

## **Parallel-Shift Sensitivity Analysis for HLB-Option and Knockout Advances**

The Federal Home Loan Bank of Boston (Bank) is providing estimated valuations of the specific HLB-Option and Knockout advances set forth below 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 HLB-Option or Knockout advance.

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 HLB-Option and Knockout advances.

The table depicts valuation estimates resulting from immediate parallel interest-rate movements of plus/minus 400 basis points in 100 basis point increments. 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 by the indicated basis point shocks. Please note that the valuation estimates are from the Federal Home Loan Bank of Boston's perspective. Since the advance is held by the member 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 advance, the Bank would be likely to exercise its option to cancel the advance as the value falls below 100. In the case of a Knockout advance, the Bank would automatically terminate the advance on any specified cancellation date if LIBOR is equal to or greater than a predetermined "strike rate" four London Business days prior to the scheduled cancellation date. In either case, the member's cost to prepay the advance increases as interest rates fall.

To identify your advance, locate the appropriate 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 the Money Desk at 1-800-357-3452.

As of: 9/30/2016 Parallel-Shift Sensitivity Analysis for HLB-Option and Knockout Advances

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
11/24/2006	11/25/2016	11/25/2016	4.190	100.652	100.652	100.652	100.597	100.444	100.291	100.139	99.987
12/1/2006	12/1/2016	12/1/2016	4.090	100.704	100.704	100.704	100.643	100.473	100.304	100.135	99.967
12/4/2006	12/5/2016	12/5/2016	4.080	100.748	100.748	100.748	100.681	100.500	100.321	100.141	99.963
12/5/2006	12/5/2016	12/5/2016	4.260	100.781	100.781	100.781	100.714	100.533	100.354	100.174	99.996
12/8/2006	12/8/2016	12/8/2016	3.990	100.765	100.765	100.765	100.694	100.505	100.317	100.130	99.944
12/12/2006	12/12/2016	12/12/2016	3.990	100.809	100.809	100.809	100.732	100.533	100.334	100.137	99.940
12/19/2006	12/19/2016	12/19/2016	4.190	100.931	100.931	100.931	100.845	100.626	100.409	100.193	99.977
12/28/2006	12/28/2016	12/28/2016	4.250	101.051	101.051	101.051	100.952	100.709	100.468	100.227	99.988
12/28/2006	12/28/2016	12/28/2016	4.400	101.088	101.088	101.088	100.989	100.746	100.505	100.264	100.025
1/12/2007	1/12/2017	10/12/2016	4.420	101.277	101.277	101.277	101.147	100.864	100.583	100.303	100.054
1/16/2007	1/17/2017	10/17/2016	4.790	101.450	101.450	101.450	101.309	101.013	100.718	100.424	100.133
2/2/2007	2/2/2017	11/20/2016	4.690	101.628	101.628	101.628	101.451	101.111	100.773	100.437	100.103
