

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.

As of: **5/31/2017** **HLB Option Sensitivity Analysis for HLB-Option and Knockout Advances**

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
6/7/2007	6/7/2017	6/7/2017	4.82000	100.09372	100.09372	100.09372	100.07439	100.05489	100.03542	100.01596	99.99653
6/8/2007	6/8/2017	6/8/2017	4.49000	100.09977	100.09977	100.09977	100.07769	100.05542	100.03317	100.01094	99.98874
6/18/2007	6/19/2017	6/19/2017	4.50000	100.23749	100.23749	100.23749	100.18505	100.13217	100.07937	100.02664	99.97398
6/19/2007	6/19/2017	6/19/2017	4.65000	100.24540	100.24540	100.24540	100.19296	100.14008	100.08727	100.03453	99.98186
6/22/2007	6/22/2017	6/22/2017	4.50000	100.27498	100.27498	100.27498	100.21427	100.15305	100.09193	100.03089	99.96993
6/28/2007	6/28/2017	6/28/2017	4.50000	100.34998	100.34998	100.34998	100.27271	100.19482	100.11706	100.03941	99.96190
7/13/2007	7/13/2017	7/13/2017	4.29000	100.51239	100.51239	100.50909	100.39088	100.27250	100.15441	100.03662	99.91912
7/20/2007	7/20/2017	7/20/2017	4.29000	100.59580	100.59580	100.59073	100.45344	100.31625	100.17945	100.04304	99.90701
7/27/2007	7/27/2017	7/27/2017	4.25000	100.67288	100.67288	100.66604	100.50967	100.35369	100.19821	100.04321	99.88870
7/30/2007	1/30/2019	7/31/2017	3.99000	106.74932	106.74932	105.72128	104.04339	102.45815	101.11200	100.22501	99.85372
7/31/2007	7/31/2017	7/31/2017	3.99000	100.67604	100.67604	100.66819	100.50098	100.33432	100.16822	100.00266	99.83766
7/31/2007	7/31/2017	7/31/2017	3.99000	100.67604	100.67604	100.66819	100.50098	100.33432	100.16822	100.00266	99.83766
7/31/2007	7/31/2017	7/31/2017	4.06000	100.68790	100.68790	100.68005	100.51283	100.34615	100.18003	100.01447	99.84944
8/2/2007	8/2/2017	8/2/2017	4.05000	100.70871	100.70871	100.69961	100.52699	100.35495	100.18351	100.01266	99.84239
8/9/2007	8/9/2017	8/9/2017	3.99000	100.77579	100.77579	100.76236	100.57083	100.38004	100.18998	100.00066	99.81207
8/16/2007	8/16/2017	8/16/2017	3.99000	100.85336	100.85336	100.83560	100.62516	100.41561	100.20695	99.99918	99.79228
8/17/2007	8/17/2017	8/17/2017	4.00000	100.86661	100.86661	100.84823	100.63509	100.42286	100.21154	100.00112	99.79161
9/4/2007	9/5/2017	6/5/2017	3.89000	101.04807	101.04807	101.01523	100.75037	100.48691	100.22484	100.01413	99.98465
9/10/2007	9/11/2017	6/12/2017	3.69000	101.05568	101.05568	101.01589	100.73440	100.45449	100.17616	99.98989	99.95663
9/11/2007	9/11/2017	6/12/2017	3.59000	101.02707	101.02707	100.98728	100.70585	100.42599	100.14771	99.98657	99.95331
9/13/2007	9/13/2017	6/13/2017	3.99000	101.16368	101.16368	101.12155	100.83432	100.54874	100.26480	100.02809	99.96378
9/27/2007	9/27/2017	6/27/2017	3.65000	101.20645	101.20645	101.14811	100.82207	100.49813	100.17629	99.97446	99.89975
10/11/2007	10/11/2017	7/11/2017	3.99000	101.47399	101.47399	101.39403	101.02972	100.66804	100.31021	100.02844	99.88863
