

## **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     |
|------------|---------------|----------------|---------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|
| 7/30/2007  | 1/30/2019     | 1/30/2019      | 3.99000 | 101.00846 | 100.84001 | 100.59052 | 100.34293 | 100.09707 | 99.85306 | 99.61083 | 99.37036 |
| 12/27/2011 | 12/27/2021    | 12/29/2014     | 3.55000 | 109.96725 | 106.84420 | 103.71997 | 100.70492 | 97.79473  | 94.98521 | 92.27241 | 89.65253 |
| 10/1/2012  | 10/1/2019     | 4/1/2015       | 2.25000 | 102.04359 | 101.22822 | 100.31967 | 99.42376  | 98.54024  | 97.66888 | 96.80946 | 95.96176 |
| 2/20/2015  | 2/20/2019     | 2/22/2016      | 1.79000 | 100.55674 | 100.34065 | 100.03688 | 99.73566  | 99.43675  | 99.14021 | 98.84598 | 98.55405 |
| 3/26/2015  | 3/26/2019     | 3/29/2016      | 1.61000 | 100.65280 | 100.35156 | 99.95447  | 99.56090  | 99.17080  | 98.78413 | 98.40085 | 98.02090 |
| 3/26/2015  | 3/26/2020     | 3/29/2016      | 1.59000 | 101.96565 | 100.66970 | 99.29329  | 97.94248  | 96.61658  | 95.31528 | 94.03774 | 92.78350 |
| 6/29/2015  | 7/1/2019      | 6/29/2017      | 2.74000 | 101.84312 | 101.28051 | 100.61737 | 99.96184  | 99.31380  | 98.67311 | 98.03968 | 97.41336 |
| 7/30/2015  | 7/30/2019     | 6/29/2017      | 1.80000 | 101.34606 | 100.70492 | 99.96677  | 99.23767  | 98.51745  | 97.80597 | 97.10306 | 96.40860 |
| 8/14/2015  | 8/14/2025     | 8/14/2020      | 1.85000 | 108.45194 | 103.63819 | 100.14683 | 97.78691  | 95.97302  | 94.32382 | 92.72450 | 91.16086 |
| 8/26/2015  | 8/26/2025     | 8/26/2020      | 1.75000 | 107.88009 | 103.19856 | 99.82521  | 97.51909  | 95.70519  | 94.03269 | 92.40867 | 90.82114 |
| 9/15/2015  | 9/16/2019     | 9/15/2016      | 1.75000 | 101.51638 | 100.74268 | 99.87559  | 99.02018  | 98.17631  | 97.34373 | 96.52224 | 95.71165 |
| 9/29/2015  | 9/30/2019     | 9/29/2016      | 1.61000 | 101.44407 | 100.63272 | 99.72868  | 98.83722  | 97.95808  | 97.09103 | 96.23586 | 95.39234 |
| 10/2/2015  | 10/2/2025     | 10/2/2020      | 1.69000 | 107.59069 | 102.94538 | 99.57684  | 97.20938  | 95.31041  | 93.55202 | 91.84641 | 90.18088 |
| 11/6/2015  | 11/6/2018     | 11/6/2018      | 1.40000 | 100.02333 | 100.01448 | 99.99812  | 99.98184  | 99.96565  | 99.94954 | 99.93351 | 99.91756 |
| 12/4/2015  | 12/4/2025     | 12/4/2018      | 1.36000 | 105.77189 | 101.86572 | 100.02466 | 99.89245  | 99.80047  | 99.70902 | 99.61810 | 99.52771 |
| 12/24/2015 | 12/24/2025    | 12/24/2020     | 1.99000 | 109.59592 | 104.39658 | 100.44125 | 97.58011  | 95.35490  | 93.37445 | 91.48016 | 89.63742 |
| 1/19/2016  | 1/20/2026     | 1/22/2019      | 1.35000 | 105.77573 | 101.85336 | 100.02428 | 99.71456  | 99.49225  | 99.27154 | 99.05235 | 98.83473 |
| 2/26/2016  | 2/26/2026     | 2/26/2021      | 1.49000 | 106.70867 | 102.07073 | 98.64817  | 96.03295  | 93.80114  | 91.71625 | 89.70107 | 87.74131 |
| 5/5/2016   | 5/5/2026      | 5/5/2021       | 1.49000 | 106.73271 | 102.06023 | 98.49207  | 95.70718  | 93.30964  | 91.07295 | 88.91665 | 86.82382 |