2/20/2007	2/21/2017	11/20/2016	4.850	101.940	101.940	101.940	101.709	101.312	100.918	100.527	100.140
2/20/2007	2/21/2017	11/21/2016	4.390	101.756	101.756	101.756	101.526	101.129	100.735	100.348	100.048
2/23/2007	2/23/2017	11/23/2016	4.250	101.724	101.724	101.724	101.488	101.085	100.686	100.300	100.017
2/23/2007	2/23/2017	11/23/2016	4.350	101.764	101.764	101.764	101.528	101.126	100.726	100.333	100.039
3/16/2007	3/16/2017	12/16/2016	4.090	101.897	101.897	101.897	101.601	101.141	100.686	100.271	99.971
3/23/2007	3/23/2017	12/23/2016	4.290	102.073	102.073	102.073	101.756	101.277	100.803	100.360	100.021
4/9/2007	4/10/2017	10/11/2016	4.150	102.213	102.213	102.213	101.844	101.317	100.799	100.330	100.028
4/12/2007	4/12/2017	10/12/2016	4.250	102.290	102.290	102.290	101.916	101.382	100.858	100.376	100.047
4/13/2007	4/13/2017	10/13/2016	4.450	102.410	102.410	102.410	102.033	101.496	100.967	100.470	100.090
5/18/2007	5/18/2017	11/18/2016	4.190	102.677	102.677	102.677	102.199	101.567	100.950	100.385	100.026
5/22/2007	5/22/2017	11/22/2016	4.750	103.087	103.087	103.087	102.597	101.953	101.320	100.710	100.208
5/29/2007	5/30/2017	11/29/2016	4.250	102.857	102.857	102.857	102.344	101.680	101.031	100.431	100.037
6/7/2007	6/7/2017	12/7/2016	4.820	103.347	103.347	103.347	102.809	102.122	101.446	100.799	100.265
6/8/2007	6/8/2017	12/8/2016	4.490	103.130	103.130	103.130	102.590	101.901	101.226	100.598	100.129
6/18/2007	6/19/2017	12/19/2016	4.500	103.275	103.275	103.275	102.702	101.983	101.278	100.622	100.131
6/19/2007	6/19/2017	12/19/2016	4.650	103.384	103.384	103.384	102.811	102.091	101.384	100.717	100.193
6/22/2007	6/22/2017	12/22/2016	4.500	103.312	103.312	103.312	102.730	102.003	101.290	100.628	100.131
6/28/2007	6/28/2017	12/28/2016	4.500	103.387	103.387	103.387	102.787	102.044	101.315	100.638	100.130
7/13/2007	7/13/2017	10/13/2016	4.290	103.408	103.408	103.408	102.763	101.980	101.220	100.542	100.086
7/20/2007	7/20/2017	10/20/2016	4.290	103.491	103.491	103.491	102.825	102.024	101.246	100.551	100.087
7/27/2007	7/27/2017	10/27/2016	4.250	103.541	103.541	103.541	102.854	102.034	101.239	100.533	100.076
7/30/2007	1/30/2019	10/31/2016	3.990	109.442	109.442	109.284	106.899	104.642	102.629	101.049	100.145
7/31/2007	7/31/2017	10/31/2016	3.990	103.369	103.369	103.369	102.671	101.843	101.052	100.377	100.001
7/31/2007	7/31/2017	10/31/2016	3.990	103.369	103.369	103.369	102.671	101.843	101.052	100.377	100.001
7/31/2007	7/31/2017	10/31/2016	4.060	103.428	103.428	103.428	102.730	101.901	101.106	100.420	100.021
8/2/2007	8/2/2017	11/2/2016	4.050	103.442	103.442	103.442	102.738	101.904	101.108	100.428	100.031
8/9/2007	8/9/2017	11/9/2016	3.990	103.469	103.469	103.469	102.743	101.891	101.080	100.391	100.009