10/15/2007	10/16/2017	7/17/2017	3.99000	101.52941	101.52941	101.44121	101.06342	100.68844	100.31798	100.02832	99.87341
10/26/2007	10/26/2017	7/26/2017	3.39000	101.39357	101.39357	101.28900	100.88484	100.48391	100.12213	99.91087	99.75756
11/5/2007	11/6/2017	8/7/2017	4.39000	101.93881	101.93881	101.81609	101.38067	100.94899	100.52357	100.15351	99.90158
11/6/2007	11/6/2017	8/7/2017	3.48000	101.53689	101.53689	101.41436	100.97998	100.54965	100.16522	99.91135	99.72216
11/19/2007	11/20/2017	11/19/2012	4.29000	102.06146	102.06146	101.91603	101.44166	100.97172	100.50615	100.04489	99.58788
11/20/2007	11/20/2017	8/21/2017	3.74000	101.79716	101.79716	101.65187	101.17824	100.70927	100.27209	99.95536	99.72207
11/23/2007	11/24/2017	11/23/2011	3.99000	101.96163	101.96163	101.80979	101.32468	100.84421	100.36830	99.89689	99.42992
11/23/2007	11/24/2017	11/23/2011	3.99000	101.96163	101.96163	101.80979	101.32468	100.84421	100.36830	99.89689	99.42992
11/29/2007	11/29/2017	8/29/2017	2.95000	101.49126	101.49126	101.33163	100.83413	100.35461	99.99485	99.73859	99.49794
11/30/2007	11/30/2017	8/30/2017	3.19000	101.62146	101.62146	101.46013	100.95951	100.46924	100.07079	99.79695	99.55249
12/10/2007	12/11/2017	6/12/2017	3.45000	101.85903	101.85903	101.67997	101.14939	100.62849	100.17334	99.98191	99.94866
12/24/2007	12/26/2017	12/24/2012	3.99000	102.31627	102.31627	102.11289	101.54098	100.97547	100.41628	99.86328	99.31639
1/7/2008	1/8/2018	7/7/2017	2.59000	101.59701	101.59701	101.37364	100.77150	100.22884	99.96396	99.85716	99.75574
1/8/2008	1/8/2018	7/10/2017	2.57000	101.58468	101.58468	101.36132	100.75937	100.22341	99.95773	99.84362	99.73428
1/8/2008	1/8/2018	7/10/2017	2.64000	101.62785	101.62785	101.40445	100.80191	100.25414	99.96851	99.85137	99.74202
1/11/2008	1/11/2018	7/11/2017	2.72000	101.69985	101.69985	101.47166	100.86055	100.29823	99.98152	99.85676	99.74475
1/14/2008	1/16/2018	7/14/2017	3.24000	102.06984	102.06984	101.83344	101.20669	100.59943	100.11850	99.91160	99.78980
1/16/2008	1/16/2018	7/17/2017	2.38000	101.52040	101.52040	101.28451	100.66397	100.14490	99.92146	99.79207	99.66427
1/17/2008	1/17/2018	7/17/2017	2.25000	101.44359	101.44359	101.20621	100.58592	100.09566	99.90348	99.77517	99.64738
1/18/2008	1/18/2018	7/18/2017	2.29000	101.47562	101.47562	101.23664	100.61268	100.11025	99.90707	99.77576	99.64533
2/14/2008	2/14/2018	2/14/2012	3.19000	102.29485	102.29485	102.01612	101.30762	100.60898	99.91997	99.24042	98.57011
3/7/2008	3/7/2018	6/7/2017	3.55000	102.76092	102.76092	102.45137	101.68162	100.93463	100.30412	99.99135	99.97194
3/14/2008	3/14/2018	6/14/2017	2.40000	101.91313	101.91313	101.59297	100.81709	100.18500	99.97700	99.93820	99.89944
3/17/2008	3/19/2018	6/19/2017	3.30000	102.67646	102.67646	102.34682	101.54604	100.77943	100.16960	99.96352	99.91092