| 6/16/2016  | 6/16/2031     | 6/16/2021      | 1.21000 | 107.04563 | 101.61488 | 97.74342  | 94.81342  | 92.31711  | 89.99627 | 87.76399 | 85.60030 |
| 6/27/2016  | 6/27/2031     | 6/27/2019      | 0.91000 | 104.75577 | 101.00099 | 99.47057  | 98.76552  | 98.13230  | 97.50694 | 96.88858 | 96.27712 |
| 9/15/2016  | 9/15/2026     | 9/16/2019      | 0.99000 | 104.08739 | 100.79934 | 99.26638  | 98.35583  | 97.51397  | 96.68442 | 95.86593 | 95.05830 |
| 1/13/2017  | 1/13/2027     | 1/14/2019      | 1.31000 | 106.11776 | 101.91642 | 100.02291 | 99.73903  | 99.53844  | 99.33917 | 99.14139 | 98.94482 |
| 1/20/2017  | 1/22/2024     | 1/22/2019      | 1.43900 | 110.36329 | 105.65698 | 102.00980 | 99.99137  | 99.71685  | 99.65972 | 99.60314 | 99.54714 |
| 1/24/2017  | 1/24/2024     | 1/24/2019      | 1.44738 | 111.24858 | 106.42870 | 102.56968 | 100.19355 | 99.70531  | 99.64251 | 99.58061 | 99.51934 |
| 1/30/2017  | 1/30/2027     | 1/30/2020      | 1.49038 | 114.26402 | 108.14804 | 103.38234 | 100.30535 | 98.93118  | 98.57125 | 98.48247 | 98.42285 |
| 3/7/2017   | 3/8/2027      | 3/7/2019       | 1.50000 | 107.41365 | 102.68332 | 100.21862 | 99.59210  | 99.25253  | 98.91684 | 98.58392 | 98.25373 |
| 3/20/2017  | 3/20/2024     | 3/20/2019      | 1.55000 | 105.89123 | 102.09521 | 100.09864 | 99.56143  | 99.18788  | 98.81780 | 98.45091 | 98.08715 |
| 4/13/2017  | 4/15/2024     | 4/15/2019      | 1.45000 | 105.45166 | 101.79614 | 99.98358  | 99.41829  | 98.97509  | 98.53635 | 98.10168 | 97.67102 |
| 4/28/2017  | 4/28/2022     | 4/29/2019      | 1.59000 | 104.25156 | 101.52583 | 100.01573 | 99.43140  | 98.95089  | 98.47530 | 98.00431 | 97.53784 |
| 4/28/2017  | 4/29/2024     | 4/29/2019      | 1.50925 | 110.32130 | 105.59208 | 101.94632 | 99.88844  | 99.44903  | 99.37028 | 99.29728 | 99.22533 |
| 6/5/2017   | 6/5/2024      | 6/5/2019       | 1.31563 | 109.49866 | 104.89937 | 101.47982 | 99.72142  | 99.42030  | 99.40867 | 99.40311 | 99.39844 |
| 6/14/2017  | 6/14/2022     | 6/14/2019      | 1.59000 | 104.38045 | 101.57260 | 99.98723  | 99.26578  | 98.66508  | 98.07210 | 97.48555 | 96.90534 |
| 6/27/2017  | 6/27/2022     | 6/27/2019      | 1.60000 | 104.44986 | 101.60846 | 99.98796  | 99.22012  | 98.58414  | 97.95716 | 97.33719 | 96.72414 |
| 7/3/2017   | 7/3/2022      | 7/3/2019       | 1.39813 | 107.02224 | 103.94773 | 101.41145 | 99.80765  | 99.36424  | 99.34036 | 99.34024 | 99.34024 |
| 7/14/2017  | 7/14/2022     | 7/15/2019      | 1.62000 | 104.56587 | 101.67417 | 99.99159  | 99.16421  | 98.48032  | 97.80701 | 97.14156 | 96.48385 |
| 7/24/2017  | 7/25/2022     | 7/24/2019      | 1.63000 | 104.63193 | 101.71030 | 99.99621  | 99.13572  | 98.42737  | 97.73079 | 97.04252 | 96.36241 |
| 7/28/2017  | 7/28/2022     | 7/29/2019      | 1.60000 | 104.53417 | 101.64248 | 99.95712  | 99.09195  | 98.37059  | 97.66105 | 96.96007 | 96.26750 |
| 8/1/2017   | 8/3/2020      | 11/1/2018      | 2.79000 | 104.51413 | 102.75258 | 101.14390 | 100.08865 | 99.99812  | 99.99543 | 99.99275 | 99.99008 |