8/16/2007	8/16/2017	11/16/2016	3.990	103.546	103.546	103.546	102.799	101.929	101.099	100.399	100.001
8/17/2007	8/17/2017	11/17/2016	4.000	103.566	103.566	103.566	102.816	101.943	101.110	100.405	100.002
9/4/2007	9/5/2017	12/5/2016	3.890	103.674	103.674	103.674	102.865	101.944	101.076	100.373	99.966
9/10/2007	9/11/2017	12/12/2016	3.690	103.546	103.546	103.546	102.719	101.786	100.922	100.261	99.898
9/11/2007	9/11/2017	12/12/2016	3.590	103.450	103.450	103.450	102.624	101.693	100.840	100.208	99.872
9/13/2007	9/13/2017	12/13/2016	3.990	103.857	103.857	103.857	103.022	102.078	101.183	100.439	99.986
9/27/2007	9/27/2017	12/27/2016	3.650	103.670	103.670	103.670	102.793	101.818	100.919	100.238	99.858
10/11/2007	10/11/2017	10/11/2016	3.990	104.167	104.167	104.167	103.245	102.224	101.261	100.469	100.034
10/15/2007	10/16/2017	10/17/2016	3.990	104.222	104.222	104.222	103.284	102.248	101.272	100.468	100.028
10/26/2007	10/26/2017	10/26/2016	3.390	103.682	103.682	103.682	102.716	101.671	100.747	100.132	99.942
11/5/2007	11/6/2017	11/7/2016	4.390	104.902	104.902	104.902	103.895	102.793	101.736	100.806	100.170
11/6/2007	11/6/2017	11/7/2016	3.480	103.886	103.886	103.886	102.885	101.809	100.852	100.186	99.927
11/19/2007	11/20/2017	11/19/2012	4.290	104.957	104.957	104.957	103.906	102.762	101.636	100.527	99.435
11/20/2007	11/20/2017	11/21/2016	3.740	104.321	104.321	104.321	103.274	102.149	101.114	100.324	99.944
11/23/2007	11/24/2017	11/23/2011	3.990	104.655	104.655	104.655	103.592	102.439	101.304	100.187	99.087
11/23/2007	11/24/2017	11/23/2011	3.990	104.655	104.655	104.655	103.592	102.439	101.304	100.187	99.087
11/29/2007	11/29/2017	11/29/2016	2.950	103.482	103.482	103.482	102.417	101.319	100.438	99.975	99.780
11/30/2007	11/30/2017	11/30/2016	3.190	103.775	103.775	103.775	102.702	101.579	100.622	100.050	99.818
12/10/2007	12/11/2017	12/12/2016	3.450	104.188	104.188	104.188	103.077	101.913	100.887	100.184	99.843

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Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
12/24/2007	12/26/2017	12/24/2012	3.990	105.009	105.009	105.009	103.845	102.604	101.384	100.184	99.004
1/7/2008	1/8/2018	10/7/2016	2.590	103.345	103.345	103.345	102.172	101.050	100.247	99.988	99.969
1/8/2008	1/8/2018	10/11/2016	2.570	103.319	103.319	103.319	102.147	101.028	100.233	99.980	99.950
1/8/2008	1/8/2018	10/11/2016	2.640	103.410	103.410	103.410	102.234	101.101	100.277	99.982	99.953
1/11/2008	1/11/2018	10/11/2016	2.720	103.536	103.536	103.536	102.347	101.192	100.331	99.984	99.955
1/14/2008	1/16/2018	10/14/2016	3.240	104.257	104.257	104.257	103.037	101.799	100.753	100.111	99.963
1/16/2008	1/16/2018	10/17/2016	2.380	103.127	103.127	103.127	101.941	100.846	100.140	99.960	99.914
1/17/2008	1/17/2018	10/17/2016	2.250	102.962	102.962	102.962	101.784	100.724	100.093	99.954	99.908