4/28/2008	4/30/2018	7/28/2017	2.15000	101.99449	101.99449	101.59430	100.71066	100.08968	99.86488	99.70743	99.55071
4/30/2008	4/30/2018	7/30/2017	3.74000	103.46966	103.46966	103.06677	102.14850	101.24661	100.36065	99.49022	98.63490
5/23/2008	5/23/2018	8/23/2017	3.27000	103.24250	103.24250	102.79401	101.81823	100.89731	100.20333	99.84233	99.60617
6/30/2008	7/2/2018	6/30/2011	3.69000	104.06897	104.06897	103.54349	102.44727	101.36779	100.30472	99.25772	98.22646
7/11/2008	7/11/2018	7/11/2012	3.75000	104.22888	104.22888	103.68357	102.56234	101.45844	100.37153	99.30123	98.24721
7/14/2008	7/16/2018	7/14/2017	2.50000	102.85388	102.85388	102.30139	101.20232	100.32586	99.95041	99.81975	99.69985
7/14/2008	7/16/2018	7/14/2017	3.25000	103.71013	103.71013	103.15523	102.02845	100.98461	100.22326	99.91853	99.79102
7/17/2008	7/17/2018	5/14/2017	3.75000	104.29138	104.29138	103.73294	102.59530	101.47540	100.37286	99.28730	98.21839
8/15/2008	8/15/2018	8/15/2017	3.83000	104.69144	104.69144	104.06825	102.85249	101.68679	100.69257	100.07159	99.77002
12/27/2011	12/27/2021	12/29/2014	3.55000	116.47668	116.47668	111.92222	107.28950	102.87874	98.67819	94.67675	90.86399
6/20/2012	6/20/2021	6/22/2015	1.63000	100.09054	100.09054	100.09054	100.03548	99.97996	99.92452	99.86916	99.81387
7/16/2012	7/17/2017	7/16/2014	1.72000	100.22452	100.22452	100.22023	100.09149	99.96274	99.83433	99.70628	99.57856
7/18/2012	7/18/2018	7/20/2015	2.72000	103.12016	103.12016	102.56229	101.42901	100.31343	99.21517	98.13388	97.06919
7/19/2012	7/19/2017	7/21/2014	1.69000	100.14080	100.14080	100.13600	100.00196	99.86798	99.73438	99.60115	99.46830

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
10/1/2012	10/1/2019	4/1/2015	2.25000	105.33065	105.33065	103.66044	101.33547	99.07403	96.87404	94.73351	92.65053
10/5/2012	10/5/2017	10/6/2014	1.63000	100.57494	100.57494	100.50509	100.15877	99.81483	99.47326	99.13404	98.79713
3/8/2013	3/8/2018	3/9/2015	1.78000	101.38919	101.38919	101.07976	100.31299	99.55783	98.81401	98.08127	97.35937
5/7/2014	5/7/2018	5/7/2015	1.76000	101.66688	101.66688	101.25312	100.32551	99.41483	98.52062	97.64243	96.77985
10/16/2014	10/16/2018	10/17/2016	2.48000	103.46476	103.46476	102.70557	101.32950	99.97826	98.65121	97.34778	96.06739
10/24/2014	10/24/2018	10/26/2015	1.74000	102.46948	102.46948	101.69468	100.30489	98.94052	97.60095	96.28556	94.99375
10/24/2014	10/24/2018	10/26/2015	1.74000	102.46948	102.46948	101.69468	100.30489	98.94052	97.60095	96.28556	94.99375
2/20/2015	2/20/2019	2/22/2016	1.79000	103.13206	103.13206	102.07146	100.35715	98.67956	97.03772	95.43067	93.85749
3/26/2015	3/26/2019	3/29/2016	1.61000	102.96909	102.96909	101.82419	100.02079	98.25771	96.53383	94.84806	93.19934
3/26/2015	3/26/2020	3/29/2016	1.59000	104.54845	104.54845	102.35421	99.58001	96.89462	94.29473	91.77721	89.33903
