

Federal Home Loan Bank of Des Moines Monthly Price Report

The Federal Home Loan Bank of Des Moines (Bank) is providing estimated valuations for specific Convertible, Amortizing and Non-Amortizing advances set forth below for members' information and convenience only. The estimated valuations are generated by models used for the Bank's own asset/liability management purposes. The models use 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 prices only and should not be construed as a liquidation price for the specific advance.**

It is expressly understood that in providing these valuations to members, the Bank is not performing any advisory service. The valuations are provided without representation or warranty and the member is solely responsible for any decision it makes or actions it takes based on the valuations provided. It is recommended that members maintain independent capabilities to value their asset/liability positions, including Convertible, Amortizing and Non-Amortizing advances. You should consult with your own tax, legal, accounting, credit and financial advisors with respect to the transaction structure and information detailed herein.

The table depicts valuation estimates resulting from immediate parallel interest-rate movements of plus/minus 400 basis points in 100 basis point increments. To identify your advance, locate the appropriate maturity date and verify the advance rate. The advances in report are grouped by advance type and then within each type sorted in ascending order by maturity date. Once the appropriate structure is located, read across to view the sensitivity analysis for that advance.

If you have any questions, contact the Money Desk at 800.544.3452, ext. 2122.

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
211116A00007	11/16/2021	0.51	11/14/2022	11/16/2021	100.02278	99.98398712	99.94523642	99.906532	99.86787379	99.82926168	99.79069561	99.75217548	99.71370122
211117A00008	11/17/2021	0.5	11/17/2022	11/17/2021	100.02719	99.98008561	99.93303716	99.88604881	99.83912043	99.79225192	99.74544316	99.69869404	99.65200443
211202A00024	12/2/2021	0.61	12/2/2022	12/2/2021	100.05528	99.9666489	99.87817694	99.78986362	99.70170855	99.61371128	99.52587141	99.43818851	99.35066218
211231A00003	12/31/2021	0.59	11/30/2022	12/31/2021	100.05298	99.96988578	99.88692321	99.80409615	99.72140428	99.63884729	99.55642488	99.47413673	99.39198255
220112A00011	1/12/2022	0.79	1/12/2023	1/12/2022	100.09537	99.89347811	99.69241363	99.49216986	99.29274174	99.09412424	98.89631238	98.6993012	98.50308579
220114A00003	1/14/2022	0.76	12/14/2022	1/14/2022	100.07739	99.95556137	99.83404671	99.71284224	99.59194674	99.471359	99.35107781	99.23110198	99.11143031
220125A00012	1/25/2022	0.92	1/20/2023	1/25/2022	100.12381	99.89984593	99.67689336	99.45494586	99.2339966	99.01403883	98.79506582	98.57707095	98.36004763
220225A00009	2/25/2022	1.11	11/2/2022	2/25/2022	100.00637	100.0008217	99.99528262	99.98974828	99.98421869	99.97869384	99.97317373	99.96765836	99.9621477
220317A00002	3/17/2022	1.49	1/17/2023	3/17/2022	100.24648	100.0305884	99.81563674	99.60162064	99.38853393	99.17637051	98.96512434	98.75478943	98.54535985
220322A00009	3/22/2022	1.87	3/22/2023	3/22/2022	100.47697	100.0849554	99.69599955	99.31006888	98.92712812	98.54714255	98.170078	97.79590082	97.42457787
220323A00007	3/23/2022	1.58	12/23/2022	3/23/2022	100.20613	100.0592673	99.91284698	99.76686518	99.62131998	99.4762094	99.33153149	99.18728431	99.04346593
220324A00006	3/24/2022	1.9	3/20/2023	3/24/2022	100.48509	100.0985215	99.71492916	99.33428072	98.95654231	98.58168056	98.20966262	97.84045614	97.47402926
220406A00004	4/6/2022	1.57	11/7/2022	4/6/2022	100.03279	100.0133593	99.99395311	99.97456642	99.95519919	99.93585141	99.91652303	99.89721402	99.87792436
220419A00010	4/19/2022	2.01	2/17/2023	4/19/2022	100.45241	100.1508526	99.85110965	99.55316618	99.25700597	98.962613	98.66997144	98.37906566	98.08988019
220425A00007	4/25/2022	2.34	4/25/2023	4/25/2022	100.76116	100.2757006	99.79491709	99.31873779	98.84709678	98.37992939	97.91717219	97.45876293	97.00464053
220427A00017	4/27/2022	1.86	12/23/2022	4/27/2022	100.24735	100.1004347	99.95396489	99.80793379	99.6623394	99.51717976	99.37245291	99.22815691	99.08428984
220428A00013	4/28/2022	2.04	2/1/2023	4/28/2022	100.41546	100.1579795	99.90181224	99.64695023	99.39338351	99.14110228	98.89009681	98.64035751	98.39187485
220510A00013	5/10/2022	2.03	1/10/2023	5/10/2022	100.34005	100.1433172	99.94736444	99.75218897	99.5577861	99.3641512	99.17127967	98.97916697	98.78780857
220511A00001	5/11/2022	2.38	5/8/2023	5/11/2022	100.81824	100.2972874	99.78171815	99.27144584	98.76638904	98.26646799	97.77160458	97.28172223	96.79674593
220512A00011	5/12/2022	1.8	12/12/2022	5/12/2022	100.19725	100.0808211	99.96467832	99.8488193	99.73324292	99.61794813	99.50293385	99.38819905	99.27374266
220516A00023	5/16/2022	1.73	11/17/2022	5/16/2022	100.08528	100.0381229	99.9910246	99.9439865	99.89700845	99.85009031	99.803232	99.75643338	99.70969434
220518A00016	5/18/2022	2.15	2/17/2023	5/18/2022	100.49477	100.1931291	99.89330354	99.5952778	99.29903569	99.0045612	98.71183848	98.4208519	98.13158601
220518A00017	5/18/2022	2.47	5/18/2023	5/18/2022	100.8963	100.3479699	99.80560161	99.26909547	98.73835661	98.21329227	97.69381167	97.17982594	96.67124811
220524A00011	5/24/2022	2.14	2/24/2023	5/24/2022	100.51593	100.1949902	99.87609531	99.55922861	99.2443708	98.93150282	98.62060588	98.3116614	98.00465103
220531A00018	5/31/2022	1.95	12/30/2022	5/31/2022	100.28903	100.1227272	99.95697153	99.79176257	99.62709764	99.46297409	99.2993893	99.13634065	98.97382554
220531A00022	5/31/2022	2.12	2/28/2023	5/31/2022	100.52139	100.1894709	99.85973348	99.5321574	99.20672149	98.88340491	98.56218706	98.24304764	97.92596659
220601A00021	6/1/2022	2.48	6/1/2023	6/1/2022	100.94526	100.3588367	99.77920785	99.20625758	98.63987103	98.07993597	97.52634271	96.97898402	96.4377551
220601A00027	6/1/2022	2.16	3/1/2023	6/1/2022	100.53728	100.2025886	99.87011663	99.53984392	99.21174877	98.88580975	98.56200571	98.24031576	97.92071931
220602A00050	6/2/2022	2.41	6/2/2023	6/2/2022	100.95943	100.3695986	99.7866449	99.21044903	98.64089401	98.07786555	97.52125196	96.97094409	96.42683524
220608A00010	6/8/2022	2.33	3/8/2023	6/8/2022	100.61565	100.2616125	99.91006951	99.56099545	99.21436428	98.87015035	98.52832836	98.18887338	97.85176083
220614A00010	6/14/2022	3.46	6/14/2023	6/14/2022	101.59682	100.9729571	100.3567653	99.74810071	99.14682573	98.5528062	97.96591118	97.38601283	96.8129864
220615A00001	6/15/2022	2.75	12/16/2022	6/15/2022	100.33437	100.2067125	100.0793965	99.95241894	99.82577835	99.69947338	99.57350268	99.44786487	99.32255862
220616A00037	6/16/2022	3.24	4/14/2023	6/16/2022	101.14164	100.6851139	100.2327124	99.78438255	99.34006952	98.89971933	98.46327902	98.03069655	97.60192081

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220617A00045	6/17/2022	3.13	3/17/2023	6/17/2022	100.94714	100.5676962	100.1911106	99.81735371	99.4463938	99.0781994	98.71273955	98.34998377	97.98990202
220621A00021	6/21/2022	3.31	6/21/2023	6/21/2022	101.5393	100.8966966	100.2622303	99.63574567	99.01709259	98.40612473	97.80269936	97.20667729	96.61792274
220624A00026	6/24/2022	2.81	1/17/2023	6/24/2022	100.53238	100.3160432	100.1006517	99.88619727	99.67267374	99.46007501	99.24839501	99.03762775	98.82776729
220624A00027	6/24/2022	2.96	2/15/2023	6/24/2022	100.72931	100.4327112	100.1378645	99.84475591	99.55337012	99.2636919	98.97570621	98.6893982	98.40475318
220624A00028	6/24/2022	3.05	3/15/2023	6/24/2022	100.90666	100.5327879	100.1616947	99.79334973	99.42772239	99.06478258	98.70450064	98.34684734	97.99179387
220624A00029	6/24/2022	3.13	4/17/2023	6/24/2022	101.10642	100.6418006	100.181454	99.72532414	99.27335312	98.82548412	98.38166136	97.94183008	97.50593648
220624A00030	6/24/2022	2.72	12/27/2022	6/24/2022	100.39874	100.2405915	100.0829423	99.92579301	99.76914126	99.61298474	99.4573211	99.30214803	99.14746321
220701A00031	7/1/2022	2.87	2/1/2023	7/1/2022	100.62977	100.3719235	100.1153905	99.86016414	99.60623453	99.35359184	99.10222635	98.85212843	98.60328855
220701A00032	7/1/2022	2.95	3/1/2023	7/1/2022	100.8026	100.467353	100.1343294	99.80350786	99.47486656	99.14838407	98.82403921	98.5018111	98.18167909
220701A00034	7/1/2022	3.04	3/31/2023	7/1/2022	100.98303	100.5651731	100.1507604	99.73975356	99.33211078	98.92779096	98.52675366	98.1289591	97.73436815
220715A00023	7/15/2022	3.36	3/31/2023	7/15/2022	101.11709	100.698898	100.2841522	99.87281432	99.46484246	99.06019552	98.65883306	98.26071527	97.865803
220720A00031	7/20/2022	3.4	3/20/2023	7/20/2022	101.0678	100.6798493	100.2948838	99.91286998	99.53377385	99.157562	98.78420149	98.4136599	98.04590532
220721A00010	7/21/2022	3.42	4/21/2023	7/21/2022	101.26493	100.7889511	100.3174508	99.85036619	99.38763547	98.92919783	98.47499364	98.02496435	97.5790525
220725A00012	7/25/2022	3.34	3/24/2023	7/25/2022	101.06785	100.6689372	100.2731793	99.88053663	99.49097254	99.10445087	98.72093601	98.34039292	97.96278712
220726A00056	7/26/2022	3.37	4/26/2023	7/26/2022	101.26961	100.7799757	100.2950743	99.81483701	99.33919679	98.86808783	98.40144559	97.93920675	97.48130918
220726A00058	7/26/2022	3.38	7/26/2023	7/26/2022	101.77691	101.0388998	100.3115886	99.59474803	98.88815315	98.19158527	97.50483192	96.82768659	96.15994856
220728A00069	7/28/2022	3.25	7/24/2023	7/28/2022	101.67009	100.9379006	100.2162571	99.50493198	98.80370482	98.11236158	97.43069419	96.75850038	96.0955835
220811A00002	8/11/2022	3.5	8/11/2023	8/11/2022	101.95378	101.1720251	100.4022663	99.64422993	98.89764944	98.1622662	97.43782939	96.72409559	96.0208286
220815A00005	8/15/2022	3.52	8/15/2023	8/15/2022	102.00161	101.2087795	100.4282808	99.65983163	98.9031541	98.1579789	97.42404484	96.70109862	95.98889449
220823A00025	8/23/2022	3.44	2/24/2023	8/23/2022	100.93451	100.6127093	100.2929619	99.97524673	99.65954455	99.34583624	99.03410297	98.72432612	98.41648732
220826A00030	8/26/2022	3.49	3/27/2023	8/26/2022	101.14654	100.739226	100.3351875	99.93438962	99.53679349	99.14236083	98.75105401	98.36283595	97.97767018
220831A00035	8/31/2022	3.65	3/31/2023	8/31/2022	101.23859	100.8200862	100.4050386	99.99340064	99.58513054	99.18018716	98.77853002	98.3801193	97.98491583
220831A00084	8/31/2022	3.84	8/30/2023	8/31/2022	102.35287	101.5182186	100.6971913	99.88945269	99.094682	98.31256861	97.54281176	96.78512017	96.03921164
220901A00003	9/1/2022	3.74	6/1/2023	9/1/2022	101.68912	101.100207	100.5181076	99.9427072	99.37389065	98.81154544	98.2555616	97.70583166	97.16225054
220908A00027	9/8/2022	3.87	7/10/2023	9/8/2022	102.03039	101.3345574	100.6482281	99.97120883	99.30331076	98.64435018	97.99414829	97.35253104	96.71932897
220912A00017	9/12/2022	3.89	6/12/2023	9/12/2022	101.8525	101.2331591	100.621363	100.0169726	99.41985372	98.82987553	98.24691025	97.67083316	97.10152249
220914A00019	9/14/2022	4.25	8/14/2023	9/14/2022	102.57547	101.7828207	101.0024537	100.2340825	99.47743158	98.73223372	97.99822986	97.27516872	96.56280645
220914A00052	9/14/2022	4.29	9/11/2023	9/14/2022	102.8292	101.9600268	101.1055852	100.2655021	99.43941731	98.62698238	97.82786049	97.04172583	96.26826311
220921A00020	9/21/2022	4.38	6/21/2023	9/21/2022	102.23006	101.5849472	100.9479947	100.3190461	99.69795099	99.08456278	98.4787384	97.88033833	97.28922649
220921A00021	9/21/2022	4.47	9/21/2023	9/21/2022	103.07363	102.1763574	101.2947561	100.428415	99.57693983	98.73994962	97.91707643	97.10796469	96.3122707
220921A00025	9/21/2022	4.47	9/21/2023	9/21/2022	103.07363	102.1763574	101.2947561	100.428415	99.57693983	98.73994962	97.91707643	97.10796469	96.3122707
220921A00045	9/21/2022	4.47	9/21/2023	9/21/2022	103.07363	102.1763574	101.2947561	100.428415	99.57693983	98.73994962	97.91707643	97.10796469	96.3122707
220921A00093	9/21/2022	4.44	9/21/2023	9/21/2022	103.13616	102.2373519	101.3542561	100.4864628	99.633576	98.7952135	97.9710059	97.16059632	96.36363979

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220923A00017	9/23/2022	4.41	5/23/2023	9/23/2022	102.00882	101.443336	100.8841326	100.3311063	99.78415503	99.2431789	98.70808024	98.17876348	97.65513511
220923A00019	9/23/2022	4.46	6/23/2023	9/23/2022	102.29846	101.6476709	101.0051792	100.3708256	99.74445584	99.12591974	98.5150708	97.91176615	97.31586645
220923A00020	9/23/2022	4.54	8/23/2023	9/23/2022	102.87773	102.0595625	101.2544442	100.4620652	99.68212445	98.91433024	98.15839996	97.41405971	96.68104398
220926A00030	9/26/2022	4.4	4/26/2023	9/26/2022	101.77521	101.2841235	100.7977828	100.3161162	99.83905656	99.36653803	98.8984959	98.43486675	97.97558834
220926A00031	9/26/2022	4.44	5/26/2023	9/26/2022	102.05139	101.4775967	100.9102623	100.3492805	99.7945448	99.24595126	98.70339816	98.16678601	97.63601752
220926A00032	9/26/2022	4.49	6/26/2023	9/26/2022	102.34337	101.6842809	101.0336901	100.3914377	99.75736386	99.13131295	98.51313326	97.90267685	97.29979952
220926A00033	9/26/2022	4.53	7/26/2023	9/26/2022	102.63032	101.8888089	101.1580341	100.4377653	99.7277769	99.02784961	98.33777041	97.65733225	96.98633383
220926A00034	9/26/2022	4.58	8/28/2023	9/26/2022	102.95537	102.1233668	101.3048392	100.4994661	99.70693187	98.92693084	98.15916711	97.40335398	96.65921366
220926A00036	9/26/2022	4.68	9/26/2023	9/26/2022	103.30909	102.3972032	101.5014699	100.6214596	99.75676037	98.90697452	98.07171809	97.2506202	96.44332252
220927A00037	9/27/2022	4.32	3/31/2023	9/27/2022	101.51927	101.1000728	100.6843277	100.2719966	99.86303749	99.45740921	99.05507126	98.65598378	98.26010755
220927A00066	9/27/2022	4.57	7/27/2023	9/27/2022	102.66882	101.924445	101.1908855	100.467908	99.75528461	99.05279367	98.36021996	97.67735432	97.0039934
220928A00054	9/28/2022	4.66	9/28/2023	9/28/2022	103.30939	102.3921255	101.4911957	100.6061694	99.73662752	98.88216583	98.04239398	97.21693503	96.40542483
220929A00026	9/29/2022	4.43	6/29/2023	9/29/2022	102.3287	101.6615237	101.0030574	100.3531289	99.71157284	99.0782281	98.45293772	97.8355487	97.22591189
221027A00003	10/27/2022	4.92	10/23/2023	10/27/2022	103.79489	102.8079148	101.8397919	100.889987	99.95798273	99.0432811	98.14540252	97.26388502	96.39828341
221021A00020	10/21/2022	4.92	7/21/2023	10/21/2022	102.87084	102.1418865	101.4232999	100.7148588	100.0163489	99.32756206	98.64829586	97.97835349	97.31754355
221019A00032	10/19/2022	4.66	5/15/2023	10/19/2022	102.07705	101.5331684	100.9950949	100.4627412	99.93601618	99.41483071	98.89909749	98.38873108	97.88364779
221004A00029	10/4/2022	4.54	9/28/2023	10/4/2022	103.19921	102.2824853	101.3820955	100.4976024	99.62858722	98.77464576	97.93538784	97.11043663	96.29942811
221004A00031	10/4/2022	4.48	7/28/2023	10/4/2022	102.61035	101.8635122	101.1275637	100.4022692	99.68739862	98.98272805	98.28804012	97.60312359	96.92777314
221024A00016	10/24/2022	4.8	5/24/2023	10/24/2022	102.2389	101.6699395	101.1073297	100.5509609	100.0007294	99.45653411	98.91827578	98.38585751	97.85918449
221012A00047	10/12/2022	4.71	10/12/2023	10/12/2022	103.48113	102.5254047	101.5874074	100.6666438	99.76264111	98.87494376	98.00311261	97.14672417	96.30536991
221028A00039	10/28/2022	4.88	8/2/2023	10/28/2022	102.95805	102.1962254	101.445708	100.7062427	99.97758644	99.25950317	98.55176373	97.85414553	97.16643232
221028A00041	10/28/2022	4.94	10/25/2023	10/28/2022	103.83526	102.8426883	101.8691747	100.9141768	99.97716903	99.05764562	98.15511951	97.26912165	96.39920009
221004A00032	10/4/2022	4.44	6/28/2023	10/4/2022	102.32705	101.6625947	101.0067765	100.3594292	99.72038933	99.08949769	98.46659904	97.85154207	97.2441793
221028A00038	10/28/2022	4.8	5/3/2023	10/28/2022	102.03879	101.5278124	101.0219559	100.5211457	100.0253063	99.53436392	99.04824632	98.56688253	98.09020302
221003A00030	10/3/2022	4.33	4/12/2023	10/3/2022	101.62378	101.1714217	100.7230983	100.2787586	99.83834934	99.40181856	98.96911499	98.54018832	98.11498914
221014A00006	10/14/2022	4.71	7/14/2023	10/14/2022	102.65349	101.9443863	101.2451069	100.555451	99.87522073	99.20422322	98.54227106	97.88918185	97.24477806
221026A00018	10/26/2022	4.78	5/5/2023	10/26/2022	102.04753	101.531056	101.0198169	100.5137351	100.0127325	99.51673292	99.02566157	98.53944515	98.05801183
221004A00034	10/4/2022	4.35	4/28/2023	10/4/2022	101.7675	101.2709726	100.7792908	100.2923834	99.81018124	99.33261625	98.8596218	98.3911325	97.92708422
221020A00038	10/20/2022	4.95	8/21/2023	10/20/2022	103.20171	102.3873893	101.5859671	100.7971396	100.020611	99.25609487	98.50331333	97.76199719	97.03188541
221018A00023	10/18/2022	4.89	10/18/2023	10/18/2022	103.7241	102.7508208	101.7958894	100.8587903	99.93902653	99.03611916	98.14960688	97.27904508	96.42400513
221018A00025	10/18/2022	4.71	6/19/2023	10/18/2022	102.42496	101.7845766	101.1522213	100.5277448	99.91100026	99.30184444	98.70013763	98.10574351	97.51852911
221021A00013	10/21/2022	5.01	9/21/2023	10/21/2022	103.55907	102.6594356	101.7754976	100.9068483	100.0530928	99.2138496	98.38875027	97.57743868	96.77957058
221011A00017	10/11/2022	4.44	5/11/2023	10/11/2022	101.92337	101.3908819	100.8639681	100.342544	99.82652423	99.31582472	98.81036334	98.31005961	97.8148347