1/18/2008	1/18/2018	10/18/2016	2.290	103.021	103.021	103.021	101.836	100.762	100.107	99.953	99.905
2/14/2008	2/14/2018	2/14/2012	3.190	104.448	104.448	104.448	103.129	101.758	100.410	99.087	97.788
3/7/2008	3/7/2018	12/7/2016	3.550	105.157	105.157	105.157	103.773	102.383	101.161	100.300	99.888
3/14/2008	3/14/2018	12/14/2016	2.400	103.533	103.533	103.533	102.179	100.964	100.173	99.821	99.609
3/17/2008	3/19/2018	12/19/2016	3.300	104.904	104.904	104.904	103.487	102.089	100.904	100.144	99.791
4/28/2008	4/30/2018	10/28/2016	2.150	103.446	103.446	103.446	101.978	100.754	100.074	99.916	99.842
4/30/2008	4/30/2018	4/30/2013	3.740	105.994	105.994	105.994	104.425	102.839	101.285	99.762	98.269
5/23/2008	5/23/2018	11/23/2016	3.270	105.450	105.450	105.450	103.824	102.272	100.970	100.153	99.856
6/30/2008	7/2/2018	6/30/2011	3.690	106.560	106.560	106.559	104.779	103.020	101.299	99.616	97.968
7/11/2008	7/11/2018	7/11/2012	3.750	106.760	106.760	106.757	104.947	103.163	101.418	99.711	98.041
7/14/2008	7/16/2018	10/14/2016	2.500	104.541	104.541	104.537	102.800	101.311	100.291	99.972	99.934
7/14/2008	7/16/2018	10/14/2016	3.250	105.904	105.904	105.899	104.102	102.429	101.045	100.180	99.963
7/17/2008	7/17/2018	10/14/2016	3.750	106.822	106.822	106.817	104.989	103.189	101.428	99.706	98.021
8/15/2008	8/15/2018	11/15/2016	3.830	107.277	107.277	107.257	105.350	103.530	101.905	100.658	100.023
12/27/2011	12/27/2021	12/29/2014	3.550	118.873	118.873	116.196	110.729	105.551	100.652	96.015	91.624
5/15/2012	5/15/2017	11/17/2014	1.950	101.229	101.229	101.229	100.763	100.145	99.534	98.931	98.335
6/20/2012	6/20/2017	6/22/2015	1.630	101.191	101.191	101.191	100.620	99.906	99.203	98.509	97.825
7/16/2012	7/17/2017	7/16/2014	1.720	101.385	101.385	101.385	100.735	99.949	99.176	98.415	97.666
7/18/2012	7/18/2018	7/20/2015	2.720	104.956	104.956	104.951	103.134	101.349	99.603	97.895	96.224
7/19/2012	7/19/2017	7/21/2014	1.690	101.371	101.371	101.371	100.714	99.924	99.146	98.380	97.626
10/1/2012	10/1/2019	4/1/2015	2.250	106.849	106.849	106.399	103.358	100.415	97.572	94.825	92.169
10/5/2012	10/5/2017	10/6/2014	1.630	101.675	101.675	101.675	100.781	99.785	98.807	97.848	96.906
3/8/2013	3/8/2018	3/9/2015	1.780	102.591	102.591	102.591	101.214	99.795	98.402	97.036	95.694
5/7/2014	5/7/2018	5/7/2015	1.760	102.855	102.855	102.855	101.286	99.707	98.160	96.645	95.160
10/16/2014	10/16/2018	10/17/2016	0.459	105.049	105.049	104.984	102.916	100.896	99.921	99.875	99.830
10/24/2014	10/24/2018	10/26/2015	1.740	103.644	103.644	103.572	101.498	99.472	97.497	95.570	93.691
10/24/2014	10/24/2018	10/26/2015	1.740	103.644	103.644	103.572	101.498	99.472	97.497	95.570	93.691
2/20/2015	2/20/2019	2/22/2016	1.790	104.340	104.340	104.166	101.759	99.417	97.139	94.925	92.772
3/26/2015	3/26/2019	3/29/2016	1.610	104.056	104.056	103.848	101.352	98.926	96.570	94.282	92.059