| 8/11/2017  | 8/11/2022     | 8/12/2019      | 1.59000 | 104.53626 | 101.62844 | 99.93164  | 99.03513  | 98.27949  | 97.53667 | 96.80307 | 96.07853 |
| 8/25/2017  | 8/25/2022     | 8/26/2019      | 1.55000 | 104.42922 | 101.54015 | 99.86601  | 98.94145  | 98.14899  | 97.37028 | 96.60153 | 95.84255 |
| 9/5/2017   | 9/6/2022      | 9/5/2019       | 1.55000 | 104.46051 | 101.55042 | 99.85190  | 98.89740  | 98.07837  | 97.27414 | 96.48041 | 95.69699 |
| 9/12/2017  | 9/12/2022     | 9/12/2019      | 1.49000 | 104.25817 | 101.40764 | 99.76757  | 98.81429  | 97.97856  | 97.15699 | 96.34630 | 95.54629 |
| 9/18/2017  | 9/19/2022     | 9/18/2019      | 1.62000 | 104.75094 | 101.74332 | 99.92398  | 98.90324  | 98.04801  | 97.21051 | 96.38426 | 95.56901 |
| 9/22/2017  | 9/22/2022     | 9/23/2019      | 1.65000 | 104.86972 | 101.82457 | 99.95692  | 98.91023  | 98.04109  | 97.19092 | 96.35229 | 95.52494 |
| 10/10/2017 | 10/11/2022    | 10/10/2019     | 1.75000 | 105.30000 | 102.11167 | 100.08328 | 98.93574  | 98.01581  | 97.12191 | 96.24065 | 95.37163 |
| 10/23/2017 | 10/24/2022    | 10/23/2019     | 1.79000 | 105.49259 | 102.23768 | 100.13504 | 98.93275  | 97.97865  | 97.05418 | 96.14314 | 95.24505 |
| 11/6/2017  | 11/6/2018     | 11/6/2018      | 1.34050 | 100.03883 | 100.02999 | 100.01361 | 99.98090  | 99.98109  | 99.96496 | 99.94890 | 99.93293 |
| 11/6/2017  | 11/7/2022     | 11/6/2019      | 1.82000 | 105.65649 | 102.33936 | 100.16428 | 98.90587  | 97.91298  | 96.95284 | 96.00704 | 95.07503 |
| 11/17/2017 | 11/17/2022    | 11/18/2019     | 1.88000 | 105.92302 | 102.53262 | 100.25434 | 98.92424  | 97.89434  | 96.90361 | 95.92817 | 94.96727 |
| 11/17/2017 | 11/19/2022    | 11/19/2018     | 1.31175 | 107.78832 | 104.05335 | 101.22662 | 99.94653  | 99.89527  | 99.84429 | 99.79358 | 99.74314 |
| 12/4/2017  | 12/5/2022     | 12/4/2018      | 1.32075 | 108.32926 | 104.51142 | 101.53475 | 99.97764  | 99.89370  | 99.88319 | 99.87286 | 99.86271 |
| 12/4/2017  | 12/5/2022     | 12/4/2019      | 2.00000 | 106.46251 | 102.93470 | 100.46456 | 99.00664  | 97.92221  | 96.89059 | 95.87589 | 94.87673 |
| 12/14/2017 | 12/14/2022    | 12/16/2019     | 2.04000 | 106.65686 | 103.07783 | 100.53490 | 99.01307  | 97.88696  | 96.82427 | 95.77977 | 94.75159 |
| 12/18/2017 | 12/19/2022    | 12/18/2018     | 1.75000 | 105.51750 | 102.19511 | 100.24685 | 99.89520  | 99.76484  | 99.63530 | 99.50655 | 99.37859 |
| 1/12/2018  | 1/14/2023     | 1/14/2019      | 1.42519 | 108.83887 | 104.92707 | 101.79951 | 100.00968 | 99.76782  | 99.73235 | 99.69746 | 99.66288 |
| 1/19/2018  | 1/19/2023     | 1/21/2020      | 2.26000 | 107.70407 | 103.89095 | 101.01716 | 99.20255  | 97.93887  | 96.78453 | 95.65406 | 94.54235 |
| 1/29/2018  | 1/30/2023     | 1/29/2019      | 2.05000 | 106.88027 | 103.19807 | 100.69566 | 99.86318  | 99.61783  | 99.37803 | 99.13993 | 98.90355 |
| 2/2/2018   | 2/4/2023      | 2/4/2019       | 0.59856 | 110.50707 | 106.43641 | 102.95239 | 100.45705 | 99.55548  | 99.52909 | 99.51234 | 99.51402 |
| 2/2/2018   | 2/4/2023      | 2/4/2019       | 1.34856 | 109.42809 | 105.45486 | 102.20647 | 100.16403 | 99.73718  | 99.72756 | 99.71947 | 99.71181 |