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221004A00030	10/4/2022	4.51	8/28/2023	10/4/2022	102.89707	102.0653253	101.2470597	100.4419456	99.64966736	98.86991952	98.10240616	97.34684065	96.60294524
221004A00033	10/4/2022	4.4	5/30/2023	10/4/2022	102.06214	101.4774184	100.8993992	100.3279671	99.76300999	99.20441826	98.65208475	98.10590471	97.5657757
221031A00014	10/31/2022	4.9	6/30/2023	10/31/2022	102.65209	101.9810061	101.3187087	100.665027	100.0197936	99.38284541	98.75402356	98.13317317	97.52014327
221027A00045	10/27/2022	4.83	6/27/2023	10/27/2022	102.57696	101.9142878	101.2601948	100.6145146	99.97708535	99.34774952	98.72635352	98.11274763	97.50678588
221021A00012	10/21/2022	4.92	7/21/2023	10/21/2022	102.87084	102.1418865	101.4232999	100.7148588	100.0163489	99.32756206	98.64829586	97.97835349	97.31754355
221024A00009	10/24/2022	4.98	10/19/2023	10/24/2022	103.82214	102.8456529	101.8876211	100.9475253	100.024864	99.11915452	98.2299317	97.35674733	96.49916934
150601A00342	6/1/2015	3.97	8/26/2033	6/1/2015	115.97665	110.3967529	105.2100947	100.3838963	95.88842378	91.69667864	87.78412505	84.1284459	80.70932476
150601A00439	6/1/2015	2.57	3/18/2024	6/1/2015	101.08629	100.3962479	99.7179364	99.05103586	98.39523698	97.75024216	97.11576495	96.49152945	95.87726983
150601A00440	6/1/2015	3.27	3/16/2029	6/1/2015	107.86881	104.6493854	101.5755061	98.63919853	95.83298409	93.14984865	90.58321052	88.12689084	85.77508613
150601A00450	6/1/2015	3.28	4/27/2029	6/1/2015	108.03892	104.7610394	101.6335537	98.64810487	95.7968667	93.07250493	90.46814313	87.97733096	85.59401481
150601A00460	6/1/2015	3.05	5/16/2029	6/1/2015	107.35904	104.0723432	100.9375377	97.94613082	95.09017117	92.36221009	89.75526648	87.26279428	84.8786523
150601A00506	6/1/2015	3.14	7/6/2029	6/1/2015	107.81425	104.4474125	101.239007	98.18002897	95.26205264	92.4771936	89.81807008	87.27776744	84.84980543
150601A00528	6/1/2015	3.08	7/27/2029	6/1/2015	107.67664	104.2868581	101.0577144	97.98001589	95.04516846	92.24513329	89.5723871	87.01988554	84.58102938
150601A00559	6/1/2015	3.06	8/31/2029	6/1/2015	107.71579	104.2783327	101.0057685	97.88855324	94.91777286	92.08509509	89.3827275	86.8033787	84.34022272
150601A00684	6/1/2015	2.25	2/7/2025	6/1/2015	101.4256	100.2977629	99.19345181	98.11196721	97.05264095	96.01483051	94.99791764	94.00130732	93.02442662
160603A00015	6/3/2016	1.95	6/5/2023	6/3/2016	100.63425	100.0431605	99.45903839	98.88175674	98.31119575	97.74723836	97.18977022	96.63867961	96.09385738
160608A00026	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.004408	98.84196528	95.79968365	92.87229155	90.05478043	87.34238995	84.73059412	82.21508829
160608A00031	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.004408	98.84196527	95.7996836	92.87229146	90.0547803	87.34238979	84.73059393	82.21508807
160608A00032	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.004408	98.84196528	95.79968363	92.87229151	90.05478037	87.34238988	84.73059404	82.21508819
160609A00075	6/9/2016	1.94	6/9/2026	6/9/2016	102.00443	100.1413798	98.33250486	96.57578767	94.86930229	93.21120829	91.59974629	90.03323382	88.51006139
160628A00006	6/28/2016	1.44	6/28/2023	6/28/2016	100.27464	99.9002576	99.5293611	99.1618943	98.79780433	98.43703946	98.07954909	97.72528369	97.37419479
161222A00035	12/22/2016	2.29	12/22/2023	12/22/2016	100.84351	100.2222938	99.61083243	99.00886918	98.41615826	97.83246285	97.25755462	96.6912134	96.13322672
161222A00036	12/22/2016	2.69	12/22/2026	12/22/2016	103.92352	101.813313	99.7705006	97.79236766	95.87632803	94.01991817	92.22079043	90.47670679	88.78553294
161222A00037	12/22/2016	3.08	12/22/2031	12/22/2016	110.30993	105.6578287	101.2918512	97.1910951	93.33636927	89.71003909	86.29588875	83.07899668	80.04562271
170406A00031	4/6/2017	3.01	4/6/2027	4/6/2017	109.46166	105.3888354	101.5005642	97.78741758	94.24049839	90.85140928	87.61222201	84.51544877	81.55401537
170921A00056	9/21/2017	2.82	9/21/2027	9/21/2017	109.53957	105.0987915	100.8764109	96.86040763	93.03948887	89.40303964	85.94107851	82.64421652	79.50361902
180321A00015	3/21/2018	3.02	3/21/2025	3/21/2018	103.04816	101.5914997	100.1689638	98.77948649	97.42204652	96.09566182	94.79938783	93.53231573	92.29357084
180322A00030	3/22/2018	2.79	3/24/2025	3/22/2018	102.46512	101.2133236	99.98860056	98.79013645	97.61714936	96.46888736	95.34462703	94.24367216	93.16535248
180329A00011	3/29/2018	2.77	3/29/2023	3/29/2018	100.57592	100.3251089	100.0758064	99.82799976	99.58167421	99.33681508	99.0934079	98.85143841	98.61089257
180508A00038	5/8/2018	3.57	5/9/2033	5/8/2018	114.8188	109.0425085	103.6772729	98.68885646	94.0461819	89.72101573	85.68768689	81.92283495	78.40518476
201119A00023	11/23/2020	2.23	11/21/2030	11/23/2020	110.37032	102.5211942	95.29298125	88.63324091	82.49421396	76.83238601	71.60809014	66.78514858	62.33054947
220315A00037	3/17/2022	2.63	3/16/2027	3/17/2022	108.6153	104.2517096	100.0895662	96.11854242	92.32889221	88.71141507	85.25742299	81.95870925	78.80751944
200318A00054	3/18/2020	1.56	3/18/2025	3/18/2020	101.58225	99.25478876	96.99199598	94.79172575	92.65191511	90.57058109	88.54581712	86.57578964	84.65873484

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200327A00054	3/27/2020	0.9	3/27/2023	3/27/2020	100.09018	99.68545905	99.28399847	98.88576334	98.49071493	98.09881513	97.71002642	97.32431189	96.94163521
220915A00041	9/15/2022	4.28	5/15/2024	9/15/2022	105.02541	103.481436	101.9679946	100.484247	99.02938744	97.60263906	96.2032524	94.83050428	93.48369657
210706A00014	7/6/2021	1.15	6/26/2026	7/6/2021	101.47815	97.94474265	94.55211311	91.29388164	88.16399489	85.15670823	82.26656795	79.4883947	76.81726794
200325A00044	3/25/2020	1.7	12/23/2024	3/25/2020	101.67125	99.56967953	97.52160906	95.52531031	93.57912066	91.68144413	89.8307482	88.0255607	86.26446691
200327A00068	6/25/2020	0.93	6/26/2023	6/25/2020	99.996014	99.34559586	98.7035997	98.06986323	97.44422796	96.8265394	96.21664698	95.61440392	95.01966708
200421A00020	4/24/2020	0.83	3/15/2024	4/24/2020	99.721879	98.37998229	97.0622845	95.76818893	94.49711757	93.24851083	92.02182677	90.81654046	89.63214328
220512A00007	5/12/2022	2.91	5/13/2024	5/12/2022	102.89265	101.37109	99.87959849	98.41735591	96.9835711	95.57748096	94.19834926	92.84546543	91.51814345
220727A00001	7/27/2022	3.39	7/27/2023	7/27/2022	101.7899	101.0491353	100.3191536	99.5997174	98.89059922	98.19157814	97.50243952	96.82297477	96.15298111
200611A00021	6/11/2020	0.72	6/11/2024	6/11/2020	99.529849	97.95887637	96.41993423	94.9121086	93.43452031	91.98632315	90.56670225	89.17487269	87.81007806
210201A00001	2/1/2021	0.77	12/16/2025	2/1/2021	99.817772	96.80988836	93.90709788	91.10513338	88.39992804	85.78760455	83.26446501	80.82698138	78.47178655
211227A00005	12/27/2021	1.61	12/18/2026	12/27/2021	103.82998	99.80154998	95.95110941	92.26984149	88.74941924	85.3819722	82.16005868	79.07663988	76.12505572
200327A00045	3/27/2020	2.24	3/27/2034	3/27/2020	112.68417	101.7786045	92.04667956	83.35523461	75.58686224	68.63797158	62.41710056	56.84344166	51.84555317
210121A00018	1/25/2021	0.5	8/25/2023	1/25/2021	99.563723	98.75509371	97.9595158	97.17667515	96.40626802	95.64800028	94.90158699	94.16675206	93.44322794
220525A00020	5/25/2022	2.79	5/24/2024	5/25/2022	102.76743	101.2179002	99.69930784	98.21079428	96.75153254	95.32072564	93.91760518	92.54143005	91.19148528
220909A00017	9/9/2022	3.85	9/9/2024	9/9/2022	105.38308	103.5219563	101.7029786	99.92494294	98.18669131	96.48710563	94.82510627	93.19965046	91.60973079
210929A00012	3/16/2022	1.03	3/14/2025	3/16/2022	100.31572	98.01375157	95.77557655	93.59908768	91.48225679	89.42313402	87.41984432	85.47058411	83.5736182
220601A00023	6/1/2022	2.9	6/3/2024	6/1/2022	102.99962	101.4215899	99.87536948	98.36006678	96.87481931	95.41879638	93.99119765	92.59125174	91.21821487
200331A00018	3/31/2020	0.82	3/31/2023	3/31/2020	100.05299	99.63745638	99.22535451	98.81664453	98.41128478	98.00923431	97.61045283	97.21490068	96.82253886
201216A00004	12/16/2020	0.74	9/8/2025	12/16/2020	99.658398	96.90692057	94.24450269	91.66780833	89.1736439	86.75895182	84.42080397	82.1563955	79.96303899
221027A00046	10/27/2022	4.92	10/27/2023	10/27/2022	103.83594	102.8379799	101.8592856	100.8993026	99.95749697	99.03335512	98.12638259	97.23610325	96.36205845
200826A00036	8/28/2020	0.88	7/28/2023	8/28/2020	99.918961	99.18322461	98.45826435	97.74384544	97.03973945	96.34572452	95.6615851	94.98711174	94.32210086
210407A00013	4/7/2021	1.23	4/7/2026	4/7/2021	101.54284	98.21524194	95.01359623	91.93248783	88.96676569	86.11152618	83.36209987	80.7140391	78.16310618
210914A00011	9/16/2021	0.52	9/18/2023	9/16/2021	99.529018	98.65695985	97.80008269	96.95799333	96.13031175	95.31667089	94.51671605	93.73010438	92.9565044
210928A00008	9/28/2021	1.35	9/28/2026	9/28/2021	102.50273	98.70927783	95.07603985	91.59545062	88.26033665	85.06389803	81.99968704	79.06158809	76.24379887
220325A00019	3/28/2022	2.86	3/23/2027	3/28/2022	109.66419	105.2596811	101.0590191	97.05171975	93.22789143	89.57819822	86.09382604	82.76645084	79.58820885
200415A00003	4/15/2020	0.77	4/14/2023	4/15/2020	100.0112	99.55773212	99.10837616	98.66307193	98.22176472	97.78440083	97.35092748	96.92129285	96.49544605
200427A00018	4/27/2020	1.51	4/27/2028	4/27/2020	104.64885	99.32721699	94.30760372	89.57135015	85.10103984	80.88041265	76.89428227	73.12846	69.56968432
200916A00023	9/16/2020	0.42	9/16/2024	9/16/2020	99.213406	97.38857066	95.60575126	93.8637373	92.16136122	90.49749628	88.87105489	87.28098693	85.72627826
220518A00009	5/18/2022	3.38	5/18/2028	5/18/2022	114.97389	109.3183049	103.981826	98.94470995	94.18854156	89.69613333	85.45143741	81.43946422	77.64620724
200310A00040	3/10/2020	1.36	3/10/2028	3/10/2020	103.78414	98.60644455	93.71639166	89.09659516	84.73080359	80.60382021	76.7014295	73.01032919	69.5180673
200320A00013	3/20/2020	1.25	3/20/2024	3/20/2020	100.46752	99.10467797	97.7666545	96.4528336	95.1626167	93.89542452	92.65069628	91.42788898	90.22647672
200708A00011	7/10/2020	2.87	7/10/2031	7/10/2020	115.92289	107.2803857	99.36326631	92.10649011	85.45117555	79.34398897	73.7365948	68.58516299	63.84992735
210611A00006	6/11/2021	1.85	6/11/2031	6/11/2021	107.26167	99.05016553	91.53093111	84.64197575	78.32715925	72.53561116	67.22121144	62.3421247	57.86038232

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
211206A00008	12/6/2021	1.24	12/6/2024	12/6/2021	100.65594	98.60938216	96.6141964	94.66875064	92.77147569	90.92086384	89.11546598	87.35388879	85.63479217
220722A00049	9/15/2022	3.25	9/15/2025	9/15/2022	106.88073	104.0064008	101.2248184	98.53250323	95.92612224	93.4024849	90.9585365	88.59135151	86.29812743
200305A00039	3/5/2020	1.58	3/5/2030	3/5/2020	105.43444	98.40190714	91.88529783	85.8441972	80.24154535	75.04334284	70.21838405	65.73801496	61.57591305
210729A00006	7/29/2021	1.87	11/30/2032	7/29/2021	107.11071	97.66801749	89.14097289	81.4358564	74.46898943	68.16560927	62.4588787	57.28900993	52.60248942
211117A00017	11/17/2021	0.49	11/17/2022	11/17/2021	100.02672	99.97961376	99.93256572	99.88557777	99.8386498	99.79178169	99.74497333	99.69822461	99.65153541
211213A00011	12/13/2021	1.32	12/13/2024	12/13/2021	100.83619	98.76960051	96.75520707	94.79133408	92.87637564	91.00878941	89.18709353	87.40986379	85.67573084
220331A00010	3/31/2022	2.83	2/18/2026	3/31/2022	106.69416	103.4060239	100.237123	97.18248388	94.23736998	91.39726841	88.65787789	86.01509761	83.46501661
220727A00009	7/27/2022	3.31	7/28/2025	7/27/2022	106.69738	103.9556042	101.2986809	98.7234319	96.22681825	93.80593692	91.45801375	89.18039664	86.97054914
200324A00029	3/24/2020	1.86	3/24/2025	3/24/2020	102.31505	99.96331729	97.67727396	95.4547225	93.29355598	91.19174966	89.14735734	87.15850777	85.22340135
210309A00004	3/11/2021	0.87	11/25/2024	3/11/2021	99.869293	97.85992253	95.90055045	93.98960605	92.12557935	90.30701867	88.53252784	86.80076374	85.11043376
200220A00013	2/20/2020	2.09	12/14/2029	2/20/2020	109.02356	102.0684486	95.60697773	89.60151416	84.01748434	78.82310694	73.98915371	69.48873183	65.29708605
201201A00002	12/1/2020	0.54	12/1/2023	12/1/2020	99.417643	98.35117803	97.30739346	96.28557323	95.28503079	94.30510797	93.34517343	92.40462138	91.48287027
201210A00021	12/10/2020	0.89	12/10/2027	12/10/2020	101.97542	97.05229779	92.39273758	87.98130024	83.80353203	79.84589573	76.09570759	72.54107901	69.17086246
210211A00005	2/11/2021	0.45	6/15/2023	2/11/2021	99.709117	99.08925481	98.47706805	97.87241499	97.27515719	96.68515958	96.10229035	95.52642089	94.95742564
220317A00026	5/3/2022	2.59	5/3/2027	5/3/2022	108.68899	104.1987511	99.92152918	95.84610174	91.96189318	88.25893722	84.72783856	81.35973718	78.14627502
200818A00018	3/31/2021	0.57	4/1/2024	3/31/2021	99.335282	97.95244222	96.59527802	95.26313852	93.95539391	92.67143501	91.41067244	90.17253584	88.95647307
210208A00004	2/11/2021	0.76	10/15/2025	2/11/2021	99.733833	96.88648768	94.13432876	91.4736712	88.90099332	86.41292874	84.00625864	81.67790438	79.42492062
210225A00006	2/25/2021	0.98	2/25/2026	2/25/2021	100.61128	97.40410355	94.31483453	91.33854415	88.47053361	85.70632429	83.04164615	80.47242695	77.99478199
210907A00010	9/7/2021	2.58	9/7/2040	9/7/2021	115.04592	99.2907764	86.0069253	74.7866626	65.29178479	57.24142447	50.40206451	44.579333	39.61125474
220408A00014	4/8/2022	3.12	6/29/2026	4/8/2022	108.68151	105.0086789	101.4810215	98.0919784	94.835325	91.7051537	88.69585589	85.8021049	83.01883997
220712A00006	7/12/2022	3.36	7/12/2024	7/12/2022	104.02866	102.3366311	100.6802202	99.05836733	97.47005353	95.91430009	94.39016655	92.89674878	91.43317723
210420A00010	4/20/2021	1.08	12/12/2025	4/20/2021	100.77945	97.76664992	94.85869398	92.05134232	89.34055109	86.7224642	84.1934033	81.7498584	79.38847902
200415A00020	4/15/2020	0.86	4/15/2024	4/15/2020	99.745977	98.32290424	96.92694326	95.55738807	94.21355673	92.89479029	91.60045181	90.32992544	89.08261559
220601A00024	6/1/2022	3.09	6/2/2025	6/1/2022	105.72152	103.1423553	100.6396076	98.21054934	95.8525686	93.56316338	91.33993647	89.18059019	87.08292154
220727A00049	7/27/2022	3.31	7/25/2025	7/27/2022	106.67611	103.9424905	101.2932722	98.72529978	96.23555786	93.8211656	91.47936967	89.2075375	87.00315101
200316A00019	3/16/2020	1.11	3/16/2023	3/16/2020	100.17955	99.80462436	99.43250728	99.06316916	98.69657886	98.33270569	97.97151945	97.61299035	97.25708907
200310A00033	3/10/2020	0.91	3/10/2025	3/10/2020	100.33159	98.03334737	95.79865417	93.62541233	91.51160626	89.45529796	87.45462363	85.50779035	83.613073
200417A00008	4/17/2020	0.96	4/17/2025	4/17/2020	100.16916	97.78131462	95.46206173	93.20904983	91.02002067	88.89280663	86.82532656	84.81558177	82.86165219
200415A00037	4/15/2020	0.97	4/15/2025	4/15/2020	100.19234	97.8094381	95.49483675	93.24620066	91.06128595	88.9379386	86.87409031	84.86775452	82.91702267
200521A00016	5/21/2020	2.18	5/21/2037	5/21/2020	110.89226	97.74166024	86.33767988	76.43678886	67.8306308	60.34078823	53.81434641	48.12013322	43.14552933
220314A00009	3/14/2022	2.38	7/28/2025	3/14/2022	104.14622	101.4397575	98.81732035	96.27575289	93.81204138	91.42330718	89.10679955	86.85988887	84.68006032
220812A00014	8/12/2022	3.54	8/12/2024	8/12/2022	104.58032	102.8014942	101.0615451	99.35932427	97.69372716	96.06369135	94.46819463	92.90625303	91.37691905
200311A00031	3/11/2020	1.41	12/24/2027	3/11/2020	103.93064	98.94657943	94.22954889	89.76386483	85.53484887	81.52875686	77.73271428	74.13465653	70.72327365

