/15/2017	3.83000	105.96802	105.96802	105.50616	103.95039	102.48638	101.24279	100.35764	99.96580
12/27/2011	12/27/2021	12/29/2014	3.55000	117.65991	117.00308	111.89620	106.93979	102.23510	97.76905	93.52828	89.50028
5/15/2012	5/15/2017	11/17/2014	1.95000	100.56326	100.56326	100.56326	100.35997	100.07060	99.78292	99.49690	99.21254
6/20/2012	6/20/2017	6/22/2015	1.63000	100.63379	100.63379	100.63379	100.33252	99.94597	99.56240	99.18178	98.80407
7/16/2012	7/17/2017	7/16/2014	1.72000	100.79777	100.79777	100.79777	100.41369	99.95479	99.50009	99.04953	98.60305
7/18/2012	7/18/2018	7/20/2015	2.72000	104.02674	104.02674	103.62589	102.15102	100.70331	99.28309	97.88965	96.52231
7/19/2012	7/19/2017	7/21/2014	1.69000	100.79324	100.79324	100.79324	100.40285	99.93872	99.47887	99.02327	98.57184
10/1/2012	10/1/2019	4/1/2015	2.25000	106.08056	106.08056	104.47917	101.81032	99.22226	96.71291	94.27951	91.91936
10/5/2012	10/5/2017	10/6/2014	1.63000	101.11819	101.11819	101.11819	100.46487	99.79384	99.13175	98.47842	97.83368
3/8/2013	3/8/2018	3/9/2015	1.78000	101.98244	101.98244	101.82304	100.71756	99.62845	98.55608	97.50010	96.46016
5/7/2014	5/7/2018	5/7/2015	1.76000	102.25346	102.25346	101.99202	100.72289	99.47453	98.24715	97.04028	95.85344
10/16/2014	10/16/2018	10/17/2016	2.48000	104.29134	104.29134	103.69536	101.97701	100.29426	98.64714	97.03469	95.45601
10/24/2014	10/24/2018	10/26/2015	1.74000	103.04939	103.04939	102.43687	100.70826	99.01618	97.36030	95.73966	94.15332
10/24/2014	10/24/2018	10/26/2015	1.74000	103.04939	103.04939	102.43687	100.70826	99.01618	97.36030	95.73966	94.15332
2/20/2015	2/20/2019	2/22/2016	1.79000	103.72864	103.72864	102.82298	100.76892	98.76536	96.81139	94.90552	93.04631
3/26/2015	3/26/2019	3/29/2016	1.61000	103.50567	103.50567	102.50886	100.36651	98.27862	96.24409	94.26128	92.32862
3/26/2015	3/26/2020	3/29/2016	1.59000	105.07836	105.07836	102.81520	99.70498	96.70397	93.80827	91.01368	88.31618
6/29/2015	7/1/2019	6/29/2017	0.71706	105.61286	105.61286	104.31672	102.16361	100.49662	99.76737	99.51395	99.34944
7/30/2015	7/30/2019	8/1/2016	1.80000	104.54936	104.54936	103.16713	100.68281	98.27033	95.92777	93.65269	91.44277
8/14/2015	8/14/2025	8/14/2020	1.85000	116.01561	111.51123	106.13365	101.55234	97.59582	94.04475	90.76889	87.69295
8/19/2015	8/19/2025	8/21/2017	0.99000	108.58328	105.70134	102.52104	100.52332	99.57307	98.97036	98.42732	97.89513
8/25/2015	8/25/2020	8/25/2017	0.95000	103.43493	103.43493	101.69215	100.24366	99.49323	98.92026	98.37145	97.82982
8/26/2015	8/26/2025	8/26/2020	1.75000	115.20811	110.82328	105.53828	101.02265	97.10321	93.56919	90.29716	87.21752
9/14/2015	9/14/2020	9/14/2017	1.05000	103.85491	103.85491	101.96279	100.37159	99.50561	98.86387	98.26198	97.67029
9/15/2015	9/16/2019	9/15/2016	1.75000	104.65627	104.65627	103.11259	100.50229	97.97042	95.51478	93.13272	90.82166
9/18/2015	9/18/2020	9/18/2017	1.09000	104.01391	104.01391	102.06683	100.42284	99.52398	98.86649	98.25364	97.65181
9/29/2015	9/30/2019	9/29/2016	1.61000	104.34632	104.34632	102.75704	100.11391	97.55118	95.06651	92.65715	90.32044