| 2/9/2018   | 2/9/2023      | 2/10/2020      | 2.33000 | 108.09265 | 104.19008 | 101.18961 | 99.25180  | 97.90893  | 96.70135 | 95.52209 | 94.36309 |

| Start Date | Maturity Date | Next Call Date | Coupon  | -300      | -200      | -100      | Base      | +100     | +200     | +300     | +400     |
|------------|---------------|----------------|---------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|
| 2/9/2018   | 2/9/2023      | 2/9/2022       | 2.77000 | 109.95396 | 105.75096 | 101.92117 | 98.47234  | 95.33924 | 92.42351 | 89.64781 | 86.97927 |
| 2/16/2018  | 2/19/2023     | 2/19/2019      | 1.31519 | 109.84299 | 105.81529 | 102.45854 | 100.25075 | 99.65741 | 99.60299 | 99.55429 | 99.50624 |
| 2/20/2018  | 2/21/2023     | 2/20/2020      | 2.44000 | 108.61569 | 104.61736 | 101.47894 | 99.40827  | 97.99379 | 96.75525 | 95.55056 | 94.36702 |
| 2/20/2018  | 2/21/2023     | 2/22/2022      | 2.87000 | 110.45337 | 106.19293 | 102.30114 | 98.79052  | 95.60565 | 92.64792 | 89.83904 | 87.14095 |
| 3/5/2018   | 3/6/2023      | 3/5/2019       | 1.06563 | 110.01119 | 105.96838 | 102.57709 | 100.27428 | 99.57541 | 99.54999 | 99.53924 | 99.52903 |
| 3/15/2018  | 3/15/2023     | 3/15/2019      | 1.08413 | 110.26379 | 106.19029 | 102.74062 | 100.34506 | 99.53518 | 99.47792 | 99.44287 | 99.40850 |
| 3/20/2018  | 3/20/2023     | 3/20/2019      | 0.33750 | 111.10179 | 106.94864 | 103.31910 | 100.56056 | 99.29122 | 99.14494 | 99.09681 | 99.04957 |
| 3/21/2018  | 3/21/2023     | 3/21/2019      | 0.35338 | 111.10112 | 106.94624 | 103.31453 | 100.55307 | 99.28272 | 99.13409 | 99.08332 | 99.03346 |
| 3/29/2018  | 3/29/2023     | 3/29/2019      | 1.14600 | 110.72879 | 106.60122 | 103.05130 | 100.48394 | 99.47537 | 99.35459 | 99.28173 | 99.20982 |
| 4/5/2018   | 4/5/2023      | 4/5/2019       | 0.10825 | 111.38726 | 107.21921 | 103.56065 | 100.68718 | 99.20438 | 99.00827 | 98.99993 | 98.99332 |
| 4/13/2018  | 4/15/2023     | 4/15/2019      | 0.13631 | 111.57207 | 107.37843 | 103.67425 | 100.73043 | 99.15400 | 98.89159 | 98.85561 | 98.82240 |
| 4/27/2018  | 4/29/2023     | 4/29/2019      | 0.50925 | 112.34715 | 108.09893 | 104.29450 | 101.17799 | 99.32314 | 98.88353 | 98.80505 | 98.73446 |
| 5/4/2018   | 5/4/2023      | 5/6/2019       | 2.63000 | 109.81538 | 105.55434 | 102.14169 | 100.15707 | 99.44247 | 98.94436 | 98.45364 | 97.96772 |
| 5/4/2018   | 5/6/2023      | 5/6/2019       | 0.34050 | 112.13056 | 107.91700 | 104.17854 | 101.13293 | 99.35367 | 98.96789 | 98.94979 | 98.94083 |
| 5/8/2018   | 5/8/2023      | 5/8/2019       | 1.04325 | 111.21381 | 107.06370 | 103.46794 | 100.74243 | 99.46585 | 99.30153 | 99.28438 | 99.26911 |
| 5/17/2018  | 5/17/2023     | 5/17/2019      | 1.01175 | 111.46490 | 107.28823 | 103.64175 | 100.83169 | 99.44293 | 99.22062 | 99.17824 | 99.13893 |
| 5/17/2018  | 5/17/2023     | 5/18/2020      | 2.84000 | 110.83268 | 106.44122 | 102.74450 | 100.02958 | 98.15925 | 96.65631 | 95.23830 | 93.85181 |
| 5/24/2018  | 5/24/2021     | 5/24/2019      | 0.91175 | 106.67911 | 104.48738 | 102.45142 | 100.64016 | 99.43875 | 99.10775 | 99.04447 | 98.98695 |