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
201015A00003	10/15/2020	0.75	10/15/2025	10/15/2020	99.704261	96.85735599	94.10562637	91.44538755	88.87311819	86.38545224	83.9791712	81.65119674	79.39858381
210324A00002	3/24/2021	2.06	3/24/2031	3/24/2021	109.04107	100.9441774	93.51296182	86.68919736	80.42002516	74.65743589	69.35780278	64.48146169	59.99233331
220526A00011	5/26/2022	3.29	5/24/2029	5/26/2022	116.50467	109.8210277	103.5741657	97.73312635	92.26930414	87.15625528	82.36952367	77.88648157	73.68618391
200324A00031	3/24/2020	1.64	3/22/2024	3/24/2020	100.84998	99.48181088	98.13860341	96.81973336	95.5245976	94.25261245	93.00321289	91.77585185	90.56999951
220426A00004	4/26/2022	3.41	4/26/2032	4/26/2022	121.44713	111.8473518	103.1122201	95.15856659	87.91164256	81.30422988	75.27584692	69.77204166	64.74376219
220825A00006	8/25/2022	3.56	8/25/2027	8/25/2022	113.99489	109.079987	104.4099764	99.97136025	95.75145306	91.73832944	87.92077477	84.28823915	80.83079468
201223A00013	12/23/2020	0.9	12/11/2026	12/23/2020	100.89399	96.94342783	93.16749422	89.55755357	86.10544908	82.80346981	79.64432367	76.62111224	73.72730721
220224A00018	2/24/2022	2.15	3/16/2026	2/24/2022	104.5873	101.2643547	98.06464174	94.98296381	92.01436744	89.15413286	86.39776172	83.74096554	81.17965478
220420A00037	6/15/2022	3.3	6/15/2027	6/15/2022	112.21333	107.5293085	103.0710674	98.82648598	94.78416514	90.93337653	87.2640191	83.76657893	80.43209178
210304A00006	3/4/2021	1.02	3/4/2026	3/4/2021	100.75944	97.53130103	94.42245726	91.42790465	88.54287709	85.76283154	83.08343643	80.50056074	78.01026363
220114A00010	1/14/2022	1.86	1/13/2027	1/14/2022	104.97336	100.8548176	96.92052567	93.16123828	89.56822491	86.13324118	82.84849882	79.70663757	76.70069908
200402A00044	4/2/2020	1.65	4/2/2030	4/2/2020	105.92852	98.81173868	92.22158777	86.11644132	80.45816401	75.21179827	70.34528487	65.82920934	61.63657176
200415A00027	4/15/2020	0.86	4/15/2024	4/15/2020	99.745977	98.32290424	96.92694326	95.55738807	94.21355673	92.89479029	91.60045181	90.32992544	89.08261559
200528A00021	5/28/2020	0.63	5/26/2023	5/28/2020	99.865249	99.29861014	98.73837495	98.18443522	97.63668533	97.09502202	96.55934431	96.02955346	95.50555288
210917A00003	9/17/2021	0.8	9/17/2024	9/17/2021	99.691999	97.8642965	96.07863757	94.33381181	92.6286513	90.96202896	89.3328568	87.74008432	86.18269698
220907A00023	9/7/2022	3.76	9/8/2026	9/7/2022	111.7011	107.7831911	104.0265853	100.4238031	96.96775093	93.65169859	90.46925877	87.41436781	84.48126768
200406A00053	4/6/2020	1.13	4/7/2025	4/6/2020	100.57669	98.20997216	95.91047493	93.6759204	91.50411949	89.39296996	87.34045238	85.34462639	83.40362711
220929A00043	9/29/2022	4.44	9/28/2029	9/29/2022	124.96342	117.6638946	110.858206	104.5100785	98.58608766	93.05542032	87.88965824	83.06258028	78.54998203
200302A00056	3/2/2020	1.2	3/2/2023	3/2/2020	100.21478	99.87802439	99.54352692	99.21126333	98.88121133	98.55334894	98.22765444	97.90410642	97.58268373
200330A00037	3/30/2020	1.09	3/28/2025	3/30/2020	100.46928	98.12986463	95.85619966	93.64607872	91.49738306	89.40807696	87.37620399	85.3998834	83.47730677
201015A00024	10/19/2020	1.53	10/18/2027	10/19/2020	104.40006	99.57533347	95.00113669	90.66319878	86.54813454	82.6433837	78.93715585	75.41837947	72.0766545
210208A00006	2/9/2021	0.46	8/15/2023	2/9/2021	99.562226	98.78006757	98.01012747	97.25212166	96.5057744	95.7708184	95.04699448	94.33405127	93.63174494
220727A00035	10/24/2022	3.33	10/24/2029	10/24/2022	117.50077	110.3857908	103.7614463	97.59116784	91.84129854	86.48084483	81.48125287	76.8162047	72.46143248
220217A00011	2/17/2022	2.08	2/14/2025	2/17/2022	102.69571	100.4413469	98.24743533	96.11197233	94.03303568	92.00878024	90.03743425	88.11729581	86.24672957
220527A00014	5/27/2022	2.99	5/27/2026	5/27/2022	107.94996	104.3795869	100.9476744	97.64808625	94.47499827	91.42287604	88.48645883	85.66074439	82.9409747
210305A00006	3/8/2021	1.02	8/11/2025	3/8/2021	100.42875	97.73804926	95.13228466	92.6082656	90.16294608	87.7934142	85.49688526	83.27069524	81.11229464
210624A00025	6/24/2021	1.43	6/24/2027	6/24/2021	103.68709	99.17289764	94.8799111	90.796133	86.91028306	83.21175033	79.6905497	76.3372814	73.1430934
220510A00015	5/13/2022	3.13	11/3/2025	5/13/2022	106.87338	103.8700242	100.9677099	98.16247603	95.45054123	92.82829344	90.2922814	87.83920646	85.46591491
220916A00045	9/16/2022	4.1	9/16/2032	9/16/2022	130.03983	119.6077455	110.1417472	101.5460759	93.73496017	86.63153046	80.16685336	74.27907441	68.91265758
211214A00014	12/14/2021	1.31	12/13/2024	12/14/2021	100.81492	98.74856585	96.73439837	94.77074685	92.85600552	90.98863214	89.16714499	87.39011997	85.65618784
210224A00002	2/25/2021	0.88	11/3/2025	2/25/2021	100.10398	97.20307484	94.40063739	91.69279082	89.0758358	86.5462391	84.10062501	81.73576746	79.4485824
220603A00024	6/3/2022	2.94	6/3/2024	6/3/2022	103.06363	101.485069	99.9383278	98.42251343	96.93676316	95.48024608	94.05216162	92.65173817	91.27823174
200309A00007	3/9/2020	1.11	3/9/2027	3/9/2020	101.93928	97.73910643	93.73386263	89.91354675	86.26872296	82.79048298	79.47041393	76.30056837	73.27343629

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200327A00042	3/27/2020	0.83	3/27/2024	3/27/2020	99.876635	98.50003203	97.14880411	95.82231224	94.51993797	93.24108301	91.98516841	90.75163376	89.53993651
201118A00021	11/20/2020	0.97	11/20/2023	11/20/2020	99.88925	98.84904647	97.83036285	96.83253743	95.8549351	94.89694633	93.95798584	93.03749145	92.1349229
220315A00018	3/15/2022	2.43	3/15/2027	3/15/2022	107.69423	103.354485	99.21518784	95.26606783	91.49742753	87.90011232	84.4654773	81.18535636	78.05203327
200330A00006	3/30/2020	0.9	3/28/2025	3/30/2020	100.31906	97.97504335	95.69703622	93.48282435	91.33027683	89.23734644	87.20206585	85.22254398	83.29696259
211028A00019	10/28/2021	1.1	10/28/2024	10/28/2021	100.3071	98.36745906	96.47487004	94.62790222	92.82517815	91.06537146	89.34720453	87.66944641	86.03091073
220425A00027	4/29/2022	3.15	8/20/2026	4/29/2022	109.20366	105.384275	101.7207332	98.20583991	94.8327735	91.59506269	88.48656679	85.5014569	82.63419825
200427A00017	4/27/2020	1.02	4/25/2025	4/27/2020	100.32417	97.91344845	95.57256096	93.29908846	91.09071262	88.94520914	86.8604432	84.83436538	82.86500763
220304A00004	3/4/2022	2.12	12/29/2028	3/4/2022	108.60623	102.5484925	96.86883996	91.54169214	86.54332747	81.85174189	77.44651559	73.30869075	69.42065948
220915A00025	9/15/2022	4.34	9/15/2023	9/15/2022	102.90637	102.0260556	101.1608479	100.3103566	99.47420788	98.65204062	97.84350562	97.04826527	96.26599303
210616A00008	5/2/2022	0.95	5/2/2025	5/2/2022	100.15477	97.72799643	95.37201401	93.08435084	90.86264051	88.70461332	86.60809165	84.57098565	82.59128909
221031A00036	10/31/2022	4.59	10/29/2027	10/31/2022	119.61477	114.3880458	109.4286638	104.7214699	100.2522472	96.00765456	91.97516831	88.14302766	84.50018444
200310A00015	3/10/2020	1.37	3/11/2030	3/10/2020	103.90654	96.91433291	90.43730587	84.43497234	78.87021843	73.70900338	68.92009123	64.47480702	60.34681532
201117A00016	11/17/2020	0.52	11/18/2024	11/17/2020	99.404046	97.41317008	95.47165428	93.57795645	91.73059435	89.92814254	88.16922969	86.45253614	84.77679155
210104A00007	11/23/2021	0.88	11/23/2026	11/23/2021	100.77672	96.8744887	93.14312015	89.57425451	86.15998249	82.89282244	79.76569477	76.77189809	73.90508692
220419A00016	4/19/2022	3.21	4/19/2027	4/19/2022	111.35932	106.8470944	102.5464858	98.44645019	94.53657748	90.8070519	87.24861482	83.85253024	80.61055259
200305A00030	3/5/2020	1.58	3/5/2030	3/5/2020	105.43444	98.40190714	91.88529783	85.8441972	80.24154535	75.04334284	70.21838405	65.73801496	61.57591305
200414A00014	4/14/2020	0.76	4/12/2024	4/14/2020	99.771934	98.35382411	96.96262574	95.5976409	94.25819533	92.94363742	91.65333725	90.38668572	89.14309365
201029A00002	10/29/2020	0.59	10/29/2025	10/29/2020	99.610887	96.72129812	93.92968591	91.23220258	88.62517375	86.10508956	83.66859628	81.31248845	79.03370139
210629A00012	6/29/2021	1.14	12/29/2025	6/29/2021	100.99909	97.93954895	94.98766536	92.13902984	89.38944272	86.73490213	84.17159327	81.69587839	79.30428731
220412A00017	4/12/2022	3.09	3/19/2027	4/12/2022	110.64045	106.2251457	102.0134606	97.99495236	94.15976703	90.49860286	87.00267667	83.66369231	80.47381119
220418A00015	4/22/2022	3.03	7/28/2025	4/22/2022	105.92929	103.198145	100.5516046	97.98649629	95.49978866	93.08858603	90.7501213	88.48174914	86.28093961
220425A00026	4/25/2022	3.13	2/25/2026	4/25/2022	107.74287	104.4170589	101.2123567	98.1237235	95.14635287	92.27566306	89.50728532	86.8370528	84.2609901
210224A00004	2/26/2021	0.91	12/18/2025	2/26/2021	100.25788	97.2380122	94.32373183	91.51074923	88.7949739	86.17250626	83.63962741	81.19278956	78.82860697
220311A00008	3/11/2022	2.07	3/11/2024	3/11/2022	101.42527	100.0814539	98.76169574	97.46540272	96.1920034	94.94094445	93.71168991	92.50372055	91.31653319
200305A00032	3/5/2020	1.58	3/5/2030	3/5/2020	105.43444	98.40190714	91.88529783	85.8441972	80.24154535	75.04334284	70.21838405	65.73801496	61.57591305
200403A00018	4/3/2020	0.91	4/3/2024	4/3/2020	99.820631	98.42886195	97.06302679	95.72246522	94.40653865	93.11462949	91.84614034	90.60049314	89.37712838
200225A00034	10/5/2020	1.5	10/5/2023	10/5/2020	100.40423	99.48293382	98.57846479	97.69036583	96.8181958	95.96152925	95.11995579	94.29307937	93.48051772
200317A00027	3/17/2020	1.29	3/17/2025	3/17/2020	100.93699	98.6198811	96.36714136	94.17663183	92.04630074	89.97417578	87.95836055	85.99703119	84.08843317
220412A00016	4/12/2022	3.09	3/19/2027	4/12/2022	110.64045	106.2251457	102.0134606	97.99495236	94.15976703	90.49860286	87.00267667	83.66369231	80.47381119
200429A00054	4/29/2020	1.04	4/29/2025	4/29/2020	100.37766	97.95580005	95.6043892	93.32097702	91.10321508	88.94885058	86.85572183	84.82175397	82.8449549
211213A00010	12/13/2021	1.02	12/13/2023	12/13/2021	99.946254	98.84507511	97.76799636	96.71423348	95.68303625	94.6736863	93.68549547	92.71780421	91.76998016
220421A00016	4/21/2022	3.31	4/21/2026	4/21/2022	108.78945	105.2996541	101.942071	98.71097957	95.60094013	92.60677679	89.7235631	86.9466086	84.27144626
200406A00060	4/6/2020	1.03	4/5/2024	4/6/2020	99.993099	98.59472194	97.22249739	95.8757571	94.55385471	93.25616522	91.98208413	90.73102659	89.50242662

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210907A00015	9/9/2021	2.21	9/9/2026	9/9/2021	105.74851	101.94221	98.29396933	94.79642635	91.44260059	88.22587017	85.1399515	82.17888026	79.3369936
211209A00007	12/9/2021	1.61	12/8/2026	12/9/2021	103.79209	99.79001502	95.96382732	92.30486716	88.80494715	85.45632603	82.2516818	79.18408651	76.24698288
220112A00008	1/12/2022	1.47	11/20/2024	1/12/2022	101.10338	99.0943061	97.13494871	95.22375377	93.35922844	91.53993708	89.7644986	88.03158401	86.33991396
220706A00032	7/6/2022	3.15	7/6/2027	7/6/2022	112.36394	107.5988775	103.0664349	98.75397309	94.64961072	90.74217459	87.02115351	83.47665513	80.09936594
220711A00021	7/11/2022	3.27	7/11/2025	7/11/2022	106.82519	104.118452	101.4944888	98.95023974	96.48277741	94.08930334	91.76714136	89.5137312	87.32662259
220812A00002	8/12/2022	3.17	8/12/2027	8/12/2022	112.73509	107.8629667	103.2330173	98.83188569	94.64702862	90.66665847	86.87969358	83.27571205	79.84490871
210330A00021	3/30/2021	2.16	3/28/2031	3/30/2021	109.86438	101.7247693	94.25432194	87.39447602	81.09207171	75.29883004	69.97088243	65.06834778	60.55495192
220420A00061	6/15/2022	3.3	6/15/2027	6/15/2022	112.21333	107.5293085	103.0710674	98.82648598	94.78416514	90.93337653	87.2640191	83.76657893	80.43209178
220308A00011	3/8/2022	2.07	1/10/2025	3/8/2022	102.5337	100.3758895	98.27390067	96.22588644	94.23008019	92.28478789	90.38838447	88.53931031	86.7360681
220314A00006	3/14/2022	2.36	3/14/2025	3/14/2022	103.4732	101.1331929	98.85779327	96.64486957	94.49237026	92.39832299	90.36083106	88.37807011	86.44828487
200310A00038	3/10/2020	1.41	3/11/2030	3/10/2020	104.19682	97.19425404	90.70739818	84.69574001	79.1221347	73.95251273	69.15561132	64.70273052	60.56751163
200413A00003	4/13/2020	0.64	4/13/2023	4/13/2020	99.993995	99.54281918	99.09571173	98.65261768	98.21348304	97.77825482	97.34688096	96.91931031	96.49549266
210706A00006	7/6/2021	1.15	7/6/2026	7/6/2021	101.50459	97.94504276	94.52818406	91.2475089	88.0968444	85.07033483	82.16242318	79.36783401	76.68155731
211014A00018	10/14/2021	0.8	10/11/2024	10/14/2021	99.951795	98.05447402	96.20227039	94.39384056	92.62788997	90.90317102	89.21848097	87.57266008	85.96458969
220614A00011	6/14/2022	3.71	6/14/2024	6/14/2022	104.40595	102.7858288	101.1987365	99.64373125	98.11990346	96.62637755	95.16231063	93.72689091	92.31933626
220711A00009	7/11/2022	3.36	7/11/2023	7/11/2022	101.6799	100.9827266	100.2951215	99.61688554	98.94782795	98.28776306	97.63651021	96.99389358	96.35974196
221028A00027	10/28/2022	4.73	10/28/2024	10/28/2022	107.57165	105.5576788	103.5922002	101.6737459	99.80089914	97.97229569	96.18662152	94.44261057	92.73904262
201028A00013	10/28/2020	0.68	10/28/2024	10/28/2020	99.466573	97.53553281	95.65137729	93.81268063	92.01806994	90.2662232	88.55586703	86.88577452	85.25476324
221021A00026	10/21/2022	4.94	10/23/2023	10/21/2022	103.81463	102.8275477	101.8593216	100.9094148	99.97731004	99.06250921	98.16453271	97.28291855	96.41722151
200318A00037	3/18/2020	1.35	3/18/2024	3/18/2020	100.44179	99.08694384	97.7566475	96.45029573	95.16729905	93.90708684	92.66910661	91.4528233	90.25771857
220209A00013	2/9/2022	1.98	7/29/2025	2/9/2022	103.05243	100.3585339	97.74845672	95.21904318	92.76728265	90.39029966	88.08534668	85.84979731	83.68113998
220317A00010	3/17/2022	2.04	9/15/2023	3/17/2022	100.87669	100.0061125	99.15051744	98.3095235	97.48275922	96.66986562	95.87049573	95.08431406	94.31099616
220317A00023	5/3/2022	2.52	5/2/2025	5/3/2022	104.09099	101.6142609	99.20942485	96.87398248	94.60553484	92.401781	90.2605133	88.17961298	86.15704599
200304A00019	3/4/2020	1.04	3/6/2023	3/4/2020	100.15846	99.8108975	99.46574193	99.12297268	98.78256503	98.4444946	98.10873734	97.77526953	97.44406779
200327A00035	3/27/2020	0.83	3/27/2024	3/27/2020	99.876635	98.50003203	97.14880411	95.82231224	94.51993797	93.24108301	91.98516841	90.75163376	89.53993651
200415A00023	4/15/2020	1.71	4/15/2030	4/15/2020	106.36473	99.20044535	92.56835772	86.42622546	80.73536237	75.46032017	70.56860244	66.03040526	61.81838164
220412A00010	4/12/2022	3.09	3/15/2027	4/12/2022	110.56565	106.1637364	101.964354	97.95714008	94.13231472	90.48064472	86.99341042	83.66237455	80.47975311
201021A00012	10/21/2020	1.85	10/19/2035	10/21/2020	106.76247	95.06187576	84.77671013	75.72746019	67.7582315	60.7335385	54.53554334	49.06167984	44.22260732
200304A00022	3/4/2020	0.86	3/6/2023	3/4/2020	100.12683	99.77898341	99.4335526	99.09051429	98.74984363	98.4115161	98.07550754	97.7417941	97.41035227
210729A00003	7/29/2021	1.11	7/29/2026	7/29/2021	101.413	97.79705354	94.32814773	90.99947347	87.8045803	84.73735483	81.79200077	78.96302035	76.24519688
220325A00010	3/28/2022	2.78	3/21/2025	3/28/2022	104.50801	102.1373588	99.83255153	97.59139868	95.41179609	93.29172148	91.22923073	89.22245435	87.26959421
200220A00014	2/20/2020	2.09	12/21/2029	2/20/2020	109.03198	102.0593513	95.58272197	89.56420177	83.96898182	78.76507079	73.92305291	69.41586804	65.2186115
200302A00002	3/2/2020	1.12	3/3/2025	3/2/2020	100.82011	98.53392014	96.31045752	94.14766358	92.04356311	89.99625636	88.00391574	86.06478265	84.17716447