10/2/2015	10/2/2020	10/2/2017	0.89000	103.31185	103.31185	101.58010	100.15631	99.32487	98.65039	98.00428	97.36845
10/2/2015	10/2/2025	10/2/2020	1.69000	114.86028	110.46363	105.19370	100.64823	96.67692	93.08067	89.74347	86.60001
11/6/2015	11/6/2020	11/6/2017	1.05000	104.00946	104.00946	102.00332	100.34328	99.34277	98.55799	97.82196	97.10173
11/6/2015	11/7/2022	11/6/2018	1.40000	108.18850	107.05224	103.59072	100.81560	98.65245	96.79726	95.08797	93.45475
12/4/2015	12/4/2025	12/4/2018	1.36000	112.19610	108.26366	104.12219	100.97653	98.59390	96.60037	94.79433	93.08471
12/8/2015	12/8/2020	3/8/2017	1.38000	105.39251	105.39251	102.95578	100.95287	100.05324	99.86345	99.75920	99.65518
12/11/2015	12/12/2022	12/11/2017	0.46306	109.77726	108.28567	104.14878	101.68937	100.19975	99.35747	98.83123	98.43134
12/15/2015	12/16/2019	3/15/2017	1.39000	104.04957	104.04957	102.56047	100.81016	100.02493	99.84172	99.71888	99.59637
12/15/2015	12/15/2022	12/15/2017	0.46344	109.76654	108.26273	104.12494	101.68682	100.30634	99.67291	99.39613	99.24585
12/18/2015	12/18/2020	12/18/2017	0.74317	106.72603	106.72603	103.77817	101.74448	100.49220	99.87421	99.58629	99.42248
12/24/2015	12/24/2020	12/26/2017	1.25000	104.93997	104.93997	102.57754	100.62851	99.39372	98.44585	97.57901	96.73857
12/24/2015	12/24/2025	12/24/2020	1.99000	117.95732	112.77157	106.92936	101.95000	97.62210	93.73245	90.15079	86.79938
1/12/2016	1/13/2020	4/12/2017	1.87000	105.59366	105.59366	103.85120	101.68891	100.38288	99.86907	99.64319	99.44548
1/19/2016	1/19/2021	1/19/2018	1.15000	104.62774	104.62774	102.31318	100.43588	99.20276	98.21209	97.29150	96.39715
1/19/2016	1/20/2026	1/22/2019	1.35000	112.28262	108.23876	104.02600	100.68085	98.01027	95.69540	93.56770	91.54866
1/22/2016	1/22/2020	4/24/2017	1.46000	104.40357	104.40357	102.78315	100.93154	100.03924	99.72132	99.48853	99.25917
1/29/2016	1/29/2021	5/1/2017	1.42000	105.75392	105.75392	103.11540	101.02407	100.05079	99.69034	99.43557	99.18748
2/2/2016	2/2/2021	2/2/2018	0.28428	106.15126	106.15126	103.11312	101.27152	100.21717	99.74898	99.58622	99.54534
2/17/2016	2/17/2021	2/17/2017	0.30622	103.54418	103.54418	101.55816	100.21190	99.93282	99.88236	99.83196	99.78163
2/26/2016	2/26/2020	2/27/2017	0.33706	103.82311	103.82311	102.22854	100.55465	99.90613	99.81555	99.73557	99.65573
2/26/2016	2/26/2021	2/26/2018	0.89000	103.67516	103.67516	101.62137	99.94175	98.72951	97.65988	96.63134	95.62248
2/26/2016	2/26/2026	2/26/2021	1.49000	113.70972	109.25424	103.84824	99.15294	94.97330	91.14201	87.56483	84.18865
3/8/2016	3/8/2023	3/8/2018	0.99000	106.12268	105.01842	102.22897	100.21612	98.84620	97.70945	96.64391	95.60612
3/18/2016	3/18/2020	3/20/2017	0.39317	104.97803	104.97803	103.13575	101.08973	100.00314	99.69940	99.56045	99.42489
4/5/2016	4/5/2021	4/12/2017	0.99000	104.19268	104.19268	100.89845	99.79790	98.64083	97.50226	96.38178	95.27900
4/8/2016	4/8/2020	4/10/2017	0.40928	103.78733	103.78733	102.11996	100.46021	99.79855	99.56893	99.37644	99.18505
4/12/2016	4/12/2021	4/12/2017	0.41789	104.05851	104.05851	101.79115	100.26405	99.76534	99.55537	99.35781	99.16104