6/29/2015	7/1/2019	6/29/2017	0.87189	105.64103	105.64103	104.22720	102.13868	100.28596	99.82974	99.74959	99.66957
7/30/2015	7/30/2019	8/1/2016	1.80000	103.94945	103.94945	102.46599	100.32192	98.23299	96.19750	94.21383	92.28038
8/14/2015	8/14/2025	8/14/2020	1.85000	115.39904	112.21601	106.44118	101.77957	97.92948	94.58829	91.56147	88.73757
8/19/2015	8/19/2025	8/21/2017	0.99000	108.25337	106.18995	102.32447	100.29669	99.76742	99.53906	99.31918	99.10029
8/25/2015	8/25/2020	8/25/2017	0.95000	103.11835	103.11835	101.23120	100.05520	99.73803	99.50619	99.27589	99.04666
8/26/2015	8/26/2025	8/26/2020	1.75000	114.62487	111.51362	105.84743	101.27281	97.47588	94.15921	91.13805	88.30898
9/14/2015	9/14/2020	9/14/2017	1.05000	103.50500	103.50500	101.48886	100.13339	99.69443	99.40585	99.12245	98.84068
9/15/2015	9/16/2019	9/15/2016	1.75000	104.07303	104.07303	102.45355	100.18308	97.97380	95.82375	93.73103	91.69382
9/18/2015	9/18/2020	9/18/2017	1.09000	103.65066	103.65066	101.58678	100.16467	99.69290	99.39228	99.09818	98.80584
9/29/2015	9/30/2019	9/29/2016	1.61000	103.80974	103.80974	102.15286	99.84844	97.60703	95.42660	93.30515	91.24078
10/2/2015	10/2/2020	10/2/2017	0.89000	103.01526	103.01526	101.14474	99.99870	99.57084	99.23514	98.90413	98.57533
10/2/2015	10/2/2025	10/2/2020	1.69000	114.29704	111.14969	105.53107	100.95035	97.11388	93.73819	90.65033	87.75431
11/6/2015	11/6/2020	11/6/2017	1.05000	103.65954	103.65954	101.54200	100.10194	99.49298	99.05816	98.63732	98.22029
11/6/2015	11/7/2022	11/6/2018	1.40000	107.72192	107.41076	103.42303	100.59853	98.64824	97.10752	95.71991	94.39106
12/4/2015	12/4/2025	12/4/2018	1.36000	111.74286	108.88119	104.07294	100.79941	98.59580	96.90990	95.42851	94.02686
12/8/2015	12/8/2020	6/8/2017	1.38000	104.93260	104.93260	102.45887	100.56025	99.98642	99.96423	99.94207	99.91992
12/11/2015	12/12/2022	12/11/2017	0.62956	109.87124	109.42035	104.88048	101.88629	100.20848	99.44758	99.07355	98.80638
12/15/2015	12/16/2019	6/15/2017	1.39000	103.58632	103.58632	101.94199	100.40867	99.97498	99.93340	99.89186	99.85038
12/15/2015	12/15/2022	12/15/2017	0.63122	109.86457	109.40492	104.86220	101.87223	100.28323	99.74445	99.62103	99.58229
12/18/2015	12/18/2020	12/18/2017	0.90178	106.74001	106.74001	103.97867	101.69334	100.35658	99.85538	99.72332	99.67300
12/24/2015	12/24/2020	12/26/2017	1.25000	104.52339	104.52339	102.10418	100.30754	99.43265	98.84412	98.29437	97.75245
12/24/2015	12/24/2025	12/24/2020	1.99000	117.29409	113.54245	107.37957	102.33211	98.10598	94.41448	91.06932	87.95906
1/12/2016	1/13/2020	7/12/2017	1.87000	104.97041	104.97041	103.11820	101.13776	100.10183	99.87017	99.75460	99.64006
1/19/2016	1/19/2021	1/19/2018	1.15000	104.24449	104.24449	101.86121	100.15758	99.28166	98.63941	98.03086	97.43140
1/19/2016	1/20/2026	1/22/2019	1.35000	111.83271	108.86825	104.00983	100.55963	98.05852	96.03019	94.21046	92.48701