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200306A00055	3/6/2020	0.82	3/6/2025	3/6/2020	100.11697	97.83150744	95.60899873	93.44737167	91.34463739	89.29888328	87.30826961	85.37102633	83.48545003
200521A00013	5/21/2020	2.09	5/21/2035	5/21/2020	109.67087	98.11157821	87.90590303	78.88720084	70.91015335	63.84794289	57.58981433	52.0389688	47.11074256
210518A00023	5/18/2021	1.17	5/18/2026	5/18/2021	101.44209	98.01065195	94.71277373	91.54255121	88.49437106	85.56289824	82.74306061	80.03003438	77.41923052
220420A00034	6/15/2022	3.3	6/15/2027	6/15/2022	112.21333	107.5293085	103.0710674	98.82648598	94.78416514	90.93337653	87.2640191	83.76657893	80.43209178
200415A00036	4/15/2020	0.91	10/15/2024	4/15/2020	99.920181	98.01763383	96.16048714	94.34738406	92.57701715	90.84812654	89.15949787	87.50996031	85.89838471
200402A00041	4/2/2020	1.03	4/2/2025	4/2/2020	100.32825	97.97769893	95.69357152	93.47362358	91.31570373	89.21774539	87.17776291	85.1938479	83.26416578
200327A00055	3/27/2020	1.01	3/27/2024	3/27/2020	99.965276	98.59070302	97.24142815	95.91681451	94.61624634	93.33912786	92.08488254	90.85295227	89.64279666
200306A00013	3/6/2020	1.01	3/6/2025	3/6/2020	100.26364	97.98262642	95.76431854	93.60665463	91.50765707	89.46542391	87.47812556	85.54400155	83.66135758
201223A00012	12/23/2020	0.91	12/18/2026	12/23/2020	100.94825	96.97894826	93.18574051	89.55989133	86.09314621	82.77770371	79.60618794	76.5716228	73.66740803
220106A00010	1/6/2022	2.64	1/6/2037	1/6/2022	117.04914	103.7674781	92.19535091	82.10072771	73.28428672	65.57465167	58.82434389	52.90633847	47.71113175
220714A00034	7/14/2022	3.62	1/16/2024	7/14/2022	103.12535	101.9143235	100.7317848	99.57673772	98.44823065	97.34535536	96.2672447	95.2130703	94.18204038
221025A00027	10/25/2022	4.57	10/25/2027	10/25/2022	119.47466	114.2621323	109.3157302	104.6203961	100.1620037	95.92729525	91.90382336	88.07989759	84.44453439
210201A00003	2/2/2021	0.74	10/15/2025	2/2/2021	99.674689	96.8282243	94.07692399	91.4171039	88.84524306	86.35797575	83.95208377	81.62448911	79.372247
201117A00017	11/17/2020	0.39	11/17/2023	11/17/2020	99.390612	98.35948756	97.34957941	96.36023862	95.39084255	94.4407935	93.50951741	92.59646272	91.70109931
220823A00034	8/23/2022	3.61	8/23/2024	8/23/2022	104.79494	102.9850279	101.2152196	99.48436773	97.79136256	96.13513428	94.51465111	92.92891765	91.37697332
200429A00066	4/29/2020	0.8	4/28/2023	4/29/2020	100.00526	99.51383056	99.02720678	98.54532184	98.06810688	97.59549433	97.12741795	96.66381275	96.20461497
210224A00003	2/26/2021	0.9	12/3/2025	2/26/2021	100.20739	97.22639138	94.34858579	91.56982436	88.88615026	86.29378895	83.78913857	81.36876088	79.0293728
210624A00026	6/24/2021	1.6	6/23/2028	6/24/2021	105.23018	99.74785053	94.58376194	89.71780695	85.13124971	80.80662802	76.72766002	72.8791582	69.2469502
210916A00008	9/16/2021	1.48	9/15/2028	9/16/2021	104.63175	98.95581904	93.62154984	88.60669282	83.89055522	79.45388301	75.27875404	71.34847967	67.64751413
220707A00041	7/7/2022	3.41	7/7/2025	7/7/2022	106.81711	104.1288299	101.5223419	98.99463358	96.54282698	94.16417	91.85603017	89.61588834	87.44133298
220920A00026	9/20/2022	4.1	9/20/2027	9/20/2022	116.82797	111.7744476	106.9752009	102.4160778	98.08378474	93.96583092	90.05047624	86.32668234	82.78406715
221027A00047	10/27/2022	4.88	4/26/2024	10/27/2022	105.75927	104.2602289	102.7902145	101.348457	99.93421216	98.54676132	97.18541037	95.84948873	94.53834828
200305A00006	3/5/2020	0.99	3/6/2023	3/5/2020	100.14098	99.7934507	99.4483329	99.10560122	98.76523096	98.42719772	98.09147746	97.75804648	97.42688137
201117A00005	11/17/2020	0.5	11/17/2022	11/17/2020	100.02719	99.98008561	99.93303716	99.88604881	99.83912043	99.79225192	99.74544316	99.69869404	99.65200443
220217A00016	2/17/2022	2.24	9/15/2026	2/17/2022	105.89804	102.0729573	98.40731115	94.8936453	91.52489317	88.29435259	85.19566511	82.22279666	79.37001929
220425A00028	4/29/2022	3.16	4/23/2027	4/29/2022	111.16782	106.6490696	102.3427903	98.2378696	94.32383058	90.59079596	87.02945052	83.63100614	80.38716932
221003A00067	10/3/2022	4.48	11/13/2024	10/3/2022	107.24093	105.1864898	103.182268	101.2267146	99.31833587	97.45569476	95.63740824	93.8621449	92.12862261
220609A00034	10/3/2022	3.32	9/30/2024	10/3/2022	104.55161	102.641667	100.7762057	98.95392397	97.1735672	95.43392533	93.73383111	92.07215827	90.44781977
200402A00030	4/2/2020	0.8	4/3/2023	4/2/2020	100.04039	99.61673329	99.19665	98.78009769	98.36703202	97.95740937	97.55118687	97.14832234	96.74877431
201105A00016	11/9/2020	2.18	11/8/2027	11/9/2020	107.69014	102.7306574	98.0301209	93.57366805	89.34736277	85.33813579	81.53372628	77.92262766	74.49403736
201119A00021	11/23/2020	2.22	11/21/2030	11/23/2020	110.29115	102.4450978	95.21979467	88.56280268	82.42637331	76.76700207	71.54503114	66.72429123	62.27177834
220915A00033	9/15/2022	4.3	3/15/2024	9/15/2022	104.51614	103.1396041	101.7878556	100.460283	99.15629272	97.87531012	96.61677883	95.38016001	94.16493163
221031A00035	10/31/2022	4.67	10/30/2026	10/31/2022	115.82574	111.6868423	107.7232396	103.9265415	100.2888091	96.80252421	93.46056459	90.25618094	87.18297534

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200302A00016	3/2/2020	1.36	3/3/2025	3/2/2020	101.08236	98.79923878	96.57862128	94.41846445	92.3168034	90.27174815	88.28148038	86.34425027	84.45837351
200305A00014	3/10/2020	1	2/15/2023	3/10/2020	100.14715	99.85167046	99.55794418	99.26595103	98.97567566	98.6871029	98.40021775	98.11500539	97.83145117
210211A00007	2/11/2021	0.47	9/15/2023	2/11/2021	99.491221	98.62728181	97.77824842	96.94373747	96.12337905	95.31681573	94.52370202	93.74370389	92.97649829
210624A00002	6/24/2021	0.57	6/23/2023	6/24/2021	99.765718	99.12419471	98.49088291	97.86562614	97.2482715	96.63866999	96.03667631	95.44214876	94.85494917
220214A00010	2/14/2022	2.46	12/21/2029	2/14/2022	111.6398	104.5766913	98.01415432	91.91402035	86.24122335	80.96353224	76.05130765	71.47728073	67.21635196
220325A00015	3/28/2022	2.86	3/23/2027	3/28/2022	109.66419	105.2596811	101.0590191	97.05171975	93.22789143	89.57819822	86.09382604	82.76645084	79.58820885
220823A00015	8/23/2022	3.78	8/30/2032	8/23/2022	125.39683	115.3026344	106.1413574	97.8208618	90.2585809	83.38048095	77.1201392	71.41792584	66.22027747
200318A00047	3/18/2020	1.29	3/18/2025	3/18/2020	101.24446	98.91473498	96.64988458	94.44775496	92.30627278	90.22344528	88.19735664	86.2261645	84.30809677
200421A00024	4/24/2020	0.8	10/16/2023	4/24/2020	99.745822	98.79865725	97.86936602	96.95744672	96.06241603	95.18380839	94.32117521	93.47408413	92.64211826
200327A00027	3/27/2020	0.9	3/27/2023	3/27/2020	100.09018	99.68545905	99.28399847	98.88576334	98.49071493	98.09881513	97.71002642	97.32431189	96.94163521
220722A00051	9/15/2022	3.23	9/15/2027	9/15/2022	112.56416	107.626919	102.9388599	98.48610546	94.25562474	90.2351731	86.41324105	82.77900652	79.32229039
221027A00009	10/27/2022	4.68	10/27/2025	10/27/2022	111.45779	108.4040128	105.451834	102.5973073	99.8366604	97.1662883	94.58274545	92.08273748	89.66311371
200417A00013	4/17/2020	0.74	4/17/2023	4/17/2020	99.992752	99.53119539	99.07389403	98.62078908	98.1718229	97.7269389	97.28608151	96.84919619	96.41622935
210104A00006	11/22/2021	0.88	11/20/2026	11/22/2021	100.77016	96.87586584	93.1518246	89.5897116	86.181658	82.92021963	79.79835169	76.80938507	73.94700422
210112A00003	1/12/2021	0.53	9/15/2023	1/12/2021	99.544169	98.67997597	97.83069182	96.99593311	96.17532988	95.36852464	94.57517185	93.7949374	93.02749821
211028A00012	10/28/2021	1.64	10/15/2027	10/28/2021	104.93596	100.1056353	95.52554846	91.18147631	87.06007341	83.14881526	79.43594366	75.910416	72.56185818
220124A00009	1/24/2022	0.86	1/24/2023	1/24/2022	100.1107	99.87574131	99.64189547	99.40915022	99.17749782	98.94693056	98.71744082	98.48902104	98.26166374
220428A00016	5/2/2022	3.09	10/15/2024	5/2/2022	104.20568	102.26001	100.3605672	98.50597483	96.69490292	94.92606992	93.19824057	91.51022393	89.86087142
220628A00034	6/28/2022	3.61	6/28/2027	6/28/2022	113.80304	109.0454846	104.5182928	100.2090321	96.10601251	92.19823606	88.47535201	84.92761498	81.54584611
200402A00038	4/2/2020	0.84	4/2/2025	4/2/2020	100.17695	97.82176763	95.53327167	93.30920929	91.14741677	89.04581583	87.00240975	85.01527966	83.08258099
200415A00031	4/15/2020	0.97	4/15/2025	4/15/2020	100.19234	97.8094381	95.49483675	93.24620066	91.06128595	88.9379386	86.87409031	84.86775452	82.91702267
220315A00021	3/15/2022	2.15	3/15/2024	3/15/2022	101.54563	100.1905589	98.8599081	97.55307775	96.26948391	95.00856128	93.76976243	92.55255712	91.35643164
200326A00011	3/30/2020	1.54	3/31/2025	3/30/2020	101.56076	99.20033447	96.90636221	94.67660882	92.50892767	90.4012565	88.35161363	86.35809425	84.41886704
200421A00031	4/21/2020	0.84	4/19/2024	4/21/2020	99.715441	98.28198892	96.87604499	95.49688743	94.14381961	92.81616851	91.5132838	90.23453683	88.97931976
210225A00007	2/25/2021	1.79	8/23/2030	2/25/2021	106.93012	99.43086407	92.51137155	86.1238613	80.22471475	74.77409603	69.73560645	65.07597208	60.76476119
210319A00003	3/19/2021	0.95	3/19/2025	3/19/2021	100.12786	97.81546268	95.56748836	93.38179974	91.25633837	89.18912569	87.17825948	85.22191042	83.31831889
211117A00009	11/17/2021	0.84	11/17/2023	11/17/2021	99.752442	98.72092475	97.71059328	96.72080022	95.75092471	94.80037067	93.86856558	92.95495937	92.05902327
220921A00069	9/21/2022	3.98	9/21/2027	9/21/2022	116.98358	111.9008479	107.0745849	102.4904816	98.13509818	93.99580878	90.06074799	86.31876134	82.75935917
200527A00013	5/27/2020	1.13	11/25/2026	5/27/2020	101.79477	97.86674265	94.11064583	90.51805702	87.08101535	83.79199067	80.64385784	77.62987263	74.7436492
201119A00003	11/19/2020	0.56	11/17/2023	11/19/2020	99.456894	98.42704415	97.4183554	96.43018179	95.461903	94.51292348	93.58267124	92.6705967	91.77617157
210914A00015	9/14/2021	0.81	9/15/2025	9/14/2021	100.23054	97.44410443	94.74852755	92.14037864	89.6163758	87.17337809	84.80837863	82.51849818	80.30097899
220629A00003	6/29/2022	3.59	6/29/2027	6/29/2022	113.71917	108.9608053	104.4329817	100.123252	96.01991076	92.1119463	88.38899522	84.84130057	81.45967288
220502A00025	5/2/2022	3.21	5/2/2025	5/2/2022	105.82093	103.3222369	100.8959303	98.53948938	96.25050114	94.02665087	91.86571772	89.76557021	87.72416209

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210623A00026	6/23/2021	0.78	6/24/2024	6/23/2021	99.634386	98.02774592	96.45433497	94.91318686	93.40337271	91.92399926	90.47420716	89.05316932	87.66008936
221018A00031	10/18/2022	4.71	10/17/2025	10/18/2022	111.43686	108.4099785	105.482948	102.6519256	99.91323429	97.26335882	94.69893787	92.21675633	89.81373805
200304A00035	3/4/2020	1.17	3/4/2025	3/4/2020	100.63798	98.35760021	96.13974424	93.98236805	91.88350373	89.84125853	87.8538115	85.9194104	84.03636865
220201A00011	2/1/2022	1.86	4/20/2026	2/1/2022	103.75975	100.3598974	97.08961492	93.94328879	90.91557551	88.00139085	85.19589584	82.49448357	79.89276676
220217A00018	2/17/2022	2.28	2/17/2027	2/17/2022	106.89444	102.6419338	98.58307672	94.70803378	91.0075263	87.4727933	84.09555974	80.86800696	77.78274495
220412A00018	4/12/2022	3.09	3/15/2027	4/12/2022	110.56565	106.1637364	101.964354	97.95714008	94.13231472	90.48064472	86.99341042	83.66237455	80.47975311
200429A00004	5/1/2020	0.74	5/1/2023	5/1/2020	99.970648	99.47119055	98.97670011	98.48710263	98.00232587	97.522299	97.04695258	96.57621851	96.11003001
220224A00010	2/24/2022	2.04	3/10/2025	2/24/2022	102.70001	100.3796081	98.12307376	95.92830217	93.7932728	91.71604282	89.69474359	87.72757741	85.81281442
210208A00002	2/10/2021	0.45	6/15/2023	2/10/2021	99.709117	99.08925481	98.47706805	97.87241499	97.27515719	96.68515958	96.10229035	95.52642089	94.95742564
220419A00015	4/19/2022	3.14	4/17/2026	4/19/2022	108.16878	104.7005101	101.3633402	98.15161925	95.05996701	92.08326317	89.2166335	86.4554366	83.79525145
221019A00009	10/19/2022	4.8	10/17/2025	10/19/2022	111.7035	108.6726368	105.7417287	102.9069244	100.1645435	97.5110679	94.94313335	92.45752199	90.05115502
200114A00021	1/11/2021	1.93	1/11/2024	1/11/2021	101.05042	99.86594254	98.70911727	97.57898462	96.47462891	95.39517597	94.33979073	93.30767509	92.29806594
200402A00014	4/2/2020	0.84	4/2/2025	4/2/2020	100.17695	97.82176763	95.53327167	93.30920929	91.14741677	89.04581583	87.00240975	85.01527966	83.08258099
200413A00012	4/13/2020	0.64	4/13/2023	4/13/2020	99.993995	99.54281918	99.09571173	98.65261768	98.21348304	97.77825482	97.34688096	96.91931031	96.49549266
220915A00039	9/15/2022	4.29	4/15/2024	9/15/2022	104.77586	103.3143713	101.8806569	100.473993	99.09368002	97.73904237	96.40942692	95.10420228	93.82275785
200916A00017	9/16/2020	0.54	9/15/2023	9/16/2020	99.552993	98.68875834	97.83943239	97.00463239	96.18398836	95.37714279	94.58375015	93.80347632	93.03599819
220314A00005	3/14/2022	2.36	3/14/2025	3/14/2022	103.4732	101.1331929	98.85779327	96.64486957	94.49237026	92.39832299	90.36083106	88.37807011	86.44828487
200417A00006	4/17/2020	0.74	4/17/2023	4/17/2020	99.992752	99.53119539	99.07389403	98.62078908	98.1718229	97.7269389	97.28608151	96.84919619	96.41622935
211015A00029	10/15/2021	0.98	10/15/2024	10/15/2021	100.05779	98.15385691	96.29535209	94.48091679	92.70924284	90.97906968	89.28918227	87.63840914	86.02562052
220131A00011	1/31/2022	1.52	1/31/2024	1/31/2022	100.58515	99.35106593	98.14706861	96.97207301	95.82504194	94.70498712	93.6109663	92.54208068	91.49747235
200218A00026	2/21/2020	1.73	3/25/2024	2/21/2020	100.98064	99.60374753	98.25210245	96.92506981	95.6220367	94.34241011	93.08561611	91.85109905	90.6383209
200330A00064	3/30/2020	0.83	3/30/2023	3/30/2020	100.0583	99.64547179	99.23603936	98.82995693	98.4271836	98.02767913	97.63140392	97.23831901	96.84838609
210225A00013	3/1/2021	0.93	10/6/2025	3/1/2021	100.22911	97.39702131	94.65880584	92.01086172	89.44974346	86.9721562	84.57494822	82.25510389	80.00973704
220308A00016	3/8/2022	2.37	3/8/2029	3/8/2022	110.3387	104.0472689	98.15856684	92.64473755	87.47998758	82.64042186	78.10389516	73.84987573	69.85932028
200316A00072	3/16/2020	1.18	3/16/2023	3/16/2020	100.20597	99.83098068	99.45880272	99.08940405	98.72275353	98.35882048	97.99757467	97.63898634	97.28302614
220317A00028	5/3/2022	2.59	5/3/2027	5/3/2022	108.68899	104.1987511	99.92152918	95.84610174	91.96189318	88.25893722	84.72783856	81.35973718	78.14627502
200228A00091	2/28/2020	1.72	12/7/2029	2/28/2020	106.42089	99.57286344	93.21161263	87.30004011	81.80405903	76.69233259	71.93603888	67.50865684	63.38577156
200916A00019	9/16/2020	0.42	9/16/2024	9/16/2020	99.213406	97.38857066	95.60575126	93.8637373	92.16136122	90.49749628	88.87105489	87.28098693	85.72627826
210129A00002	2/3/2021	0.59	7/25/2024	2/3/2021	99.298587	97.61476813	95.96707727	94.35441689	92.7757342	91.23001898	89.71630132	88.23364963	86.78116868
200221A00023	2/21/2020	2.05	12/7/2029	2/21/2020	108.73468	101.8067914	95.36969252	89.38604563	83.82153884	78.6446255	73.82628787	69.33982211	65.16064259
200331A00022	4/1/2020	1.07	4/1/2025	4/1/2020	100.42426	98.07515474	95.79234765	93.57360552	91.41678334	89.31982056	87.2807372	85.29763025	83.36867017
200909A00001	9/9/2020	0.98	9/8/2028	9/9/2020	102.53144	96.90399032	91.61621732	86.64598877	81.97271773	77.57724845	73.44175014	69.54961923	65.88538914
200922A00015	9/24/2020	1.09	9/24/2025	9/24/2020	100.68196	97.87395972	95.15801424	92.53062438	89.98844661	87.52828186	85.1470685	82.84187561	80.60989672