4/28/2016	4/28/2020	4/28/2017	0.43900	104.39793	104.39793	102.54545	100.65526	99.77871	99.46133	99.21874	98.97903

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
4/28/2016	4/28/2021	4/28/2017	0.43900	105.38083	105.38083	102.62522	100.62598	99.76700	99.46072	99.21874	98.97903
4/28/2016	4/28/2021	4/30/2018	0.43900	106.36949	106.36949	102.68396	100.62228	99.54702	99.02425	98.70889	98.45811
5/2/2016	5/2/2023	5/4/2018	0.28428	107.81579	106.05708	102.40469	100.67123	99.83602	99.50288	99.38762	99.35301
5/2/2016	5/4/2026	5/2/2017	0.28428	107.98204	104.85056	101.86148	100.28525	99.91784	99.88593	99.87868	99.87230
5/5/2016	5/5/2021	5/7/2018	0.89000	103.84322	103.84322	101.64649	99.82552	98.42329	97.16534	95.95781	94.77648
5/5/2016	5/5/2026	5/5/2021	1.49000	113.99111	109.34367	103.76507	98.91753	94.58640	90.61154	86.90172	83.40452
5/6/2016	5/6/2026	5/8/2017	0.28094	106.70194	103.97997	101.38265	100.11432	99.88083	99.84838	99.82555	99.80326
5/10/2016	5/11/2026	5/10/2017	0.49000	104.60774	102.72196	100.92623	99.99701	99.66988	99.39544	99.12320	98.85246
5/12/2016	5/12/2026	5/12/2017	0.49000	104.60910	102.72225	100.92383	99.99354	99.66225	99.38259	99.10516	98.82929
5/13/2016	5/13/2026	5/15/2017	0.30206	107.07338	104.21850	101.49347	100.13907	99.85836	99.80448	99.76286	99.72183
5/17/2016	5/17/2021	5/17/2018	0.30622	105.71132	105.71132	102.06112	100.36448	99.61170	99.33464	99.22950	99.17533
5/20/2016	5/20/2026	5/22/2017	0.59000	105.56330	103.33037	101.19766	100.05257	99.65616	99.34904	99.04564	98.74410
6/3/2016	6/3/2026	6/5/2017	0.29167	107.61884	104.56509	101.65899	100.18247	99.78696	99.67144	99.58110	99.49217
6/6/2016	6/8/2020	6/6/2017	0.29639	104.80316	104.80316	102.72710	100.85826	99.95848	99.68300	99.57066	99.47774
6/6/2016	6/6/2031	6/6/2017	0.59000	107.05138	103.87314	101.39742	100.05829	99.51131	99.09851	98.69695	98.29915
6/8/2016	6/8/2026	6/8/2017	0.59000	105.59442	103.33879	101.21131	100.04881	99.59469	99.24052	98.89260	98.54716
6/14/2016	6/16/2031	6/14/2017	0.49000	105.81853	103.12156	101.04625	99.97402	99.53217	99.16355	98.79984	98.43882
6/16/2016	6/16/2020	6/16/2017	0.32039	104.59179	104.59179	101.99979	100.13518	99.72899	99.59494	99.47482	99.35563
6/16/2016	6/16/2026	6/18/2018	0.69000	106.55835	103.95004	101.44603	99.47388	97.95621	96.59195	95.28319	94.00464
6/16/2016	6/16/2031	6/16/2021	1.21000	114.95229	109.00747	102.83426	97.71120	93.22473	89.15196	85.37313	81.82298
6/24/2016	6/24/2026	6/26/2017	0.59000	105.62063	103.31891	101.19296	100.01709	99.52279	99.12070	98.72515	98.33279
6/27/2016	6/27/2031	6/27/2018	0.69000	108.30897	104.60635	101.67853	99.52390	97.92886	96.52644	95.19188	93.89117
6/27/2016	6/27/2031	6/27/2019	0.91000	111.09612	106.38217	102.40247	99.16102	96.49999	94.12067	91.89005	89.75303
6/30/2016	6/30/2020	6/30/2017	0.39817	104.44628	104.44628	101.80931	100.07350	99.69133	99.52288	99.36456	99.20725
6/30/2016	6/30/2021	6/30/2017	0.59000	102.63914	102.58010	100.96007	99.97595	99.50516	99.09409	98.68800	98.28525
7/8/2016	7/8/2026	7/10/2017	0.45000	104.30387	102.48402	100.82426	99.88888	99.40182	98.96515	98.53388	98.10639