1/22/2016	1/22/2020	7/24/2017	1.46000	103.91699	103.91699	102.15607	100.49975	99.92872	99.77082	99.62429	99.47820
1/29/2016	1/29/2021	7/31/2017	1.42000	105.28067	105.28067	102.63778	100.61378	99.91755	99.73440	99.56938	99.40492
2/2/2016	2/2/2021	2/2/2018	0.56956	106.55112	106.55112	103.69321	101.36017	99.97437	99.36108	99.09628	98.92356
2/26/2016	2/26/2021	2/26/2018	0.89000	103.37858	103.37858	101.21452	99.77314	98.92507	98.19889	97.49295	96.79763
2/26/2016	2/26/2026	2/26/2021	1.49000	113.21314	109.93494	104.34111	99.68105	95.66941	92.06318	88.72379	85.57649
3/8/2016	3/8/2023	3/8/2018	0.99000	105.79277	105.35643	101.97991	100.02877	98.98998	98.20967	97.47597	96.75635
3/18/2016	3/18/2020	6/19/2017	1.62000	104.59828	104.59828	102.64692	100.77016	99.99789	99.92777	99.87517	99.82264
4/5/2016	4/5/2021	7/12/2017	0.99000	103.86277	103.86277	100.44512	99.65576	98.83159	98.02098	97.22359	96.43912
4/28/2016	4/28/2020	7/28/2017	1.41000	104.16267	104.16267	102.19287	100.47087	99.91185	99.74583	99.58874	99.43215
4/28/2016	4/28/2021	7/28/2017	1.30000	105.15566	105.15566	102.40154	100.46938	99.89279	99.72818	99.57111	99.41454
4/28/2016	4/28/2021	4/30/2018	0.57178	106.50731	106.50731	103.25587	100.76844	99.55685	99.13243	98.94050	98.79190
5/2/2016	5/2/2023	5/4/2018	0.56956	108.21567	107.45792	103.22145	100.78099	99.60128	99.12419	98.89414	98.72401
5/5/2016	5/5/2021	5/7/2018	0.89000	103.54664	103.54664	101.26286	99.66892	98.62058	97.71212	96.83624	95.97749
5/5/2016	5/5/2026	5/5/2021	1.49000	113.49453	110.03995	104.34054	99.54340	95.38348	91.63091	88.15397	84.88026
5/17/2016	5/17/2021	5/17/2018	0.57944	106.12410	106.12410	102.86067	100.50063	99.40372	98.98138	98.74914	98.55171
6/3/2016	6/3/2026	6/5/2017	0.44278	107.76233	105.46157	101.87249	100.15879	99.98078	99.96692	99.95308	99.93925
6/6/2016	6/8/2020	6/6/2017	0.45000	104.94773	104.94773	102.79447	100.82129	100.00424	99.95771	99.94110	99.92450
6/6/2016	6/6/2031	6/6/2017	0.59000	107.90379	104.37093	101.19124	99.99434	99.88171	99.80323	99.72531	99.64776
6/8/2016	6/8/2026	6/8/2017	0.59000	105.39784	103.69140	100.96049	99.99110	99.96890	99.94672	99.92457	99.90244
6/14/2016	6/16/2031	6/14/2017	0.49000	106.56107	103.54414	100.82434	99.98054	99.94171	99.90292	99.86418	99.82549
6/16/2016	6/16/2020	6/16/2017	0.48733	104.73977	104.73977	102.28717	99.98141	99.93326	99.88894	99.84467	99.80047
6/16/2016	6/16/2026	6/18/2018	0.69000	106.32843	104.35664	101.22527	99.39859	98.21166	97.18533	96.19686	95.22698
6/16/2016	6/16/2031	6/16/2021	1.21000	116.38658	109.94059	103.59846	98.49221	94.16755	90.31242	86.76166	83.42886
6/24/2016	6/24/2026	6/26/2017	0.59000	105.42405	103.67987	100.93924	99.97108	99.89899	99.82701	99.75515	99.68339
6/27/2016	6/27/2031	6/27/2018	0.69000	109.28945	105.18984	101.52159	99.45118	98.17400	97.10754	96.08886	95.08971