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
201019A00007	10/19/2020	0.64	10/21/2024	10/19/2020	99.388076	97.47562816	95.6092011	93.78740753	92.0089117	90.27242688	88.57671325	86.92057577	85.30286231
220526A00010	5/26/2022	3	5/26/2026	5/26/2022	107.97806	104.4098208	100.9798677	97.68208366	94.51065477	91.46005623	88.52503624	85.70060087	82.98199988
200317A00045	3/19/2020	1.43	3/19/2025	3/19/2020	101.27393	98.94764463	96.68608579	94.48710188	92.34862586	90.26867093	88.24532692	86.2767569	84.36119387
210729A00004	7/29/2021	1.74	7/29/2031	7/29/2021	106.28686	98.00395236	90.42962391	83.499555	77.15557392	71.34504349	66.02030788	61.13819754	56.65958563
200302A00005	3/2/2020	1.31	3/3/2025	3/2/2020	100.96515	98.68342598	96.46417347	94.30535289	92.20500019	90.16122621	88.17221341	86.23621272	84.35154057
200327A00043	3/27/2020	1.48	3/27/2028	3/27/2020	105.20376	99.920306	94.93282637	90.22327772	85.77480047	81.57163924	77.59906524	73.84330438	70.29147083
200330A00028	3/30/2020	1.09	3/28/2025	3/30/2020	100.46928	98.12986463	95.85619966	93.64607872	91.49738306	89.40807696	87.37620399	85.3998834	83.47730677
201123A00010	11/25/2020	1.48	11/24/2025	11/25/2020	101.97277	98.98792742	96.1055532	93.32155863	90.63204271	88.03328266	85.52172463	83.09397491	80.74679175
210311A00007	3/11/2021	1.06	3/11/2026	3/11/2021	100.90622	97.65801222	94.53042855	91.51838967	88.61705303	85.82180394	83.12824366	80.53217814	78.02960741
211221A00023	12/21/2021	1.53	6/19/2026	12/21/2021	102.83577	99.29611381	95.89661575	92.6309594	89.49314838	86.47749036	83.57857972	80.79128129	78.11071513
211222A00035	12/22/2021	2.15	12/22/2033	12/22/2021	110.05791	99.60005351	90.24457393	81.86893122	74.36479923	67.63635431	61.59877535	56.17693041	51.30422593
220106A00007	1/6/2022	2.42	1/6/2034	1/6/2022	112.97205	102.3268752	92.8025558	84.27438767	76.63216272	69.77841297	63.62687887	58.10116857	53.13358362
220302A00010	3/2/2022	2.14	1/13/2027	3/2/2022	106.14571	102.0027093	98.04475945	94.26257425	90.64739245	87.19094044	83.8854021	80.72339061	77.69792231
220324A00015	3/24/2022	2.79	3/3/2026	3/24/2022	106.65747	103.3332785	100.1308722	97.04516513	94.07131155	91.20469208	88.44090184	85.77573933	83.20519603
220630A00044	6/30/2022	3.34	6/30/2025	6/30/2022	106.57887	103.9122274	101.3262755	98.8180653	96.38477393	94.02370132	91.73226373	89.50798791	87.34850549
220802A00009	8/2/2022	3	8/2/2027	8/2/2022	111.1621	106.375073	101.8246902	97.49794059	93.38260421	89.4671982	85.74092794	82.19364166	78.81578842
200306A00031	3/6/2020	1.01	3/6/2025	3/6/2020	100.26364	97.98262642	95.76431854	93.60665463	91.50765707	89.46542391	87.47812556	85.54400155	83.66135758
200316A00041	3/16/2020	1.16	3/16/2023	3/16/2020	100.19842	99.8234503	99.45128973	99.08190837	98.71527505	98.35135911	97.99013032	97.63155892	97.27561555
200423A00027	4/28/2020	0.88	4/15/2024	4/28/2020	99.775306	98.352009	96.95582789	95.58605632	94.24201226	92.92303666	91.62849248	90.35776379	89.1102549
200428A00003	4/29/2020	1.01	4/29/2025	4/29/2020	100.30269	97.88177837	95.5312952	93.24879034	91.03191599	88.87841995	86.78614108	84.75300508	82.77702036
210609A00003	6/9/2021	0.47	6/9/2023	6/9/2021	99.73752	99.13365866	98.53707889	97.94764951	97.36524256	96.78973311	96.22099916	95.65892159	95.10338408
211123A00012	11/23/2021	2.27	11/23/2033	11/23/2021	111.31711	100.8575455	91.49182356	83.09918159	75.57278011	68.81803145	62.75113905	57.29781739	52.39216939
200309A00038	3/9/2020	1.26	3/11/2030	3/9/2020	103.10825	96.14454978	89.69455202	83.71786127	78.17744868	73.03935268	68.27241101	63.84801739	59.73990046
200326A00009	3/27/2020	1.54	3/27/2025	3/27/2020	101.55271	99.20259477	96.91838246	94.69786078	92.5389092	90.43949019	88.39764549	86.4114925	84.47922095
201021A00011	10/21/2020	1.11	10/21/2027	10/21/2020	102.32995	97.54848212	93.01642994	88.71954518	84.64446355	80.7786464	77.11032559	73.62845228	70.32264938
200228A00070	5/18/2020	1.35	5/18/2023	5/18/2020	100.27841	99.73204539	99.19162175	98.6570451	98.12822083	97.60505637	97.08746111	96.57534639	96.06862541
210217A00009	2/18/2021	0.68	11/15/2024	2/18/2021	99.47123	97.49264204	95.56289412	93.68046792	91.84390388	90.05179798	88.30279919	86.5956071	84.92896956
210219A00004	2/19/2021	0.91	2/19/2026	2/19/2021	100.3643	97.17807653	94.10846925	91.15059629	88.299808	85.55167436	82.90197327	80.34667961	77.8819548
200306A00077	3/6/2020	1.06	3/6/2025	3/6/2020	100.38125	98.09883724	95.87915497	93.72014568	91.61983088	89.5763078	87.58774606	85.65238442	83.76852787
220106A00011	1/6/2022	2.7	1/6/2038	1/6/2022	118.11287	103.9988249	91.80772228	81.26331424	72.130517	64.20908805	57.32829931	51.34244798	46.12706962
200224A00006	2/24/2020	1.58	11/15/2024	2/24/2020	101.31648	99.31856936	97.36987528	95.46887247	93.61409094	91.80411665	90.03758889	88.31319793	86.62968266
211207A00011	12/7/2021	1.62	12/1/2026	12/7/2021	103.80628	99.82182962	96.01183293	92.36773399	88.88144128	85.54530229	82.35207719	79.2949142	76.36732661
220217A00013	2/17/2022	2.08	2/14/2025	2/17/2022	102.69571	100.4413469	98.24743533	96.11197233	94.03303568	92.00878024	90.03743425	88.11729581	86.24672957

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200305A00015	3/5/2020	0.99	3/6/2023	3/5/2020	100.14098	99.7934507	99.4483329	99.10560122	98.76523096	98.42719772	98.09147746	97.75804648	97.42688137
200326A00016	3/26/2020	1.54	3/25/2025	3/26/2020	101.54867	99.20372041	96.92439132	94.70848982	92.55390834	90.45862161	88.42068298	86.4382209	84.50943553
200605A00005	6/5/2020	0.99	6/5/2025	6/5/2020	100.28313	97.76729229	95.32667634	92.95857849	90.66041368	88.42970639	86.2640852	84.16127762	82.11910529
210224A00006	2/26/2021	0.88	10/21/2025	2/26/2021	100.09285	97.22509143	94.45365525	91.77479097	89.1849175	86.68061259	84.25860481	81.91576601	79.64910418
200325A00016	3/30/2020	1.67	3/31/2025	3/30/2020	101.87539	99.51110572	97.21335712	94.97990855	92.80861096	90.69739976	88.64429103	86.64737782	84.70482672
201116A00024	11/18/2020	2.36	11/15/2034	11/18/2020	112.6888	101.3614649	91.30740859	82.37571335	74.43409202	67.36650591	61.07109534	55.45838276	50.44971142
201123A00009	11/25/2020	1.02	11/25/2024	11/25/2020	100.18092	98.16824601	96.20563475	94.29151479	92.42437434	90.60275998	88.82527389	87.09057133	85.39735813
210104A00009	12/20/2021	0.89	12/18/2026	12/20/2021	100.86592	96.8983025	93.10672997	89.48246418	86.0172527	82.70329604	79.5332202	76.50005088	73.59718952
211028A00013	10/28/2021	1.65	10/22/2027	10/28/2021	105.00169	100.1522245	95.55486412	91.19523058	87.05983364	83.136016	79.41189769	75.87632437	72.51881942
220727A00010	7/27/2022	3.38	7/24/2024	7/27/2022	104.15193	102.4271795	100.7392559	99.08703907	97.46945922	95.88548969	94.33414469	92.81447725	91.32557726
200330A00008	3/30/2020	1.09	3/28/2025	3/30/2020	100.46928	98.12986463	95.85619966	93.64607872	91.49738306	89.40807696	87.37620399	85.3998834	83.47730677
210616A00006	2/11/2022	0.86	2/11/2025	2/11/2022	99.888485	97.67541836	95.52168378	93.42530455	91.38438518	89.39710706	87.46172476	85.57656242	83.74001039
200529A00022	6/1/2020	0.98	6/1/2026	6/1/2020	100.79893	97.34331029	94.0234064	90.83315739	87.7668125	84.81890891	81.98425557	79.25791805	76.6352043
201030A00016	10/30/2020	1.14	10/8/2027	10/30/2020	102.46552	97.71287807	93.20645147	88.93226837	84.87722055	81.02900392	77.3760652	73.90755239	70.61326877
201203A00005	12/3/2020	0.78	12/3/2026	12/3/2020	100.91417	96.96835892	93.19658532	89.59027094	86.1413055	82.84202063	79.68516324	76.66387061	73.77164718
210616A00012	3/18/2022	0.9	3/18/2025	3/18/2022	100.00821	97.69978994	95.45563461	93.2736053	91.15165082	89.0877995	87.08015563	85.12689613	83.22626726
210709A00006	7/13/2021	2.4	7/11/2031	7/13/2021	111.92447	103.4468468	95.68498762	88.57450172	82.05711481	76.08005497	70.59550658	65.56012112	60.93457849
211123A00010	11/23/2021	0.94	11/24/2023	11/23/2021	99.856463	98.80589606	97.77728016	96.76993343	95.78320205	94.81645878	93.86910158	92.94055236	92.03025558
200302A00013	3/2/2020	1.25	3/4/2024	3/2/2020	100.29981	98.98215503	97.68780765	96.4162018	95.16679058	93.93904412	92.732449	91.54650756	90.38073736
200423A00006	4/23/2020	0.82	4/23/2025	4/23/2020	100.1428	97.73285947	95.39272488	93.11998245	90.91231553	88.76750136	86.6834066	84.65798319	82.68926437
210914A00018	9/14/2021	1.43	9/14/2029	9/14/2021	105.37087	98.72585355	92.54157938	86.78383433	81.42110318	76.42434665	71.76679542	67.42376229	63.37247076
220325A00012	3/28/2022	2.85	3/23/2026	3/28/2022	106.99241	103.6106843	100.3546124	97.21886959	94.19838828	91.28834103	88.48412792	85.78136451	83.17587068
221011A00122	10/11/2022	4.64	12/11/2024	10/11/2022	107.87485	105.7372913	103.6532313	101.6209614	99.63884353	97.70530445	95.81883219	93.9779734	92.18133051
221024A00067	10/24/2022	4.92	10/24/2023	10/24/2022	103.80515	102.8154305	101.8446642	100.892314	99.95785844	99.04079566	98.14064235	97.25693303	96.38921914
201030A00018	10/30/2020	1.15	10/22/2027	10/30/2020	102.52869	97.73987686	93.20091783	88.89753366	84.81633198	80.94474816	77.27099002	73.78398647	70.47333982
210330A00015	3/30/2021	0.47	3/30/2023	3/30/2021	99.908475	99.49602349	99.08696163	98.68124756	98.27884038	97.87969989	97.4837865	97.09106129	96.70148593
200401A00001	4/1/2020	1.01	4/1/2025	4/1/2020	100.27888	97.93156288	95.6505026	93.43346971	91.27832033	89.18299498	87.14551472	85.16397753	83.23655484
200527A00012	5/27/2020	1.2	5/27/2027	5/27/2020	102.51169	98.09850829	93.89893135	89.90152328	86.09552421	82.47080337	79.01781887	75.72758029	72.59161388
220311A00013	3/15/2022	2.35	3/15/2027	3/15/2022	107.34618	103.0139696	98.88195558	94.93987725	91.17804726	87.58732051	84.15906117	80.88511173	77.7577642
200304A00032	3/4/2020	1.6	12/15/2028	3/4/2020	105.41966	99.49260947	93.93525376	88.72264881	83.83165671	79.2408084	74.93017473	70.88124833	67.07683495
200330A00043	3/30/2020	0.86	3/30/2023	3/30/2020	100.07078	99.65792581	99.2484625	98.84234938	98.43954554	98.04001073	97.64370537	97.25059049	96.86062777
210907A00006	9/7/2021	2.1	9/7/2034	9/7/2021	109.66547	98.65819709	88.87659184	80.1770459	72.43346175	65.53504084	59.38435999	53.89569775	48.99357733
220126A00003	1/26/2022	1.9	12/18/2026	1/26/2022	105.02383	100.9709135	97.09676224	93.39253513	89.84987521	86.46088343	83.21809084	80.11443267	77.14322405

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220217A00015	2/17/2022	2.28	2/16/2027	2/17/2022	106.88811	102.6386081	98.58249346	94.70995188	91.01171862	87.47904615	84.10367237	80.87779097	77.79402377
220721A00017	7/21/2022	3.51	1/22/2024	7/21/2022	103.03267	101.8062731	100.6091034	99.44012754	98.29835706	97.18284932	96.09270482	95.02706476	93.98510873
221006A00095	10/6/2022	4.65	4/8/2024	10/6/2022	105.23296	103.7870803	102.3683306	100.9760112	99.60944714	98.26798578	96.95099614	95.65786794	94.38801075
200413A00026	4/13/2020	0.82	4/13/2023	4/13/2020	100.03543	99.58461547	99.13786058	98.69510977	98.25630932	97.82140644	97.39034929	96.96308696	96.5395694
210127A00009	1/27/2021	1.3	7/27/2029	1/27/2021	103.55929	97.13303363	91.14439028	85.56134066	80.35437224	75.496268	70.96191607	66.72813618	62.7735213
210420A00009	4/20/2021	1.08	12/5/2025	4/20/2021	100.76709	97.77230388	94.881251	92.08975451	89.39383276	86.78968781	84.27369574	81.84239754	79.49249047
220325A00018	3/28/2022	2.85	9/10/2026	3/28/2022	108.21773	104.3613214	100.664621	97.12020042	93.72101271	90.46037268	87.33193667	84.32968325	81.44789528
220628A00044	8/15/2022	3.6	8/13/2027	8/15/2022	114.08862	109.2034985	104.5602851	100.1456735	95.94716674	91.95301873	88.15218487	84.53427638	81.08951768
220722A00044	9/1/2022	3.23	9/1/2027	9/1/2022	112.46425	107.5671839	102.915492	98.49561245	94.29479905	90.30106922	86.50315459	82.89045499	79.45299554
210208A00015	2/10/2021	0.46	8/25/2023	2/10/2021	99.530735	98.72225487	97.92682395	97.14412863	96.37386521	95.61573958	94.86946684	94.13477093	93.41138433
210929A00011	3/16/2022	1.03	3/14/2025	3/16/2022	100.31572	98.01375157	95.77557655	93.59908768	91.48225679	89.42313402	87.41984432	85.47058411	83.5736182
220609A00035	8/30/2022	3.11	9/29/2023	8/30/2022	101.89116	100.9782588	100.0817001	99.20104834	98.33588286	97.48579778	96.65040129	95.82931504	95.02217357
220701A00050	7/1/2022	3.26	7/1/2027	7/1/2022	112.20411	107.4752968	102.976283	98.69463786	94.61867128	90.73738698	87.04043724	83.51808088	80.16114429
220823A00002	8/23/2022	3.38	8/23/2027	8/23/2022	113.82478	108.8973376	104.2158295	99.76667737	95.53712119	91.51516737	87.68953887	84.0496286	80.58545621
200310A00041	3/10/2020	1.39	3/12/2029	3/10/2020	104.17418	98.06427095	92.34959357	87.00264765	81.99797489	77.31199878	72.92287678	68.81036479	64.95569288
200327A00022	3/27/2020	0.9	3/27/2023	3/27/2020	100.09018	99.68545905	99.28399847	98.88576334	98.49071493	98.09881513	97.71002642	97.32431189	96.94163521
200331A00008	3/31/2020	0.64	3/31/2023	3/31/2020	100.01484	99.59896465	99.18653535	98.77750609	98.37183503	97.96948104	97.57040363	97.17456298	96.78191991
210928A00007	9/28/2021	0.88	9/27/2024	9/28/2021	99.852065	97.99638269	96.18394413	94.41348759	92.68379676	90.99369843	89.34206066	87.72779106	86.14983513
200826A00019	8/26/2020	0.98	8/26/2026	8/26/2020	100.98608	97.30720078	93.78070835	90.39952854	87.15695237	84.04661515	81.062477	78.19880452	75.45015366
201015A00032	10/19/2020	2.33	10/19/2026	10/19/2020	106.44073	102.5165601	98.75947935	95.16150559	91.71507811	88.41303518	85.24859081	82.21531307	79.30710366
201215A00001	12/15/2020	0.76	12/15/2025	12/15/2020	99.785622	96.78077494	93.88084958	91.08158836	88.3789338	85.76901732	83.24814922	80.81280913	78.45963712
211206A00009	12/6/2021	1.43	12/5/2025	12/6/2021	101.85042	98.83877953	95.93130662	93.12380789	90.41228769	87.79293468	85.26211205	82.81634843	80.45232926
200310A00021	3/10/2020	1.1	3/10/2025	3/10/2020	100.47862	98.18486743	95.95440697	93.78515756	91.675115	89.62235213	87.62501541	85.68132166	83.78955501
220715A00001	7/15/2022	3.44	7/15/2027	7/15/2022	113.1504	108.3627247	103.8090429	99.47660923	95.3534493	91.42830463	87.6905856	84.13032768	80.73815096
220915A00036	9/15/2022	4.23	9/16/2024	9/15/2022	106.16297	104.2752752	102.4306853	100.6279657	98.86592114	97.14339854	95.45928462	93.8125045	92.20202012
220930A00049	9/30/2022	4.55	6/28/2024	9/30/2022	105.92743	104.2558677	102.6188721	101.015437	99.44459247	97.90540586	96.39698015	94.91845219	93.4689911
200310A00062	3/10/2020	1.05	3/8/2024	3/10/2020	100.02817	98.70211498	97.39968277	96.1202965	94.86339826	93.62844764	92.41492113	91.22231141	90.05012676
200311A00050	3/2/2021	1.46	3/2/2026	3/2/2021	102.22127	98.97375913	95.84583642	92.8325041	89.92899485	87.13076402	84.43347814	81.83300392	79.32539804
200331A00024	3/31/2020	0.64	3/31/2023	3/31/2020	100.01484	99.59896465	99.18653535	98.77750609	98.37183503	97.96948104	97.57040363	97.17456298	96.78191991
200824A00020	8/26/2020	1.57	8/26/2025	8/26/2020	101.99522	99.24398816	96.5805354	94.00159622	91.50404279	89.0848808	86.7412429	84.4703826	82.26966845
220121A00013	1/21/2022	1.78	11/3/2025	1/21/2022	102.81174	99.86985458	97.02746639	94.2806649	91.62571797	89.05906083	86.57728757	84.17714306	81.8555154
220728A00070	7/28/2022	3.19	1/29/2024	7/28/2022	102.6793	101.43662	100.2240167	99.04040417	97.88475147	96.75607598	95.65344067	94.57595148	93.52275486
220816A00009	8/16/2022	3.33	8/16/2027	8/16/2022	112.82634	107.9630778	103.3414065	98.94802486	94.77043354	90.79688422	87.01633018	83.4183807	79.99325848

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220831A00078	8/31/2022	3.81	8/30/2024	8/31/2022	105.21981	103.3873742	101.5958946	99.84421154	98.13121018	96.45581389	94.81698278	93.21371223	91.64503144
220913A00018	9/13/2022	3.91	9/13/2027	9/13/2022	115.84182	110.8312427	106.0721873	101.5506938	97.25364876	93.1687282	89.28434631	85.58960762	82.07426246
220919A00033	9/19/2022	4	9/17/2027	9/19/2022	116.31435	111.2814439	106.5015493	101.9606021	97.64538916	93.54349486	89.64324841	85.93367575	82.40445447
211026A00012	10/26/2021	1.52	10/26/2026	10/26/2021	103.26117	99.38207139	95.66962409	92.11581115	88.71304365	85.45413549	82.33227987	79.34102723	76.47426456
200331A00016	3/31/2020	1.11	3/31/2026	3/31/2020	101.55393	98.23315361	95.03764245	91.96203552	89.00122797	86.15035921	83.40479983	80.76013938	78.21217481
200826A00028	8/28/2020	1.08	8/28/2024	8/28/2020	100.19303	98.4132701	96.67335706	94.97216262	93.30859657	91.68160658	90.09017659	88.53332534	87.01010493
200327A00040	3/27/2020	0.72	3/27/2023	3/27/2020	100.05308	99.64802533	99.24624612	98.84770021	98.45234866	98.0601532	97.67107614	97.28508038	96.90212944
200417A00019	4/17/2020	0.77	4/17/2025	4/17/2020	100.01515	97.62256485	95.29885095	93.041642	90.8486667	88.71774512	86.64678444	84.63377491	82.676786
201218A00014	12/18/2020	0.57	12/18/2025	12/18/2020	99.592004	96.57292299	93.65971019	90.84805227	88.13383941	85.51315399	82.9822603	80.53759483	78.17575717
220317A00027	5/3/2022	2.59	5/3/2027	5/3/2022	108.68899	104.1987511	99.92152918	95.84610174	91.96189318	88.25893722	84.72783856	81.35973718	78.14627502
220930A00046	9/30/2022	4.55	8/30/2024	9/30/2022	106.58172	104.7364176	102.932308	101.1682283	99.44305725	97.75571189	96.10514641	94.49035042	92.91034757
200218A00025	2/21/2020	1.71	2/24/2023	2/21/2020	100.37748	100.0568216	99.73820869	99.42162262	99.10704409	98.79445407	98.48383377	98.1751646	97.86842826
200312A00009	3/12/2020	1.46	3/12/2027	3/12/2020	103.46523	99.22458654	95.18065235	91.32332945	87.64309036	84.13094086	80.77838749	77.57740717	74.52041888
201221A00014	12/21/2020	0.76	12/19/2025	12/21/2020	99.789224	96.77419284	93.86472063	91.05651161	88.34547253	85.7277014	83.19947721	80.75725031	78.39763336
210225A00003	3/1/2021	0.93	9/24/2025	3/1/2021	100.2179	97.41668602	94.70735433	92.08641779	89.55053804	87.09652102	84.72130986	82.42197825	80.19572411
210302A00005	3/5/2021	0.92	9/10/2025	3/5/2021	100.17469	97.41056332	94.73600673	92.14765653	89.64229639	87.21684718	84.86836039	82.59401183	80.39109577
210826A00013	8/26/2021	1.97	2/28/2033	8/26/2021	108.09987	98.40261038	89.66473734	81.78613202	74.67759044	68.25958683	62.46118092	57.21905325	52.47665309
220804A00037	8/4/2022	3.35	8/4/2025	8/4/2022	106.8578	104.0953749	101.4189294	98.82523963	96.31122407	93.87393856	91.51056898	89.21842451	86.99493117
200312A00037	3/12/2020	1.3	3/12/2025	3/12/2020	100.95399	98.6494271	96.40855649	94.22927311	92.10955668	90.04746477	88.0411293	86.08875325	84.18860758
200730A00013	7/30/2020	0.74	1/30/2025	7/30/2020	99.60355	97.42755018	95.30911799	93.24630827	91.2372584	89.28018438	87.37337678	85.51519687	83.70407304
201028A00011	10/28/2020	0.91	4/28/2026	10/28/2020	100.48465	97.12092385	93.88676031	90.77649672	87.78474746	84.90639025	82.13655182	79.47059437	76.90410289
220203A00009	2/3/2022	1.99	2/2/2027	2/3/2022	105.61292	101.429203	97.43458475	93.61947372	89.9748255	86.49210438	83.16325154	79.98065536	76.93712391
220420A00032	4/20/2022	3.26	10/16/2026	4/20/2022	110.09435	106.1059257	102.286168	98.62705168	95.12097638	91.76074147	88.53952285	85.45085119	82.48859162
220516A00034	5/16/2022	2.72	11/16/2023	5/16/2022	101.73216	100.6921455	99.67336536	98.67517616	97.69695792	96.73811543	95.79807689	94.87629286	93.97223511
220722A00050	9/15/2022	3.25	9/15/2025	9/15/2022	106.88073	104.0064008	101.2248184	98.53250323	95.92612224	93.4024849	90.9585365	88.59135151	86.29812743
220817A00036	10/14/2022	3.41	10/15/2027	10/14/2022	113.65707	108.6136247	103.8283207	99.28656913	94.97468278	90.87981341	86.98989604	83.2935972	79.78026693
200306A00028	3/6/2020	1.01	3/6/2025	3/6/2020	100.26364	97.98262642	95.76431854	93.60665463	91.50765707	89.46542391	87.47812556	85.54400155	83.66135758
200916A00016	9/16/2020	0.6	9/16/2024	9/16/2020	99.313971	97.49256964	95.71302634	93.97413783	92.27474275	90.61372029	88.98998847	87.40250252	85.85025339
200504A00007	5/4/2020	1.47	5/4/2028	5/4/2020	104.43951	99.10586282	94.07593007	89.3308867	84.85316738	80.62637673	76.63520554	72.86535343	69.3034574
220408A00013	4/8/2022	3.15	1/14/2027	4/8/2022	110.38232	106.1483342	102.1024819	98.23534482	94.53803561	91.00216103	87.61979139	84.38343205	81.28599687
200316A00048	3/16/2020	1.11	3/16/2023	3/16/2020	100.17955	99.80462436	99.43250728	99.06316916	98.69657886	98.33270569	97.97151945	97.61299035	97.25708907
200430A00030	4/30/2020	0.96	4/30/2025	4/30/2020	100.17845	97.75649849	95.40509289	93.12177484	90.90419007	88.75008028	86.65727861	84.62370534	82.64736378
210730A00009	7/30/2021	0.74	7/31/2024	7/30/2021	99.561244	97.85962575	96.19476924	94.56554872	92.97088495	91.40974268	89.88112838	88.38408808	86.9177054