3/26/2015	3/26/2020	3/29/2016	1.590	105.622	105.622	104.860	101.366	98.004	94.771	91.661	88.670
6/29/2015	7/1/2019	6/29/2017	0.574	105.573	105.573	105.252	102.959	101.082	99.874	99.268	98.950
7/30/2015	7/30/2019	8/1/2016	1.800	105.164	105.164	104.806	101.957	99.197	96.525	93.939	91.434
8/14/2015	8/14/2025	8/14/2020	1.850	116.648	116.600	110.810	104.983	100.056	95.773	91.950	88.456
8/19/2015	8/19/2025	8/21/2017	0.990	108.921	108.870	105.287	101.909	99.838	98.542	97.587	96.739
8/25/2015	8/25/2020	8/25/2017	0.950	103.759	103.759	103.136	100.929	99.461	98.401	97.505	96.661
8/26/2015	8/26/2025	8/26/2020	1.750	115.806	115.730	110.098	104.363	99.502	95.259	91.457	87.970
9/14/2015	9/14/2020	9/14/2017	1.050	104.214	104.214	103.531	101.181	99.575	98.411	97.446	96.549
9/15/2015	9/16/2019	9/15/2016	1.750	105.254	105.254	104.827	101.849	98.968	96.184	93.491	90.888
9/18/2015	9/18/2020	9/18/2017	1.090	104.386	104.386	103.681	101.275	99.626	98.435	97.455	96.547
9/29/2015	9/30/2019	9/29/2016	1.610	104.896	104.896	104.450	101.439	98.528	95.716	92.998	90.371
10/2/2015	10/2/2020	10/2/2017	0.890	103.616	103.616	102.992	100.807	99.288	98.135	97.140	96.203
10/2/2015	10/2/2025	10/2/2020	1.690	115.438	115.314	109.739	103.998	99.106	94.816	90.958	87.412
11/6/2015	11/6/2020	11/6/2017	1.050	104.368	104.368	103.622	101.188	99.451	98.127	97.000	95.949
11/6/2015	11/7/2022	11/6/2018	1.400	108.667	108.667	106.370	102.600	99.598	97.104	94.928	92.935
12/4/2015	12/4/2025	12/4/2018	1.360	112.661	112.459	107.794	103.256	99.801	97.041	94.704	92.607
12/8/2015	12/8/2020	12/8/2016	0.381	105.672	105.672	104.742	101.989	100.327	99.674	99.442	99.256
12/11/2015	12/12/2022	12/11/2017	0.355	109.675	109.675	106.743	103.371	101.066	99.578	98.652	98.042
12/15/2015	12/16/2019	12/15/2016	0.600	104.358	104.358	103.923	101.613	100.213	99.662	99.430	99.226
12/15/2015	12/15/2022	12/15/2017	0.350	109.660	109.660	106.716	103.359	101.128	99.795	99.081	98.700
12/18/2015	12/18/2020	12/18/2017	0.607	106.701	106.701	105.507	102.946	101.136	99.983	99.323	98.947

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
12/24/2015	12/24/2020	12/26/2017	1.250	105.367	105.367	104.459	101.713	99.700	98.158	96.864	95.676
12/24/2015	12/24/2025	12/24/2020	1.990	118.637	118.351	112.029	105.767	100.441	95.797	91.650	87.866
1/8/2016	1/8/2019	1/9/2017	1.120	102.582	102.582	102.479	100.901	100.044	99.654	99.376	99.107
1/12/2016	1/13/2020	1/12/2017	0.067	105.541	105.541	105.008	102.524	100.849	100.064	99.873	99.836
1/19/2016	1/19/2021	1/19/2018	1.150	105.021	105.021	104.121	101.441	99.455	97.896	96.558	95.316
1/19/2016	1/20/2026	1/22/2019	1.350	112.744	112.502	107.758	103.066	99.376	96.331	93.688	91.288
1/22/2016	1/22/2020	1/23/2017	0.102	104.287	104.287	103.794	101.596	100.327	99.879	99.777	99.724