7/14/2016	7/14/2021	7/14/2017	0.37317	104.41925	104.32080	101.73318	100.22530	99.65477	99.40946	99.20883	99.01241
7/22/2016	7/22/2026	7/24/2017	0.55000	105.28218	103.08664	101.08486	99.94516	99.38886	98.91378	98.44693	97.98457
7/22/2016	7/22/2026	7/24/2017	0.55000	105.28218	103.08664	101.08486	99.94516	99.38886	98.91378	98.44693	97.98457
7/28/2016	7/28/2026	7/30/2018	0.33900	110.06948	105.51811	101.84547	100.12237	99.23152	98.75715	98.44748	98.19663
8/1/2016	8/1/2031	8/1/2017	0.49000	105.85993	103.14591	101.07150	99.91233	99.32650	98.82919	98.34216	97.86011
8/11/2016	8/11/2026	8/13/2018	0.81000	107.81070	104.75266	101.86265	99.61270	97.88254	96.35167	94.89955	93.48880
8/12/2016	8/12/2021	8/14/2017	0.10206	104.26979	104.13562	101.45834	100.10851	99.67747	99.58131	99.54142	99.50782
8/19/2016	8/19/2021	8/21/2017	0.11122	104.43713	104.29423	101.54325	100.13394	99.65320	99.52805	99.46557	99.41035
9/2/2016	9/2/2026	9/5/2017	0.69000	106.67343	104.00872	101.54519	100.06476	99.30024	98.69962	98.12333	97.55504
9/9/2016	9/9/2026	9/10/2018	0.80000	107.74518	104.70713	101.81679	99.52166	97.72517	96.12421	94.60394	93.12773
9/9/2016	9/9/2031	9/11/2017	0.39000	104.63389	102.43502	100.75597	99.72740	99.07306	98.47328	97.88355	97.30097
9/12/2016	9/12/2031	9/12/2017	0.39000	104.63313	102.42716	100.75335	99.72449	99.06798	98.46562	97.87335	97.28828
9/15/2016	9/15/2026	9/16/2019	0.99000	109.59905	105.96571	102.24987	99.00009	96.20991	93.66235	91.25751	88.95153
9/15/2016	9/15/2026	9/16/2019	0.99000	109.59905	105.96571	102.24987	99.00009	96.20991	93.66235	91.25751	88.95153
9/16/2016	9/16/2021	9/18/2017	0.12039	104.93691	104.73173	101.79294	100.21406	99.56430	99.33360	99.20042	99.08245
9/22/2016	9/22/2031	9/22/2017	0.39000	104.63517	102.41798	100.74257	99.69828	99.01750	98.38920	97.77147	97.16156
9/22/2016	9/22/2031	9/24/2018	0.65000	107.87840	104.33117	101.46702	99.18644	97.38644	95.76503	94.21692	92.71102
9/26/2016	9/26/2031	9/26/2017	0.42000	105.00499	102.62402	100.82403	99.71843	99.01788	98.37834	97.75032	97.13042
10/3/2016	10/5/2026	10/3/2017	0.59000	105.72937	103.36200	101.22931	99.89118	99.10815	98.44101	97.79430	97.15691
10/7/2016	10/7/2026	10/10/2017	0.69000	106.70764	103.99215	101.54222	100.01263	99.15623	98.46214	97.79704	97.14269
10/21/2016	10/21/2031	10/23/2017	0.55000	106.64888	103.58172	101.24747	99.82538	98.98871	98.27139	97.57602	96.89132
1/13/2017	1/13/2022	1/16/2018	0.00178	107.74279	107.17543	103.40104	101.09473	99.71398	99.01073	98.64565	98.40884
1/13/2017	1/13/2027	1/14/2019	1.31000	112.97394	108.31423	104.06025	100.81587	98.33770	96.24821	94.34860	92.54940
1/20/2017	1/22/2024	1/22/2019	0.00011	111.42064	108.20303	103.78599	101.26361	99.61689	98.60535	97.98140	97.57365
1/20/2017	1/20/2032	1/22/2018	0.93000	111.62251	106.67077	102.85895	100.44812	99.03477	97.99205	97.05582	96.15397
1/24/2017	1/24/2024	1/24/2019	0.00344	112.30209	108.97459	104.38693	101.68877	99.88264	98.74846	98.03982	97.57741
1/30/2017	2/1/2027	1/30/2020	0.00900	119.22843	111.06319	105.61694	102.35401	100.12018	98.63887	97.65732	96.99306