| 5/24/2018  | 5/24/2023     | 5/26/2020      | 1.31175 | 108.87526 | 105.82987 | 102.99874 | 100.63370 | 99.04042 | 98.36147 | 98.23187 | 98.23187 |
| 6/5/2018   | 6/5/2023      | 6/5/2019       | 1.01563 | 110.55454 | 106.44176 | 102.93892 | 100.38975 | 99.33991 | 99.23134 | 99.22557 | 99.22147 |
| 6/5/2018   | 6/5/2023      | 6/5/2020       | 2.72000 | 110.39673 | 106.01016 | 102.37088 | 99.73214  | 97.88295 | 96.35046 | 94.89478 | 93.47111 |
| 6/25/2018  | 6/25/2021     | 6/25/2019      | 1.87263 | 105.69640 | 103.53540 | 101.60949 | 100.18953 | 99.65476 | 99.56678 | 99.50600 | 99.44649 |
| 6/25/2018  | 6/26/2023     | 6/25/2020      | 1.87263 | 107.86813 | 104.84954 | 102.19163 | 100.25601 | 99.24088 | 98.91890 | 98.83691 | 98.79471 |
| 6/25/2018  | 6/26/2023     | 6/25/2020      | 0.07263 | 109.46074 | 106.24022 | 103.18186 | 100.43166 | 98.18061 | 96.72629 | 96.10454 | 95.95505 |
| 6/27/2018  | 6/27/2023     | 6/27/2019      | 2.53000 | 109.64370 | 105.30995 | 101.92186 | 100.00991 | 99.19619 | 98.56398 | 97.94185 | 97.32665 |
| 7/2/2018   | 7/2/2023      | 7/2/2019       | 0.39838 | 110.90547 | 106.74286 | 103.12856 | 100.33276 | 98.92184 | 98.68786 | 98.68710 | 98.68710 |
| 7/2/2018   | 7/2/2023      | 7/2/2019       | 1.39838 | 109.90532 | 105.85422 | 102.48896 | 100.20589 | 99.41025 | 99.34875 | 99.34875 | 99.34875 |
| 7/2/2018   | 7/3/2023      | 7/2/2020       | 2.71000 | 110.50570 | 106.05544 | 102.36294 | 99.65802  | 97.73235 | 96.13020 | 94.61138 | 93.12758 |
| 7/30/2018  | 7/31/2023     | 7/30/2019      | 0.52038 | 111.61559 | 107.37952 | 103.61790 | 100.59771 | 98.85934 | 98.39780 | 98.30959 | 98.24137 |
| 7/30/2018  | 7/31/2023     | 7/30/2019      | 1.77038 | 110.36125 | 106.26401 | 102.80763 | 100.40808 | 99.46983 | 99.30693 | 99.23236 | 99.16057 |
| 8/23/2018  | 8/23/2023     | 8/23/2019      | 0.31025 | 110.72687 | 106.55281 | 102.90242 | 100.08075 | 98.62881 | 98.30703 | 98.24846 | 98.20241 |
| 8/28/2018  | 8/28/2023     | 8/28/2019      | 0.31725 | 110.72508 | 106.54568 | 102.88540 | 100.05709 | 98.59331 | 98.25351 | 98.18048 | 98.12111 |
| 9/4/2018   | 9/7/2021      | 9/4/2019       | 1.82075 | 105.27077 | 103.16305 | 101.31541 | 100.03734 | 99.61646 | 99.58105 | 99.57894 | 99.57826 |
| 9/25/2018  | 9/27/2021     | 9/25/2019      | 2.69000 | 106.79222 | 103.92490 | 101.50338 | 99.93477  | 98.96104 | 98.09829 | 97.25003 | 96.41321 |
| 9/25/2018  | 9/27/2021     | 9/25/2020      | 2.99000 | 107.67202 | 104.74555 | 102.04533 | 99.73398  | 97.78657 | 96.01040 | 94.29661 | 92.62347 |
| 10/3/2018  | 10/3/2023     | 10/3/2019      | 1.39813 | 110.56124 | 106.48043 | 102.99440 | 100.45093 | 99.29359 | 99.09551 | 99.09080 | 99.09080 |
| 10/26/2018 | 10/28/2023    | 10/28/2019     | 0.50800 | 111.23666 | 107.03730 | 103.29493 | 100.28875 | 98.50289 | 97.95453 | 97.85343 | 97.79842 |
| 10/29/2018 | 10/30/2023    | 10/29/2020     | 1.50925 | 108.49725 | 105.36684 | 102.50514 | 100.16850 | 98.59025 | 97.82890 | 97.58507 | 97.52094 |