1/29/2016	1/29/2021	1/30/2017	0.152	105.615	105.615	104.575	101.939	100.422	99.860	99.721	99.648
2/2/2016	2/2/2021	2/2/2018	0.159	106.013	106.013	104.729	102.357	100.747	99.758	99.233	98.979
2/17/2016	2/17/2021	2/17/2017	0.204	103.405	103.405	102.623	100.726	99.925	99.659	99.522	99.397
2/26/2016	2/26/2020	2/27/2017	0.225	103.679	103.679	103.180	101.132	100.040	99.616	99.429	99.275
2/26/2016	2/26/2021	2/26/2018	0.890	103.979	103.979	103.170	100.702	98.824	97.272	95.878	94.555
2/26/2016	2/26/2026	2/26/2021	1.490	114.219	113.888	108.377	102.552	97.517	93.039	88.968	85.202
3/8/2016	3/8/2023	3/8/2018	0.990	106.461	106.461	104.460	101.393	99.171	97.441	95.962	94.594
3/18/2016	3/18/2020	3/20/2017	0.257	104.834	104.834	104.241	101.839	100.306	99.548	99.210	98.983
4/5/2016	4/5/2021	4/2/2018	0.990	104.531	104.531	102.854	99.430	98.577	97.123	95.697	94.299
4/8/2016	4/8/2020	4/10/2017	0.061	103.407	103.407	102.870	101.031	100.124	99.818	99.748	99.728
4/12/2016	4/12/2021	4/12/2017	0.067	103.675	103.675	102.761	100.857	100.024	99.772	99.713	99.687
4/28/2016	4/28/2020	4/28/2017	0.143	104.000	104.000	103.387	101.327	100.185	99.721	99.569	99.492
4/28/2016	4/28/2021	4/28/2017	0.143	104.983	104.983	103.852	101.484	100.218	99.724	99.569	99.492
4/28/2016	4/28/2021	4/30/2018	0.143	105.971	105.971	104.243	101.744	100.184	99.370	99.004	98.843
5/2/2016	5/2/2023	5/4/2018	0.159	107.678	107.678	104.659	102.005	100.386	99.480	99.026	98.805
5/2/2016	5/4/2026	5/2/2017	0.159	107.844	107.569	104.076	101.360	100.115	99.671	99.521	99.433
5/5/2016	5/5/2021	5/7/2018	0.890	104.147	104.147	103.266	100.671	98.621	96.881	95.305	93.810
5/5/2016	5/5/2026	5/5/2021	1.490	114.500	114.087	108.422	102.448	97.262	92.640	88.433	84.542
5/6/2016	5/6/2026	5/8/2017	0.188	106.567	106.324	103.284	100.937	99.943	99.595	99.454	99.351
5/10/2016	5/11/2026	5/10/2017	0.490	104.775	104.595	102.482	100.435	99.360	98.667	98.068	97.486
5/12/2016	5/12/2026	5/12/2017	0.490	104.776	104.594	102.480	100.429	99.350	98.654	98.050	97.463
5/13/2016	5/13/2026	5/15/2017	0.217	106.939	106.669	103.489	101.022	99.945	99.552	99.387	99.265
5/17/2016	5/17/2021	5/17/2018	0.204	105.572	105.572	103.813	101.408	99.949	99.173	98.797	98.598
5/20/2016	5/20/2026	5/22/2017	0.590	105.765	105.542	103.047	100.679	99.427	98.660	98.023	97.412
6/3/2016	6/3/2026	6/5/2017	0.185	107.468	107.156	103.787	101.155	99.905	99.390	99.147	98.965
6/6/2016	6/8/2020	6/6/2017	0.185	104.646	104.646	103.934	101.657	100.241	99.511	99.174	98.973
6/6/2016	6/6/2031	6/6/2017	0.590	108.784	106.985	103.693	100.897	99.373	98.437	97.688	96.982
6/8/2016	6/8/2026	6/8/2017	0.590	105.796	105.564	103.074	100.692	99.384	98.557	97.872	97.218
6/14/2016	6/16/2031	6/14/2017	0.490	107.308	105.774	102.970	100.554	99.264	98.442	97.746	97.079