6/27/2016	6/27/2031	6/27/2019	0.91000	112.29389	107.12596	102.42339	99.16086	96.71977	94.63432	92.70146	90.84682

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
6/30/2016	6/30/2020	6/30/2017	0.55222	104.58145	104.58145	102.08667	99.96350	99.88033	99.79730	99.71442	99.63166
6/30/2016	6/30/2021	6/30/2017	0.59000	102.44255	102.44255	100.62954	99.96664	99.88347	99.80044	99.71755	99.63480
7/8/2016	7/8/2026	7/10/2017	0.45000	104.15396	102.76890	100.57578	99.94134	99.82799	99.71838	99.60902	99.49991
7/14/2016	7/14/2021	7/14/2017	0.50844	104.56990	104.56990	101.86021	100.18900	99.81902	99.69733	99.57739	99.45774
7/22/2016	7/22/2026	7/24/2017	0.55000	105.09893	103.42816	100.82524	99.94285	99.78162	99.63481	99.48844	99.34252
7/22/2016	7/22/2026	7/24/2017	0.55000	105.09893	103.42816	100.82524	99.94285	99.78162	99.63481	99.48844	99.34252
7/28/2016	7/28/2026	7/30/2018	0.47178	110.24064	106.81223	102.32692	100.13455	99.19050	98.81150	98.60815	98.44680
8/1/2016	8/1/2031	8/1/2017	0.49000	106.58617	103.56960	100.84701	99.93256	99.73821	99.57021	99.40279	99.23593
8/11/2016	8/11/2026	8/13/2018	0.81000	107.55538	105.21915	101.67531	99.50727	98.07926	96.87865	95.73879	94.62373
8/12/2016	8/12/2021	8/14/2017	0.38094	104.74325	104.74325	101.92530	100.16479	99.66773	99.45788	99.25648	99.05591
8/19/2016	8/19/2021	8/21/2017	0.37839	104.91242	104.91242	102.02525	100.18431	99.63520	99.40489	99.18522	98.96654
9/2/2016	9/2/2026	9/5/2017	0.69000	106.47788	104.41496	101.30600	99.98655	99.62922	99.36732	99.10813	98.85030
9/9/2016	9/9/2026	9/10/2018	0.80000	107.52650	105.16976	101.63391	99.42377	97.92502	96.65162	95.44249	94.26093
9/9/2016	9/9/2031	9/11/2017	0.39000	105.25910	102.77818	100.53745	99.80561	99.51401	99.23740	98.96235	98.68885
9/12/2016	9/12/2031	9/12/2017	0.39000	105.26082	102.77376	100.53450	99.80258	99.50845	99.22915	98.95144	98.67529
9/15/2016	9/15/2026	9/16/2019	0.99000	109.33108	106.51462	102.23109	99.01412	96.44948	94.18823	92.07261	90.04117
9/15/2016	9/15/2026	9/16/2019	0.99000	109.33108	106.51462	102.23109	99.01412	96.44948	94.18823	92.07261	90.04117
9/16/2016	9/16/2021	9/18/2017	0.28733	105.15150	105.15150	102.10937	100.27832	99.75361	99.67734	99.63453	99.59271
9/22/2016	9/22/2031	9/22/2017	0.39000	105.26804	102.76476	100.51964	99.77349	99.45294	99.14671	98.84239	98.53995
9/22/2016	9/22/2031	9/24/2018	0.65000	108.83085	104.88943	101.31828	99.13770	97.64012	96.34325	95.10320	93.88988
9/26/2016	9/26/2031	9/26/2017	0.42000	105.68103	102.99772	100.59738	99.77629	99.44057	99.12353	98.80857	98.49560
10/3/2016	10/5/2026	10/3/2017	0.59000	105.59279	103.72896	100.98378	99.86084	99.46124	99.12461	98.79127	98.46017
10/7/2016	10/7/2026	10/10/2017	0.69000	106.54494	104.41038	101.30453	99.92832	99.46275	99.10599	98.75473	98.40598
10/21/2016	10/21/2031	10/23/2017	0.55000	107.46730	104.06190	101.02826	99.79761	99.33987	98.95146	98.56728	98.18609