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220502A00030	5/4/2022	3.24	6/20/2025	5/4/2022	106.24004	103.6051063	101.0493123	98.56978824	96.16378794	93.82868344	91.56195887	89.36120481	87.22411303
220726A00032	7/26/2022	3.36	7/26/2023	7/26/2022	101.76207	101.0241187	100.2968678	99.58008686	98.873551	98.17704154	97.49034603	96.81325797	96.14557665
210826A00008	8/26/2021	0.89	2/26/2025	8/26/2021	99.977196	97.72051203	95.52535748	93.38972156	91.3116711	89.28934698	87.32096086	85.404792	83.53918436
220209A00011	2/9/2022	2.14	1/11/2027	2/9/2022	106.13555	101.9979075	98.04487367	94.26719708	90.65614655	87.20347621	83.90139556	80.74254153	77.71995239
220314A00008	3/14/2022	2.38	7/28/2025	3/14/2022	104.14622	101.4397575	98.81732035	96.27575289	93.81204138	91.42330718	89.10679955	86.85988887	84.68006032
200421A00029	4/24/2020	0.72	12/15/2022	4/24/2020	100.07312	99.94853446	99.82427477	99.70033886	99.57672543	99.45343319	99.33046086	99.20780718	99.08547086
210624A00003	6/24/2021	0.78	6/24/2024	6/24/2021	99.634386	98.02774592	96.45433497	94.91318686	93.40337271	91.92399926	90.47420716	89.05316932	87.66008936
210916A00003	9/16/2021	0.75	9/16/2024	9/16/2021	99.596988	97.77284673	95.99061556	94.24908939	92.54710549	90.88354171	89.25731476	87.66737863	86.11272309
220301A00014	3/1/2022	1.85	1/10/2025	3/1/2022	102.0491	99.89672393	97.8000578	95.75725827	93.76656183	91.82627747	89.93478299	88.09052157	86.29199856
200319A00025	3/19/2020	1.39	3/21/2024	3/19/2020	100.49918	99.13616472	97.79797431	96.48399274	95.19362108	93.92627973	92.68140758	91.45846129	90.25691462
210225A00016	3/1/2021	0.88	7/15/2025	3/1/2021	100.02493	97.40849001	94.87285493	92.41501228	90.03208848	87.72133722	85.48013274	83.30596359	81.19642671
211220A00006	12/20/2021	1.21	12/20/2024	12/20/2021	100.61182	98.52961129	96.50033023	94.52227032	92.59379098	90.71331723	88.87933642	87.09039527	85.34509702
221021A00022	10/21/2022	4.84	10/21/2024	10/21/2022	107.71322	105.7163409	103.7671112	101.8641011	100.0059304	98.19126964	96.41883797	94.68740069	92.99576749
221014A00027	10/14/2022	4.63	10/14/2027	10/14/2022	119.65786	114.4704714	109.5463881	104.8707954	100.4297919	96.21032602	92.2001393	88.38771439	84.76222643
200521A00015	5/21/2020	2.14	5/21/2036	5/21/2020	110.39056	98.01919775	87.19445237	77.71322737	69.40009456	62.10340424	55.69195574	50.05214837	45.08554134
220331A00004	3/31/2022	2.66	5/20/2024	3/31/2022	102.55807	101.0205059	99.51353534	98.03631368	96.58802771	95.16789342	93.77515475	92.40908235	91.06897238
200310A00051	3/10/2020	1.41	3/8/2030	3/10/2020	104.2001	97.20448111	90.72354531	84.71689753	79.14750073	73.98138117	69.18736125	64.73681672	60.60345613
200327A00031	3/27/2020	1.18	3/27/2025	3/27/2020	100.68533	98.34581594	96.07197193	93.86159657	91.71257592	89.62287878	87.59055301	85.61372189	83.69058079
200417A00002	4/17/2020	0.96	4/17/2025	4/17/2020	100.16916	97.78131462	95.46206173	93.20904983	91.02002067	88.89280663	86.82532656	84.81558177	82.86165219
200511A00006	5/11/2020	1.65	5/13/2030	5/11/2020	105.9126	98.69693614	92.02254968	85.84608002	80.12784647	74.83152032	69.92382592	65.37426976	61.15489493
220617A00027	6/17/2022	3.45	6/17/2024	6/17/2022	103.98921	102.3646807	100.7733837	99.21436744	97.68671275	96.18953522	94.72198356	93.2832381	91.8725092
220701A00049	7/1/2022	3.19	7/1/2025	7/1/2022	106.18555	103.5215774	100.938323	98.43282894	96.00226872	93.64393864	91.35525177	89.13373189	86.9770079
200413A00011	4/13/2020	0.94	4/12/2024	4/13/2020	99.863378	98.44737592	97.05820227	95.6951623	94.35758465	93.04482052	91.75624262	90.49124437	89.24923898
200415A00026	4/15/2020	0.77	4/14/2023	4/15/2020	100.0112	99.55773212	99.10837616	98.66307193	98.22176472	97.78440083	97.35092748	96.92129285	96.49544605
220315A00014	3/15/2022	2.78	3/15/2032	3/15/2022	115.5607	106.3284912	97.92529435	90.27191104	83.29709579	76.93672078	71.13303223	65.83398771	60.99266536
200327A00061	3/31/2020	1.18	3/31/2025	3/31/2020	100.68947	98.33973717	96.05622246	93.83670188	91.67903549	89.58116748	87.54112236	85.5570013	83.62697872
200415A00038	4/15/2020	1.37	4/15/2027	4/15/2020	103.21347	98.89033349	94.77181172	90.84718944	87.10636844	83.53982741	80.13858602	76.89417139	73.79858688
200428A00002	4/28/2020	1.47	4/26/2030	4/28/2020	105.63023	98.42058013	91.75077429	85.57767661	79.86180402	74.56699883	69.66013318	65.11084108	60.89127543
201116A00009	11/16/2020	0.51	11/14/2022	11/16/2020	100.02278	99.98398712	99.94523642	99.906532	99.86787379	99.82926168	99.79069561	99.75217548	99.71370122
210526A00014	5/26/2021	1.01	12/19/2025	5/26/2021	100.5725	97.54513847	94.62365528	91.80374352	89.08129956	86.45241143	83.91334856	81.46055215	79.09062606
200310A00020	3/10/2020	1.1	3/10/2025	3/10/2020	100.47862	98.18486743	95.95440697	93.78515756	91.675115	89.62235213	87.62501541	85.68132166	83.78955501
220329A00007	3/29/2022	2.94	3/29/2029	3/29/2022	114.00631	107.5476765	101.5037231	95.84560905	90.54664548	85.58212062	80.92914373	76.56650225	72.47453087
220729A00045	7/29/2022	3.03	7/29/2027	7/29/2022	111.27721	106.4979776	101.9544886	97.63380364	93.5237664	89.61295344	85.89062546	82.34668225	78.97162087

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200325A00048	3/25/2020	1.34	12/27/2022	3/25/2020	100.18027	100.0223933	99.86501347	99.70813285	99.55174908	99.39585982	99.24046275	99.08555554	98.9311359
200527A00015	5/27/2020	0.99	11/26/2025	5/27/2020	100.4741	97.50709862	94.64229226	91.87559352	89.2031031	86.62110023	84.12603336	81.71451131	79.38329507
210714A00020	7/14/2021	0.9	3/14/2025	7/14/2021	100.0071	97.70884378	95.47430725	93.30137968	91.18803518	89.13232608	87.13237945	85.18639375	83.29263574
220121A00014	1/21/2022	1.78	11/3/2025	1/21/2022	102.81174	99.86985458	97.02746639	94.2806649	91.62571797	89.05906083	86.57728757	84.17714306	81.8555154
221027A00004	10/27/2022	4.76	10/28/2024	10/27/2022	107.63169	105.6171021	103.6510211	101.731976	99.85854973	98.02937771	96.24314563	94.49858713	92.79448173
200327A00066	6/25/2020	0.93	6/26/2023	6/25/2020	99.996014	99.34559586	98.7035997	98.06986323	97.44422796	96.8265394	96.21664698	95.61440392	95.01966708
211123A00011	11/23/2021	1.69	11/23/2026	11/23/2021	104.05662	100.0881628	96.29266369	92.66167351	89.18720374	85.86169722	82.67800235	79.62934908	76.70932639
220915A00035	9/15/2022	4.2	3/17/2025	9/15/2022	107.86918	105.4682904	103.1335584	100.8627998	98.65391123	96.50487066	94.41373391	92.37863114	90.3977635
200302A00003	3/2/2020	1.2	3/2/2023	3/2/2020	100.21478	99.87802439	99.54352692	99.21126333	98.88121133	98.55334894	98.22765444	97.90410642	97.58268373
210104A00012	12/20/2021	0.89	12/18/2026	12/20/2021	100.86592	96.8983025	93.10672997	89.48246418	86.0172527	82.70329604	79.5332202	76.50005088	73.59718952
210305A00005	3/9/2021	0.54	8/11/2023	3/9/2021	99.626818	98.855117	98.09530397	97.34710628	96.61025925	95.88450617	95.16959804	94.46529324	93.7713573
220217A00020	2/17/2022	2.08	2/13/2025	2/17/2022	102.69114	100.4397057	98.24857707	96.11575266	94.03931269	92.0174147	90.04828973	88.13023884	86.26162973
220331A00003	3/31/2022	2.66	5/17/2024	3/31/2022	102.54271	101.0131668	99.51397141	98.04429201	96.60332524	95.19029652	93.80445873	92.44509101	91.11149757
221031A00033	10/31/2022	4.74	10/31/2025	10/31/2022	111.6817	108.6139293	105.6485431	102.7815512	100.0091395	97.32766444	94.73364378	92.22374873	89.79479617
201030A00017	10/30/2020	1.14	10/15/2027	10/30/2020	102.47237	97.70224847	93.18013257	88.89190206	84.82430806	80.96491748	77.30205881	73.8247716	70.52275967
200304A00012	3/4/2020	0.98	3/4/2025	3/4/2020	100.49225	98.20741555	95.98535612	93.82401342	91.72140835	89.67563755	87.68487	85.74734391	83.86136363
200402A00036	4/2/2020	0.71	4/2/2024	4/2/2020	99.702283	98.31132704	96.94628297	95.60649113	94.29131382	93.00013435	91.73235619	90.48740211	89.26471343
210616A00009	2/11/2022	0.86	2/11/2025	2/11/2022	99.888485	97.67541836	95.52168378	93.42530455	91.38438518	89.39710706	87.46172476	85.57656242	83.74001039
210624A00004	6/24/2021	1.01	6/24/2025	6/24/2021	100.35719	97.7901981	95.3011076	92.88707706	90.54538552	88.27342981	86.06871848	83.92886617	81.85158825
220301A00013	3/1/2022	2.01	2/16/2027	3/1/2022	105.73311	101.5082032	97.47587539	93.62634297	89.95037312	86.43924867	83.08473639	79.87905749	76.81485999
220325A00017	3/28/2022	2.86	3/23/2027	3/28/2022	109.66419	105.2596811	101.0590191	97.05171975	93.22789143	89.57819822	86.09382604	82.76645084	79.58820885
220613A00030	6/13/2022	3.08	6/13/2023	6/13/2022	101.35428	100.7339795	100.1212777	99.51603107	98.91810389	98.32736381	97.74368164	97.16693127	96.59698958
200302A00060	3/2/2021	1.44	3/3/2025	3/2/2021	101.26989	98.98453927	96.76173777	94.59944295	92.49568853	90.44858326	88.45630754	86.51711034	84.62930621
201015A00025	10/19/2020	1.54	10/18/2027	10/19/2020	104.44941	99.62347802	95.04811812	90.70905988	86.59291616	82.68712482	78.97989373	75.46014972	72.11749115
210330A00024	3/30/2021	0.68	3/29/2024	3/30/2021	99.495811	98.11956578	96.76873896	95.44268887	94.14079503	92.86245718	91.60709449	90.37414474	89.16306361
210917A00012	9/17/2021	1.2	9/11/2026	9/17/2021	101.8691	98.13211915	94.55136425	91.11953097	87.82969441	84.67528634	81.65007499	78.7481461	75.96388518
220422A00014	4/22/2022	3.36	9/29/2026	4/22/2022	110.34648	106.3977099	102.6140499	98.98773211	95.51139597	92.17806339	88.9811169	85.91427914	82.97159357
200330A00007	3/30/2020	0.93	4/1/2024	3/30/2020	99.849417	98.46274895	97.10182236	95.76598442	94.45460356	93.16706894	91.90278959	90.66119357	89.44172728
211214A00015	12/14/2021	1.49	12/12/2025	12/14/2021	102.05626	99.02347527	96.09605279	93.26973199	90.54045234	87.90434171	85.35770637	82.89702159	80.51892274
220324A00007	3/24/2022	2.72	3/24/2025	3/24/2022	104.3801	102.0032204	99.69256945	97.44593612	95.26119787	93.13631494	91.06932668	89.05834794	87.10156573
210121A00014	1/22/2021	0.64	10/25/2024	1/22/2021	99.387188	97.46458322	95.58848281	93.75747802	91.97021217	90.22537867	88.52171881	86.85801959	85.23311184
211206A00017	12/6/2021	1.56	12/4/2026	12/6/2021	103.57299	99.58560357	95.77313861	92.12699994	88.63906061	85.30163549	82.10745464	79.04963858	76.12167498
220808A00025	8/8/2022	3.25	8/6/2027	8/8/2022	112.37295	107.5468997	102.9595186	98.59768832	94.4490836	90.50212146	86.74591224	83.17021403	79.76539041

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200316A00071	3/16/2020	1.18	3/16/2023	3/16/2020	100.20597	99.83098068	99.45880272	99.08940405	98.72275353	98.35882048	97.99757467	97.63898634	97.28302614
210907A00007	9/7/2021	2.35	9/4/2037	9/7/2021	113.2068	99.6847515	87.98277765	77.84339136	69.04684055	61.4054109	54.75861134	48.96910319	43.91925512
200414A00015	4/14/2020	0.64	4/14/2023	4/14/2020	99.992393	99.53850291	99.08873072	98.64302006	98.20131598	97.76356454	97.32971274	96.89970853	96.47350082
210122A00005	1/26/2021	0.6	7/15/2024	1/26/2021	99.317618	97.65934643	96.03623378	94.44722613	92.89131217	91.36752081	89.87491913	88.41261048	86.97973268
220124A00007	1/24/2022	1.88	1/22/2027	1/24/2022	105.09649	100.952367	96.99452362	93.21356651	89.60062764	86.1473356	82.84578464	79.68850583	76.66844022
220125A00008	1/25/2022	1.31	1/26/2024	1/25/2022	100.31584	99.09665265	97.90690354	96.7455341	95.6115391	94.50396027	93.42188358	92.36443671	91.33078673
220506A00016	5/6/2022	3.35	5/6/2027	5/6/2022	112.12001	107.5453339	103.1869833	99.03356632	95.07435338	91.29923303	87.69867325	84.26368506	80.98578877
220920A00024	9/20/2022	4.25	9/19/2025	9/20/2022	109.79683	106.8693139	104.0362546	101.2940987	98.63944525	96.06903958	93.57976581	91.16864028	88.83280514
200331A00014	3/31/2020	0.72	3/29/2024	3/31/2020	99.719062	98.33846584	96.98340542	95.65323557	94.34733205	93.06509105	91.80592834	90.56927846	89.35459399
220817A00038	10/14/2022	3.41	10/15/2027	10/14/2022	113.65707	108.6136247	103.8283207	99.28656913	94.97468278	90.87981341	86.98989604	83.2935972	79.78026693
200218A00030	2/21/2020	1.71	2/24/2023	2/21/2020	100.37748	100.0568216	99.73820869	99.42162262	99.10704409	98.79445407	98.48383377	98.1751646	97.86842826
200225A00023	2/25/2020	1.62	2/25/2025	2/25/2020	101.67518	99.40126433	97.18915242	95.03682708	92.94234564	90.90384008	88.91951377	86.98763826	85.10655025
200305A00045	3/5/2020	0.99	3/6/2023	3/5/2020	100.14098	99.7934507	99.4483329	99.10560122	98.76523096	98.42719772	98.09147746	97.75804648	97.42688137
200310A00028	3/10/2020	1.1	3/10/2025	3/10/2020	100.47862	98.18486743	95.95440697	93.78515756	91.675115	89.62235213	87.62501541	85.68132166	83.78955501
210218A00010	2/18/2021	1.72	2/18/2031	2/18/2021	106.2702	98.36679698	91.10917532	84.44126133	78.31211697	72.67544452	67.48914252	62.7149061	58.31786734
211015A00031	10/15/2021	1.22	10/15/2025	10/15/2021	101.09414	98.22654551	95.45463861	92.77471903	90.18324921	87.67684754	85.25228058	82.90645565	80.63641392
200304A00033	3/4/2020	1.17	3/4/2025	3/4/2020	100.63798	98.35760021	96.13974424	93.98236805	91.88350373	89.84125853	87.8538115	85.9194104	84.03636865
220126A00002	1/26/2022	1.9	12/18/2026	1/26/2022	105.02383	100.9709135	97.09676224	93.39253513	89.84987521	86.46088343	83.21809084	80.11443267	77.14322405
220331A00012	3/31/2022	2.81	3/17/2025	3/31/2022	104.55793	102.1970571	99.90148977	97.66906322	95.49769866	93.38539785	91.33023942	89.33037549	87.3840284
220511A00015	5/11/2022	3.29	5/11/2027	5/11/2022	111.88993	107.3071409	102.9416382	98.78195246	94.81728122	91.03744611	87.43285347	83.99445764	80.71372669
200403A00017	4/3/2020	0.81	4/3/2023	4/3/2020	100.04467	99.62099478	99.20090067	98.78433761	98.37126124	97.96162797	97.55539491	97.15251989	96.75296143
210226A00004	3/1/2021	1.04	12/5/2025	3/1/2021	100.64328	97.65042095	94.76124464	91.97157698	89.27743791	86.67503102	84.16073388	81.73108886	79.38279461
200316A00049	3/16/2020	1.25	3/14/2025	3/16/2020	100.83801	98.52974939	96.28541691	94.10290123	91.9801703	89.91527054	87.90632333	85.95152165	84.04912697
210121A00012	1/22/2021	0.64	10/15/2024	1/22/2021	99.389408	97.49220192	95.64029374	93.83232924	92.06700378	90.34306016	88.65928662	87.01451481	85.407618
220222A00018	2/22/2022	2.5	12/19/2031	2/22/2022	112.91813	104.0132275	95.89268141	88.48299687	81.71793113	75.53774121	69.88851541	64.72157667	59.9929498
220224A00023	2/24/2022	2.15	3/16/2026	2/24/2022	104.5873	101.2643547	98.06464174	94.98296381	92.01436744	89.15413286	86.39776172	83.74096554	81.17965478
220225A00015	2/25/2022	2.26	2/25/2027	2/25/2022	106.85899	102.584344	98.50533737	94.6120203	90.89500383	87.34542089	83.95489464	80.71550894	77.6197806
220428A00019	4/28/2022	3.27	4/28/2027	4/28/2022	111.69789	107.1539128	102.824067	98.69712218	94.76249387	91.01020518	87.43084849	84.01555009	80.755937
220812A00001	8/12/2022	3.17	8/12/2027	8/12/2022	112.73509	107.8629667	103.2330173	98.83188569	94.64702862	90.66665847	86.87969358	83.27571205	79.84490871
200225A00029	2/25/2020	1.89	12/28/2029	2/25/2020	107.62712	100.6861399	94.24104203	88.2538211	82.68957218	77.51622387	72.70429426	68.2266691	64.05840011
200407A00019	4/7/2020	1.06	4/8/2024	4/7/2020	100.03717	98.63048213	97.25024975	95.89579183	94.56645102	93.26159184	91.98059975	90.72288032	89.4878584
200629A00020	6/29/2020	1.4	6/28/2030	6/29/2020	104.0107	96.75347357	90.05002527	83.85531469	78.12818098	72.83099179	67.9293237	63.39167327	59.18919544
200108A00016	12/18/2020	1.98	12/18/2023	12/18/2020	101.04269	99.92169799	98.82548896	97.75324491	96.70418648	95.67756778	94.6726746	93.6888228	92.72535666