6/16/2016	6/16/2020	6/16/2017	0.204	104.433	104.433	103.499	100.947	99.737	99.278	99.039	98.838
6/16/2016	6/16/2026	6/18/2018	0.690	106.794	106.524	103.661	100.535	98.217	96.319	94.625	93.030
6/16/2016	6/16/2031	6/16/2021	1.210	118.052	114.719	108.008	101.477	95.996	91.209	86.904	82.948
6/24/2016	6/24/2026	6/26/2017	0.590	105.822	105.583	103.058	100.645	99.304	98.437	97.708	97.010
6/27/2016	6/27/2031	6/27/2018	0.690	110.314	108.218	104.397	100.821	98.292	96.295	94.555	92.930
6/27/2016	6/27/2031	6/27/2019	0.910	113.603	110.948	106.027	101.328	97.680	94.636	91.941	89.450
6/30/2016	6/30/2020	6/30/2017	0.238	104.292	104.292	103.329	100.812	99.652	99.190	98.922	98.684
6/30/2016	6/30/2021	6/30/2017	0.590	102.841	102.841	102.136	100.326	99.214	98.400	97.671	96.964
7/8/2016	7/8/2026	7/10/2017	0.450	104.458	104.267	102.280	100.264	99.080	98.229	97.474	96.744
7/14/2016	7/14/2021	7/14/2017	0.023	104.016	104.016	102.880	100.903	99.958	99.603	99.500	99.465
7/22/2016	7/22/2026	7/24/2017	0.550	105.470	105.234	102.836	100.505	99.153	98.225	97.428	96.663
7/22/2016	7/22/2026	7/24/2017	0.550	105.470	105.234	102.836	100.505	99.153	98.225	97.428	96.663
7/28/2016	7/28/2026	7/30/2018	0.043	109.637	109.138	104.212	101.444	99.882	99.078	98.697	98.520
8/1/2016	8/1/2031	8/1/2017	0.490	107.371	105.818	103.002	100.527	99.100	98.131	97.308	96.524
8/11/2016	8/11/2026	8/13/2018	0.810	108.102	107.744	104.434	100.954	98.356	96.240	94.374	92.634
8/12/2016	8/12/2021	8/14/2017	0.018	104.063	104.063	102.854	100.798	99.752	99.285	99.084	98.963
8/19/2016	8/19/2021	8/21/2017	0.011	104.224	104.224	102.972	100.848	99.744	99.237	99.011	98.870
9/2/2016	9/2/2026	9/5/2017	0.690	106.943	106.606	103.719	100.948	99.259	98.116	97.180	96.309
9/9/2016	9/9/2026	9/10/2018	0.800	108.066	107.678	104.388	100.880	98.231	96.051	94.120	92.316
9/9/2016	9/9/2031	9/11/2017	0.390	105.908	104.606	102.313	100.126	98.769	97.749	96.837	95.960
9/12/2016	9/12/2031	9/12/2017	0.390	105.911	104.606	102.308	100.121	98.763	97.741	96.828	95.948
9/15/2016	9/15/2026	9/16/2019	0.990	109.999	108.687	103.888	100.049	96.894	94.043	91.353	88.773

Start Date	Maturity Date	Next Call Date	Coupon	-300	-200	-100	Base	+100	+200	+300	+400
9/15/2016	9/15/2026	9/16/2019	0.990	109.999	108.687	103.888	100.049	96.894	94.043	91.353	88.773
9/16/2016	9/16/2021	9/18/2017	0.004	104.710	104.710	103.325	101.011	99.699	99.030	98.689	98.464
9/22/2016	9/22/2031	9/22/2017	0.390	105.922	104.607	102.293	100.088	98.713	97.669	96.732	95.828
9/22/2016	9/22/2031	9/24/2018	0.650	109.873	107.795	104.125	100.508	97.834	95.645	93.698	91.872
9/26/2016	9/26/2031	9/26/2017	0.420	106.383	104.971	102.490	100.172	98.742	97.674	96.724	95.810
10/3/2016	10/5/2026	10/3/2017	0.590	105.986	105.678	103.125	100.583	98.977	97.816	96.824	95.887