1/13/2017	1/13/2022	1/16/2018	0.13511	108.01705	108.01705	104.15707	101.40039	99.84850	99.23197	99.01378	98.89013
1/13/2017	1/13/2027	1/14/2019	1.31000	112.78450	109.00938	104.04422	100.66680	98.36337	96.57469	94.99343	93.49639
1/20/2017	1/22/2024	1/22/2019	0.12622	111.69891	109.87092	104.85444	101.72117	99.73061	98.61656	98.03892	97.73349
1/20/2017	1/20/2032	1/22/2018	0.93000	112.86515	107.44923	102.78212	100.27261	99.16647	98.48182	97.86333	97.25702
1/24/2017	1/24/2024	1/24/2019	0.11317	112.58143	110.69462	105.53728	102.21982	100.03570	98.76278	98.08145	97.71716
1/30/2017	2/1/2027	1/30/2020	0.13956	119.94284	113.48185	107.02843	103.03731	100.35143	98.64422	97.60280	96.97775
2/17/2017	2/17/2022	2/20/2018	0.17944	108.65806	108.65806	104.62477	101.65987	99.86155	99.01906	98.64404	98.40850
3/7/2017	3/7/2022	3/7/2018	0.10167	108.57684	108.57684	104.51544	101.72950	100.09339	99.40444	99.20096	99.15612
3/7/2017	3/8/2027	3/7/2019	1.50000	114.86404	110.58548	105.13788	101.33013	98.67648	96.63432	94.86852	93.22392
3/20/2017	3/20/2024	3/20/2019	1.55000	110.69751	109.17211	104.48840	101.06548	98.58192	96.59461	94.83100	93.16819
3/20/2017	3/22/2032	3/20/2018	1.04000	114.53499	108.53704	103.42250	100.51378	99.07948	98.18443	97.40981	96.66092
3/27/2017	3/29/2021	3/27/2018	0.00289	106.78287	106.78287	103.74125	101.34907	99.83135	99.12188	98.86421	98.76438
3/31/2017	3/31/2022	4/2/2018	0.14678	108.38133	108.38133	104.27748	101.51028	99.89846	99.19337	98.93769	98.82832
4/10/2017	4/11/2022	4/10/2018	0.15761	107.98767	107.98767	103.91873	101.23427	99.71684	99.06810	98.82283	98.70057
4/13/2017	4/13/2022	4/13/2018	0.15844	107.82065	107.82065	103.77076	101.12330	99.64771	99.02421	98.78405	98.65721
4/13/2017	4/15/2024	4/15/2019	1.45000	110.11194	108.58354	104.03369	100.70229	98.24559	96.23590	94.42698	92.71163
4/13/2017	4/13/2032	4/13/2018	0.99000	113.85294	108.07790	103.15084	100.35672	98.92788	97.98362	97.15132	96.34634
4/28/2017	4/28/2021	4/30/2018	0.17178	106.44148	106.44148	103.37275	101.03301	99.59793	98.91541	98.61448	98.43836
4/28/2017	4/28/2022	4/29/2019	1.59000	107.91781	107.91781	103.92146	100.80170	98.40503	96.39344	94.56052	92.81477
4/28/2017	4/29/2024	4/29/2019	0.17178	111.96144	109.76629	104.70898	101.61369	99.61860	98.45776	97.81978	97.46205
5/8/2017	5/10/2027	5/8/2018	1.30000	113.10930	109.08638	104.10182	100.97468	99.23874	98.13253	97.21450	96.34594
5/8/2017	5/10/2032	5/8/2018	1.15000	116.18427	109.66989	104.13084	100.84206	99.08946	97.98904	97.07440	96.20706
5/19/2017	5/19/2022	5/21/2018	0.17839	107.79423	107.78978	103.65280	100.96142	99.42760	98.71287	98.36858	98.13923
5/22/2017	5/24/2021	5/22/2018	0.17172	106.02104	106.02104	102.94443	100.66698	99.31945	98.66758	98.33687	98.10643
5/22/2017	5/24/2027	5/22/2018	1.09000	111.03362	107.47759	103.01358	100.34125	98.85847	97.81854	96.89136	95.99609