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200312A00015	3/12/2020	1.23	3/10/2025	3/12/2020	100.78584	98.48839539	96.25432898	94.0815499	91.96805172	89.9119051	87.91125441	85.96431448	84.06936748
200916A00015	9/16/2020	0.72	9/16/2025	9/16/2020	99.605045	96.83355323	94.15241113	91.55820971	89.04768713	86.61772149	84.26532408	81.98763292	79.7819067
220617A00026	6/17/2022	3.36	12/18/2023	6/17/2022	102.6167	101.4861858	100.3805955	99.29911298	98.24095538	97.20537325	96.19164903	95.19909529	94.2270532
220826A00015	8/26/2022	3.64	8/25/2023	8/26/2022	102.15324	101.3329425	100.5258263	99.73157717	98.94988899	98.18046522	97.4230186	96.6772708	95.94295206
210721A00009	7/21/2021	1.7	7/21/2031	7/21/2021	105.95445	97.70376899	90.15774091	83.25251509	76.93033951	71.13894574	65.83100209	60.96362397	56.49793514
220106A00009	1/6/2022	2.57	1/4/2036	1/6/2022	115.72907	103.3163906	92.40594175	82.80596576	74.35016518	66.89420401	60.31270592	54.49667602	49.35128449
220630A00057	6/30/2022	3.34	6/30/2025	6/30/2022	106.57887	103.9122274	101.3262755	98.8180653	96.38477393	94.02370132	91.73226373	89.50798791	87.34850549
200316A00050	3/16/2020	1.54	3/16/2027	3/16/2020	103.86913	99.60836773	95.54561403	91.67068384	87.97396774	84.4463954	81.07940258	77.86490044	74.79524676
200324A00012	3/25/2020	1.78	3/25/2025	3/25/2020	102.12562	99.77363256	97.48742124	95.26478466	93.10361086	91.00187038	88.95761254	86.96896187	85.0341148
200417A00014	4/17/2020	0.96	4/17/2025	4/17/2020	100.16916	97.78131462	95.46206173	93.20904983	91.02002067	88.89280663	86.82532656	84.81558177	82.86165219
200504A00006	5/4/2020	0.94	5/5/2025	5/4/2020	100.13162	97.6974628	95.33446582	93.04013982	90.81210006	88.64805955	86.54582439	84.5032894	82.51843387
210907A00014	9/9/2021	2.45	9/9/2026	9/9/2021	106.67172	102.8476847	99.18224794	95.66802517	92.29801627	89.06558053	85.9644164	82.9885424	80.13227929
220527A00011	5/27/2022	2.75	5/24/2024	5/27/2022	102.70451	101.1554964	99.63740795	98.14938952	96.69061438	95.26028577	93.8576355	92.48192271	91.1324326
210826A00009	8/26/2021	1.18	8/26/2026	8/26/2021	101.74786	98.05448635	94.51393696	91.11911896	87.86330749	84.74012269	81.74351019	78.86772276	76.10730312
210920A00015	9/9/2022	1.28	9/9/2026	9/9/2022	102.17108	98.4334953	94.85188973	91.41898091	88.12786483	84.97199252	81.94515	79.04143946	76.25526156
200225A00035	10/5/2020	1.5	10/5/2023	10/5/2020	100.40423	99.48293382	98.57846479	97.69036583	96.8181958	95.96152925	95.11995579	94.29307937	93.48051772
200324A00066	3/26/2020	1.81	3/26/2025	3/26/2020	102.20049	99.84502512	97.55549489	95.32968973	93.16549066	91.06086155	89.01384537	87.02256066	85.08519815
200330A00017	3/30/2020	0.86	3/30/2023	3/30/2020	100.07078	99.65792581	99.2484625	98.84234938	98.43954554	98.04001073	97.64370537	97.25059049	96.86062777
200826A00029	8/28/2020	1.16	11/27/2024	8/28/2020	100.47506	98.45392573	96.48313846	94.56110981	92.68631656	90.85729443	89.07263535	87.33098481	85.63103942
210104A00010	11/22/2021	0.88	11/20/2026	11/22/2021	100.77016	96.87586584	93.1518246	89.5897116	86.181658	82.92021963	79.79835169	76.80938507	73.94700422
211026A00013	10/26/2021	1.52	10/26/2026	10/26/2021	103.26117	99.38207139	95.66962409	92.11581115	88.71304365	85.45413549	82.33227987	79.34102723	76.47426456
200318A00038	3/18/2020	1.48	3/18/2025	3/18/2020	101.39146	99.06630406	96.80577036	94.60771115	92.4700649	90.39084999	88.36816119	86.40016618	84.48510241
211129A00011	11/29/2021	1.53	11/20/2026	11/29/2021	103.3969	99.4496823	95.67437768	92.06260227	88.60642408	85.29833875	82.13124408	79.09841623	76.19348741
220106A00013	1/6/2022	2.75	1/6/2039	1/6/2022	118.62893	103.743205	90.99684522	80.06566841	70.67639502	62.598417	55.63693368	49.62722149	44.42984568
220323A00017	6/2/2022	2.78	6/2/2025	6/2/2022	104.91822	102.3495799	99.85711911	97.43811668	95.08996761	92.81017679	90.59635354	88.44620649	86.35753871
200226A00004	2/26/2020	1.58	2/26/2025	2/26/2020	101.58528	99.30956618	97.09578292	94.94190895	92.84599962	90.80618475	88.82066537	86.88771052	85.00565428
200304A00018	3/4/2020	0.98	3/4/2025	3/4/2020	100.49225	98.20741555	95.98535612	93.82401342	91.72140835	89.67563755	87.68487	85.74734391	83.86136363
200327A00041	3/27/2020	0.9	3/27/2023	3/27/2020	100.09018	99.68545905	99.28399847	98.88576334	98.49071493	98.09881513	97.71002642	97.32431189	96.94163521
200928A00009	9/28/2020	1.51	9/28/2032	9/28/2020	103.66974	94.53182412	86.27125225	78.79932738	72.03672161	65.91244891	60.36295135	55.33128926	50.76642325
220315A00015	3/15/2022	3.18	3/13/2037	3/15/2022	124.39727	110.4824427	98.36066553	87.7872573	78.55225822	70.4753433	63.40149973	57.19735349	51.74804518
220819A00034	8/19/2022	3.73	8/19/2032	8/19/2022	124.87395	114.8316189	105.7155123	97.43433365	89.90625439	83.05789022	76.82338953	71.14362421	65.96547124
200320A00049	3/25/2020	1.47	3/25/2025	3/25/2020	101.3804	99.03749603	96.76017426	94.54623717	92.39357844	90.30017405	88.26407852	86.28342145	84.35640408
200424A00014	4/28/2020	1.01	4/23/2025	4/28/2020	100.29759	97.89243268	95.55680513	93.28830153	91.08461856	88.94354603	86.86296256	84.84083134	82.87519632

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200826A00021	8/26/2020	0.83	8/26/2025	8/26/2020	99.907107	97.18557958	94.55112107	92.0004862	89.53056916	87.13839678	84.82112203	82.57601791	80.40047173
201019A00005	10/19/2020	0.79	10/20/2025	10/19/2020	99.82479	96.96355246	94.19836806	91.52550176	88.94138487	86.44260683	84.02590728	81.68816851	79.42640841
210304A00002	3/5/2021	0.93	7/10/2025	3/5/2021	100.15714	97.55159641	95.02617595	92.57790994	90.20396121	87.90161754	85.66828518	83.50148265	81.39883505
210610A00012	6/11/2021	1.9	6/10/2026	6/11/2021	104.1332	100.5939588	97.19384058	93.9266156	90.78636882	87.767483	84.86462182	82.07271414	79.38693914
211210A00016	12/10/2021	1.76	12/10/2027	12/10/2021	105.6853	100.6922858	95.96446367	91.48637068	87.24352953	83.22237762	79.41020434	75.79509304	72.36586718
220314A00007	3/14/2022	2.44	3/12/2027	3/14/2022	107.72091	103.3883067	99.25547821	95.31220282	91.54883122	87.95625327	84.52586518	81.24953887	78.11959333
200316A00009	3/16/2020	1.25	3/14/2025	3/16/2020	100.83801	98.52974939	96.28541691	94.10290123	91.9801703	89.91527054	87.90632333	85.95152165	84.04912697
210218A00009	2/19/2021	0.62	7/15/2024	2/19/2021	99.351916	97.69334135	96.06993085	94.48063068	92.92442941	91.40035578	89.90747675	88.44489554	87.01174984
210225A00015	3/1/2021	0.7	8/26/2024	3/1/2021	99.495396	97.72736018	95.99883415	94.30869224	92.65584836	91.03925463	89.45789971	87.91080731	86.3970347
220715A00047	7/15/2022	3.44	7/15/2027	7/15/2022	113.1504	108.3627247	103.8090429	99.47660923	95.3534493	91.42830463	87.6905856	84.13032768	80.73815096
200402A00048	4/2/2020	0.71	4/2/2024	4/2/2020	99.702283	98.31132704	96.94628297	95.60649113	94.29131382	93.00013435	91.73235619	90.48740211	89.26471343
201216A00013	12/16/2020	0.59	12/16/2025	12/16/2020	99.653175	96.63821661	93.7288316	90.92072497	88.20980406	85.5921673	83.06409396	80.62203454	78.26260173
220427A00011	4/29/2022	3.15	4/29/2027	4/29/2022	111.16923	106.6343144	102.3133828	98.19519906	94.26917676	90.52533751	86.95427284	83.5471086	80.29547185
220519A00010	5/19/2022	3.15	11/19/2026	5/19/2022	109.93524	105.8589963	101.9586027	98.22552676	94.65169321	91.22946059	87.95159568	84.81124934	81.80193396
220714A00035	7/14/2022	3.62	7/15/2024	7/14/2022	104.49666	102.7925799	101.124491	99.49131369	97.89201449	96.325601	94.7911198	93.28765445	91.81432374
220908A00029	9/8/2022	3.88	3/8/2024	9/8/2022	103.88397	102.530419	101.2009594	99.89500041	98.61197178	97.35132117	96.11251356	94.89503059	93.69836988
200327A00056	3/27/2020	1.18	3/27/2025	3/27/2020	100.68533	98.34581594	96.07197193	93.86159657	91.71257592	89.62287878	87.59055301	85.61372189	83.69058079
200330A00036	3/30/2020	0.86	3/30/2023	3/30/2020	100.07078	99.65792581	99.2484625	98.84234938	98.43954554	98.04001073	97.64370537	97.25059049	96.86062777
210526A00017	5/26/2021	2.13	5/26/2033	5/26/2021	109.73108	99.75891593	90.79087714	82.72020245	75.45199833	68.9018634	62.99468068	57.66355416	52.84887191
210610A00014	6/11/2021	2.03	6/10/2026	6/11/2021	104.60131	101.053635	97.64532631	94.37014444	91.22216579	88.19576496	85.2855978	82.4865857	79.79390069
211210A00014	12/10/2021	1.54	12/10/2025	12/10/2021	102.20595	99.17594901	96.25105495	93.42702068	90.69980157	88.06554028	85.52055694	83.06133968	80.68453592
220411A00002	4/11/2022	3.18	4/9/2027	4/11/2022	111.1946	106.7115925	102.4376789	98.3620102	94.47435572	90.76506509	87.22503247	83.84566301	80.61884158
200306A00040	3/6/2020	1.01	3/6/2025	3/6/2020	100.26364	97.98262642	95.76431854	93.60665463	91.50765707	89.46542391	87.47812556	85.54400155	83.66135758
200325A00042	3/25/2020	1.58	3/25/2024	3/25/2020	100.76929	99.39395199	98.04383504	96.7183047	95.41674878	94.13857494	92.88320987	91.65009857	90.43870362
220921A00014	9/21/2022	4.08	9/21/2027	9/21/2022	116.7402	111.6860415	106.8863558	102.326968	97.99456728	93.87664712	89.96145307	86.23793363	82.69569476
200305A00038	3/5/2020	1.51	3/5/2029	3/5/2020	104.92922	98.8128724	93.09065776	87.73523992	82.72130767	78.02541509	73.6258354	69.50242704	65.63651075
201015A00030	10/19/2020	2.39	10/18/2027	10/19/2020	108.64437	103.7157641	99.04154002	94.60725381	90.39935335	86.40512014	82.6126139	79.01062099	75.58860657
210119A00007	1/20/2021	0.51	8/25/2023	1/20/2021	99.571969	98.76330342	97.96768876	97.18481178	96.41436873	95.65606545	94.90961702	94.17474735	93.45118885
210629A00005	6/29/2021	1.25	6/29/2026	6/29/2021	101.85191	98.30381132	94.89725746	91.62582656	88.48342283	85.46426195	82.56285313	79.77398233	77.09269654
210803A00005	8/5/2021	2.06	8/4/2026	8/5/2021	104.98953	101.291369	97.74341806	94.33872946	91.07071946	87.93314732	84.92009502	82.02594852	79.24538006
200518A00019	5/19/2020	0.9	5/19/2025	5/19/2020	100.03847	97.56970053	95.17384249	92.84831421	90.59064418	88.39846374	86.26950211	84.20158159	82.19261318
220204A00005	2/4/2022	1.83	1/10/2025	2/4/2022	102.00504	99.85316342	97.75698118	95.71465571	93.7244238	91.78459471	89.89354649	88.04972259	86.25162861
220920A00025	9/20/2022	4.23	9/18/2026	9/20/2022	113.61842	109.636177	105.8185576	102.1578849	98.6468834	95.27865235	92.04664474	88.94464724	85.9667615

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220622A00006	6/22/2022	3.58	6/22/2027	6/22/2022	113.61113	108.8744722	104.3665397	100.0750252	95.98835196	92.09562698	88.38659609	84.85160308	81.48155139
220920A00015	9/20/2022	4.33	10/21/2024	9/20/2022	106.70231	104.7156829	102.7765079	100.8833597	99.03486381	97.22969588	95.46657997	93.74428624	92.061629
200327A00051	3/27/2020	0.99	3/27/2025	3/27/2020	100.53564	98.19151459	95.91332605	93.69885705	91.54598151	89.45265679	87.41691985	85.43688366	83.51073383
200330A00011	3/30/2020	0.93	4/1/2024	3/30/2020	99.849417	98.46274895	97.10182236	95.76598442	94.45460356	93.16706894	91.90278959	90.66119357	89.44172728
210407A00012	4/7/2021	0.94	4/7/2025	4/7/2021	100.11323	97.75224401	95.45835212	93.2292819	91.06284787	88.95695128	86.90957605	84.91878504	82.98271646
220404A00014	4/4/2022	2.94	4/5/2027	4/4/2022	110.10553	105.6571876	101.416138	97.37164202	93.51357301	89.83237758	86.31904031	82.96505065	79.76237212
220824A00011	8/24/2022	3.7	8/22/2025	8/24/2022	107.97269	105.1470024	102.4105018	99.7598717	97.19193962	94.70366931	92.2921541	89.95461054	87.68837237
220929A00063	9/29/2022	4.38	9/29/2027	9/29/2022	118.28083	113.1673783	108.3119419	103.7001041	99.31832991	95.15390555	91.19488412	87.43003569	83.84880071
200318A00044	3/18/2020	1.17	3/18/2024	3/18/2020	100.35518	98.99833041	97.66611295	96.35791241	95.07313673	93.8112129	92.57158614	91.35371919	90.15709166
200331A00011	3/31/2020	1.09	3/31/2025	3/31/2020	100.47165	98.12458785	95.84368752	93.62672515	91.47156244	89.37614523	87.33849954	85.35672806	83.42900664
200408A00013	4/13/2020	0.87	4/14/2023	4/13/2020	100.05696	99.6033751	99.15389584	98.70846912	98.26704022	97.82955542	97.39596195	96.96620798	96.5402426
200421A00028	4/21/2020	0.56	4/21/2023	4/21/2020	99.943006	99.47023402	99.00192631	98.53802018	98.07845372	97.62316618	97.17209795	96.72519051	96.28238644
201216A00003	12/16/2020	0.59	7/1/2024	12/16/2020	99.319465	97.69692565	96.10821553	94.55234123	93.02834798	91.53531807	90.07236904	88.63865194	87.23334972
210310A00015	3/11/2021	0.51	5/15/2023	3/11/2021	99.821979	99.28515446	98.75408851	98.22868867	97.70886452	97.19452759	96.68559125	96.18197071	95.68358293
210315A00003	3/15/2021	1.13	3/13/2026	3/15/2021	101.14526	97.88798619	94.75181642	91.73163811	88.82258368	86.02001491	83.31951097	80.71685698	78.20803346
210907A00008	9/7/2021	2.42	9/7/2038	9/7/2021	113.90314	99.60133854	87.33332877	76.79512972	67.72977862	59.91984732	53.18118076	47.35765335	42.31677365
200327A00048	3/27/2020	1.18	3/24/2025	3/27/2020	100.68221	98.35037066	96.0837845	93.88027452	91.73774611	89.65418642	87.62766065	85.65630856	83.73834114
200402A00035	4/2/2020	0.62	4/3/2023	4/2/2020	100.00148	99.57747751	99.1570612	98.74018429	98.32680224	97.91687123	97.5103482	97.10719079	96.70735733
200403A00025	4/3/2020	0.91	4/3/2024	4/3/2020	99.820631	98.42886195	97.06302679	95.72246522	94.40653865	93.11462949	91.84614034	90.60049314	89.37712838
210707A00008	7/9/2021	2.44	7/7/2031	7/9/2021	112.26233	103.7800423	96.01278289	88.89631739	82.37250059	76.38867064	70.8971055	65.85453601	61.22170916
220131A00003	1/31/2022	1.98	2/1/2027	1/31/2022	105.56496	101.3851119	97.39407592	93.5822813	89.94069833	86.46080549	83.13455758	79.95435605	76.91302147
210629A00014	6/29/2021	1.78	12/28/2029	6/29/2021	106.84981	99.93586348	93.51643429	87.55359606	82.01252106	76.86120985	72.0702476	67.61258267	63.46332523
211028A00021	10/28/2021	2.28	10/28/2033	10/28/2021	111.3948	100.9904944	91.6680681	83.30873513	75.8073264	69.07066899	63.01616354	57.57053659	52.66874556
220512A00013	5/12/2022	3.18	5/12/2027	5/12/2022	111.40203	106.8275241	102.4701558	98.3184551	94.36161873	90.58946811	86.99240975	83.56139854	80.28790342
201030A00012	10/30/2020	0.63	10/30/2025	10/30/2020	99.731282	96.83735858	94.04162662	91.34022684	88.72947397	86.20584793	83.76598533	81.40667163	79.12483358
211214A00012	12/14/2021	0.64	12/14/2022	12/14/2021	100.06272	99.94091225	99.81941373	99.69822537	99.57734594	99.45677423	99.33650905	99.21654918	99.09689344
220315A00036	3/17/2022	2.63	3/16/2027	3/17/2022	108.6153	104.2517096	100.0895662	96.11854242	92.32889221	88.71141507	85.25742299	81.95870925	78.80751944
220715A00027	7/15/2022	3.44	7/15/2027	7/15/2022	113.1504	108.3627247	103.8090429	99.47660923	95.3534493	91.42830463	87.6905856	84.13032768	80.73815096
221014A00031	10/14/2022	4.89	4/12/2024	10/14/2022	105.6234	104.1636396	102.7314591	101.3261457	99.94700823	98.59337876	97.26461165	95.96008259	94.67918772
200306A00066	3/6/2020	1.2	3/8/2027	3/6/2020	102.32711	98.1210804	94.11002706	90.28395926	86.63344609	83.14958352	79.82396233	76.64863821	73.61610379
200527A00014	5/27/2020	1.06	5/27/2026	5/27/2020	101.07334	97.62558525	94.3127879	91.12894591	88.06835754	85.12560553	82.29554116	79.57326938	76.95413477
201119A00002	11/19/2020	0.5	11/18/2022	11/19/2020	100.02879	99.97891476	99.92910073	99.87935169	99.82966753	99.78004812	99.73049334	99.68100305	99.63157714
210719A00009	7/19/2021	1.04	7/17/2026	7/19/2021	101.12512	97.54478582	94.10903677	90.81122506	87.64505245	84.60454698	81.68404389	78.87816772	76.18181562

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210914A00012	9/14/2021	1.18	9/14/2027	9/14/2021	103.3072	98.57339899	94.08209411	89.81967797	85.77337235	81.93117426	78.28180511	74.8146635	71.51978126
200228A00047	5/18/2020	1.35	5/18/2023	5/18/2020	100.27841	99.73204539	99.19162175	98.6570451	98.12822083	97.60505637	97.08746111	96.57534639	96.06862541
210121A00017	1/25/2021	0.48	5/25/2023	1/25/2021	99.781588	99.21791941	98.66059259	98.10950127	97.56454128	97.02561077	96.49261012	95.9654419	95.44401082
220217A00017	2/17/2022	2.27	1/29/2027	2/17/2022	106.77688	102.5794736	98.57102833	94.74198565	91.0833271	87.58654113	84.24359134	81.04688688	77.98925501
221006A00097	10/6/2022	4.58	10/7/2024	10/6/2022	107.05065	105.0975145	103.1901838	101.3273028	99.50756794	97.72972298	95.99255639	94.29489963	92.63562531
201216A00001	12/16/2020	0.49	7/14/2023	12/16/2020	99.66147	98.96416295	98.27656704	97.59848037	96.92970674	96.27005528	95.61934033	94.97738123	94.34400216
220216A00003	2/16/2022	2.49	12/14/2029	2/16/2022	111.83548	104.7830685	98.2291923	92.13593146	86.468437	81.19467085	76.28516519	71.71280366	67.45262218
221018A00030	10/18/2022	4.71	10/17/2025	10/18/2022	111.43686	108.4099785	105.482948	102.6519256	99.91323429	97.26335882	94.69893787	92.21675633	89.81373805
200312A00014	3/12/2020	1.04	3/12/2025	3/12/2020	100.64129	98.33420791	96.09103103	93.90964196	91.78801014	89.72418339	87.71628441	85.76250747	83.86111524
220727A00027	7/27/2022	3.23	7/27/2027	7/27/2022	112.20607	107.4103201	102.8506074	98.51399074	94.38831781	90.46216775	86.72480269	83.16612287	79.77662488
220811A00021	8/11/2022	3.47	8/11/2025	8/11/2022	107.2425	104.456209	101.7571191	99.14197377	96.60765711	94.15119023	91.76972407	89.46053275	87.22100737
220825A00022	8/25/2022	3.68	8/25/2025	8/25/2022	107.941	105.1078205	102.3642951	99.70709327	97.13302896	94.63905233	92.22224294	89.87980349	87.60905387
220929A00041	9/29/2022	4.38	9/29/2027	9/29/2022	118.28083	113.1673783	108.3119419	103.7001041	99.31832991	95.15390555	91.19488412	87.43003569	83.84880071
221031A00061	10/31/2022	4.94	4/30/2024	10/31/2022	105.89269	104.3817062	102.9001825	101.4473327	100.0223963	98.62463952	97.25335361	95.90785403	94.58747936
221026A00022	10/26/2022	4.84	10/26/2023	10/26/2022	103.74607	102.7512785	101.7756459	100.8186203	99.87967228	98.95829223	98.05398953	97.16629174	96.29474368
210218A00011	2/22/2021	0.85	10/24/2025	2/22/2021	100.00548	97.13150099	94.35431434	91.67014051	89.07537167	86.56656049	84.14041198	81.79377587	79.52363937
200114A00017	1/11/2021	1.93	1/11/2024	1/11/2021	101.05042	99.86594254	98.70911727	97.57898462	96.47462891	95.39517597	94.33979073	93.30767509	92.29806594
210629A00009	6/29/2021	1.14	12/31/2025	6/29/2021	101.00294	97.93824599	94.98153618	92.12837968	89.37455851	86.71605368	84.14903438	81.66984789	79.27500999
220114A00009	1/14/2022	1.74	4/21/2026	1/14/2022	103.34828	99.95293908	96.68717009	93.54535085	90.52213258	87.61242628	84.81138871	82.11440907	79.51709662
220419A00012	4/19/2022	2.21	4/19/2023	4/19/2022	100.68272	100.2138201	99.7492859	99.28905832	98.83307756	98.38128493	97.93362285	97.49003475	97.05046514
200306A00087	3/8/2021	1.26	3/7/2025	3/8/2021	100.85297	98.56237013	96.33476016	94.16806799	92.06030547	90.00956061	88.01399422	86.0718367	84.18138502
200402A00013	4/2/2020	0.89	4/2/2024	4/2/2020	99.792125	98.40322586	97.04015914	95.70226813	94.3889179	93.09949439	91.83340354	90.59007049	89.36893882
221011A00114	10/11/2022	4.66	8/12/2024	10/11/2022	106.5866	104.7892831	103.0311857	101.3111479	99.62805595	97.98083859	96.36846514	94.78994348	93.24431821
221019A00008	10/19/2022	4.8	10/17/2025	10/19/2022	111.7035	108.6726368	105.7417287	102.9069244	100.1645435	97.5110679	94.94313335	92.45752199	90.05115502
200225A00041	10/30/2020	1.48	10/30/2023	10/30/2020	100.4057	99.41816357	98.44994376	97.50048235	96.56923871	95.65569281	94.75934421	93.87971121	93.01632992
200826A00035	8/28/2020	0.78	8/28/2023	8/28/2020	99.790169	98.97254536	98.1682372	97.37692203	96.5982873	95.83203041	95.07785831	94.33548714	93.60464184
210217A00008	2/18/2021	0.63	8/15/2024	2/18/2021	99.367526	97.62901207	95.92880795	94.26578975	92.63887584	91.04702522	89.4892356	87.96454164	86.47201319
220421A00014	4/21/2022	3.24	5/30/2025	4/21/2022	106.08892	103.5130156	101.0132223	98.58683058	96.23124593	93.9439828	91.72265937	89.56499235	87.46879231
200316A00042	3/16/2020	1.23	3/15/2024	3/16/2020	100.27453	98.92864187	97.60701892	96.30906433	95.03419828	93.78185945	92.55150424	91.34260611	90.1546549
220913A00005	9/13/2022	4.09	9/13/2024	9/13/2022	105.86989	103.9932056	102.1592171	100.366707	98.61449608	96.90144599	95.22645778	93.58847024	91.98645831
200108A00015	12/18/2020	1.98	12/18/2023	12/18/2020	101.04269	99.92169799	98.82548896	97.75324491	96.70418648	95.67756778	94.6726746	93.6888228	92.72535666
200429A00061	4/29/2020	1.66	10/29/2029	4/29/2020	105.98453	99.24863241	92.98568016	87.16006862	81.73904213	76.69245529	71.99255267	67.61376804	63.53254144
220901A00033	9/1/2022	3.72	9/1/2027	9/1/2022	114.82055	109.8672577	105.1613794	100.689264	96.4380784	92.39575759	88.55095511	84.89299664	81.41183693

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
211207A00017	12/7/2021	1.3	11/15/2024	12/7/2021	100.7424	98.75050308	96.80770336	94.91247994	93.06336608	91.25895084	89.49787654	87.77883634	86.10057192
220421A00012	4/21/2022	3.31	4/21/2026	4/21/2022	108.78945	105.2996541	101.942071	98.71097957	95.60094013	92.60677679	89.7235631	86.9466086	84.27144626
200325A00046	3/25/2020	1.76	3/25/2025	3/25/2020	102.07754	99.72613988	97.44050208	95.21842675	93.05780231	90.95659965	88.91286841	86.92473345	84.99039153
200325A00009	3/27/2020	1.67	3/27/2025	3/27/2020	101.86592	99.51198713	97.2240307	94.99984507	92.83730733	90.73437765	88.68909555	86.69957633	84.76400767
210318A00007	3/22/2021	1.41	3/21/2024	3/22/2021	100.52714	99.16392155	97.82553039	96.51135145	95.22078572	93.95325351	92.70819361	91.48506262	90.28333422
210624A00005	6/24/2021	1.22	6/24/2026	6/24/2021	101.72716	98.19446824	94.80230504	91.54431106	88.41445184	85.40700017	82.51651847	79.73784226	77.06606479
220623A00005	6/23/2022	3.45	6/23/2027	6/23/2022	113.01917	108.2933525	103.7960318	99.51489948	95.43838097	91.55558544	87.8562615	84.33075596	80.96997555
200423A00022	4/28/2020	0.76	2/15/2023	4/28/2020	100.07586	99.78052262	99.48693353	99.19507697	98.90493757	98.61650017	98.32974978	98.04467158	97.76125093
201123A00011	11/25/2020	1.41	11/24/2025	11/25/2020	101.75819	98.77665228	95.89750107	93.1166481	90.43019509	87.83442185	85.32577702	82.9008693	80.55645923
200306A00080	11/6/2020	1.12	11/6/2023	11/6/2020	100.04497	99.04086485	98.05679341	97.09215882	96.14639002	95.21893813	94.30927535	93.41689402	92.54130559
200406A00059	4/6/2020	0.92	4/6/2023	4/6/2020	100.08844	99.65650051	99.22828392	98.80373961	98.38282046	97.96548017	97.5516732	97.14135482	96.73448102
220509A00013	7/15/2022	3.37	7/15/2027	7/15/2022	112.82275	108.0426964	103.4963601	99.17101335	95.05469313	91.13615166	87.4048095	83.85071177	80.46448775
220624A00003	6/24/2022	3.5	6/24/2027	6/24/2022	113.25883	108.5247696	104.0196442	99.73111907	95.64759375	91.75815346	88.05252448	84.52103285	81.15456598
200327A00073	3/27/2020	0.99	3/27/2025	3/27/2020	100.53564	98.19151459	95.91332605	93.69885705	91.54598151	89.45265679	87.41691985	85.43688366	83.51073383
220624A00049	6/24/2022	3.29	6/24/2024	6/24/2022	103.99418	102.3467631	100.7333724	99.15301415	97.60473705	96.08762641	94.60080227	93.14341774	91.71465745
220705A00011	7/5/2022	3.14	7/7/2025	7/5/2022	106.09182	103.4133849	100.8165086	98.29819073	95.85556026	93.48587176	91.1864991	88.95492928	86.78875664
220823A00006	8/23/2022	3.66	2/23/2024	8/23/2022	103.47634	102.1625298	100.8735042	99.60858947	98.36713352	97.14850804	95.9521072	94.77734664	93.62366258
221005A00041	10/5/2022	4.3	10/5/2027	10/5/2022	117.94746	112.8259415	107.9637565	103.346367	98.96012627	94.79221818	90.83060239	87.0639635	83.48166374
200305A00016	3/5/2020	0.99	3/6/2023	3/5/2020	100.14098	99.7934507	99.4483329	99.10560122	98.76523096	98.42719772	98.09147746	97.75804648	97.42688137
200417A00004	4/17/2020	0.86	4/17/2024	4/17/2020	99.745482	98.31710616	96.91604135	95.54157429	94.19301564	92.86969939	91.57098188	90.29624082	89.04487447
220831A00079	8/31/2022	3.79	8/29/2025	8/31/2022	108.28499	105.4363243	102.6780682	100.0068691	97.41951885	94.91294537	92.48420587	90.13048076	87.84906782
200305A00037	3/5/2020	1.43	3/6/2028	3/5/2020	104.15225	98.9747809	94.0842547	89.46336505	85.0959316	80.966822	77.06187904	73.36785323	69.87234028
200407A00004	4/7/2020	0.99	4/7/2025	4/7/2020	100.54714	98.17422636	95.86883786	93.62868184	91.45155567	89.33534426	87.27801603	85.27761908	83.33227754
210127A00010	1/27/2021	1.41	7/26/2030	1/27/2021	104.04812	96.72388012	89.96335319	83.72029474	77.95248286	72.62134666	67.6916326	63.13110294	58.91026321
200429A00049	4/29/2020	1.25	4/29/2026	4/29/2020	101.67219	98.285141	95.02843645	91.89637695	88.88354458	85.98478649	83.1952004	80.51012099	77.9251071
210709A00005	7/9/2021	1.69	7/9/2031	7/9/2021	105.88419	97.66387562	90.1434039	83.25956472	76.95516194	71.17841272	65.88240956	61.02463835	56.5665463
211207A00012	12/7/2021	1.62	12/4/2026	12/7/2021	103.81773	99.82536431	96.00808127	92.35727613	88.86481593	85.5230098	82.32458234	79.26264884	76.33069202
220404A00013	4/4/2022	2.1	4/4/2023	4/4/2022	100.59799	100.1701845	99.74601003	99.32542207	98.90837523	98.49482494	98.08472735	97.67803935	97.27471854
221027A00050	10/27/2022	4.52	10/27/2027	10/27/2022	119.2471	114.0347906	109.0889423	104.3944617	99.93718912	95.70383636	91.68192857	87.85975025	84.22629515
200318A00013	3/18/2020	1.5	3/18/2025	3/18/2020	101.43916	99.11342523	96.85232677	94.6537148	92.51552745	90.43578277	88.41257517	86.44407205	84.52851051
200331A00007	3/31/2020	0.72	3/29/2024	3/31/2020	99.719062	98.33846584	96.98340542	95.65323557	94.34733205	93.06509105	91.80592834	90.56927846	89.35459399
211227A00009	12/27/2021	1.6	12/23/2026	12/27/2021	103.80762	99.76686922	95.90513379	92.21352159	88.68363637	85.3075436	82.07774226	78.98713865	76.02902182
220615A00010	6/15/2022	3.86	6/15/2027	6/15/2022	114.78859	110.0457294	105.530704	101.2313079	97.13605726	93.23414301	89.51538745	85.97020383	82.58955868

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220630A00036	6/30/2022	3.42	6/30/2027	6/30/2022	112.93913	108.1960119	103.6830488	99.38780244	95.29857586	91.40436564	87.69481678	84.16018076	80.79127654
220829A00057	8/29/2022	3.67	8/31/2026	8/29/2022	111.27873	107.390734	103.6620525	100.0853378	96.65361648	93.36027047	90.19901712	87.16389051	84.2492239
200304A00002	3/4/2020	0.98	3/4/2025	3/4/2020	100.49225	98.20741555	95.98535612	93.82401342	91.72140835	89.67563755	87.68487	85.74734391	83.86136363
200327A00047	3/27/2020	0.99	3/27/2025	3/27/2020	100.53564	98.19151459	95.91332605	93.69885705	91.54598151	89.45265679	87.41691985	85.43688366	83.51073383
200310A00003	3/10/2020	1.1	3/10/2025	3/10/2020	100.47862	98.18486743	95.95440697	93.78515756	91.675115	89.62235213	87.62501541	85.68132166	83.78955501
200330A00044	3/30/2020	1.09	3/28/2025	3/30/2020	100.46928	98.12986463	95.85619966	93.64607872	91.49738306	89.40807696	87.37620399	85.3998834	83.47730677
210616A00011	5/2/2022	0.95	5/2/2025	5/2/2022	100.15477	97.72799643	95.37201401	93.08435084	90.86264051	88.70461332	86.60809165	84.57098565	82.59128909
220217A00012	2/17/2022	2.28	2/16/2027	2/17/2022	106.88811	102.6386081	98.58249346	94.70995188	91.01171862	87.47904615	84.10367237	80.87779097	77.79402377
220325A00011	3/28/2022	2.79	4/25/2025	3/28/2022	104.72819	102.2619675	99.86680335	97.54024106	95.2799266	93.08360129	90.94909727	88.87433332	86.85731075
220701A00024	7/1/2022	3.08	7/1/2025	7/1/2022	105.89185	103.2318414	100.6524561	98.15074255	95.72387682	93.36915796	91.08400156	88.86593384	86.71258609
220729A00047	7/29/2022	3.06	1/29/2027	7/29/2022	110.11868	105.8508864	101.774352	97.87942589	94.15699982	90.59847679	87.19573903	83.94111822	80.82736773
220907A00010	9/7/2022	3.9	9/9/2032	9/7/2022	128.07238	117.7515223	108.3871261	99.88442419	92.1585264	85.13334553	78.74064302	72.91918234	67.61397751
200306A00022	3/6/2020	1.2	3/8/2027	3/6/2020	102.32711	98.1210804	94.11002706	90.28395926	86.63344609	83.14958352	79.82396233	76.64863821	73.61610379
200327A00030	3/27/2020	1.01	3/27/2024	3/27/2020	99.965276	98.59070302	97.24142815	95.91681451	94.61624633	93.33912786	92.08488254	90.85295227	89.64279666
200330A00038	3/30/2020	1.79	3/29/2030	3/30/2020	106.95278	99.80881606	93.1919712	87.06067212	81.37682288	76.10549612	71.214655	66.67490071	62.45924321
210201A00007	2/3/2021	0.57	8/15/2024	2/3/2021	99.259556	97.52204117	95.82281792	94.16076267	92.53479426	90.94387218	89.3869946	87.86319661	86.3715485
210616A00007	3/18/2022	0.9	3/18/2025	3/18/2022	100.00821	97.69978994	95.45563461	93.2736053	91.15165082	89.0877995	87.08015563	85.12689613	83.22626726
200302A00018	3/2/2020	1.25	3/2/2023	3/2/2020	100.23171	99.89491955	99.56038659	99.22808769	98.89800057	98.57010321	98.24437393	97.92079129	97.59933417
200316A00037	3/16/2020	1.06	3/14/2025	3/16/2020	100.69084	98.37805276	96.12944961	93.94290641	91.81637955	89.74790444	87.73559204	85.77762546	83.87225679
200611A00023	6/11/2020	0.64	6/12/2023	6/11/2020	99.835132	99.22287577	98.61810118	98.02067143	97.43045331	96.84731678	96.27113495	95.70178393	95.13914275
201001A00011	10/1/2020	0.71	6/17/2025	10/1/2020	99.559461	97.02156028	94.5603348	92.17300014	89.85689287	87.60946398	85.4282731	83.31098303	81.25535461
201030A00019	10/30/2020	1.15	10/29/2027	10/30/2020	102.53574	97.729447	93.17481997	88.85741914	84.7637097	80.88099657	77.19736802	73.70164337	70.38332451
220214A00012	2/14/2022	2.47	12/28/2029	2/14/2022	111.72569	104.6421426	98.06170102	91.9459168	86.25947807	80.96993415	76.04744936	71.46457935	67.19606766
210127A00008	1/27/2021	0.93	1/27/2027	1/27/2021	101.10489	97.03195436	93.14365284	89.43061354	85.88400019	82.49547376	79.25716134	76.16162713	73.20184541
211028A00020	10/28/2021	2.05	1/28/2031	10/28/2021	108.94588	100.9897983	93.67687644	86.95168622	80.76384944	75.0675555	69.82112482	64.98661623	60.52947363
200826A00038	8/28/2020	1.11	8/28/2024	8/28/2020	100.24808	98.46780037	96.72737816	95.02568394	93.36162725	91.73415548	90.14225235	88.58493637	87.06125941
210312A00008	3/12/2021	1.13	3/12/2026	3/12/2021	101.14316	97.88844464	94.75464666	91.73666863	88.82965367	86.0289736	83.33021695	80.72917769	78.22184456
210330A00022	3/30/2021	1.27	3/30/2026	3/30/2021	101.65776	98.34894318	95.16457779	92.09935242	89.14820782	86.30632612	83.56911806	80.93221087	78.3914369
210907A00009	9/7/2021	2.5	9/7/2039	9/7/2021	114.4453	99.40650315	86.61777127	75.72519985	66.43244116	58.4910815	51.69266862	45.86209855	40.85212453
210914A00017	9/14/2021	1.32	9/14/2028	9/14/2021	104.5193	98.81929865	93.46324569	88.42870017	83.69479589	79.24211971	75.05260356	71.10942491	67.39691507
220131A00006	1/31/2022	1.83	2/1/2027	1/31/2022	105.48697	101.2925666	97.28807022	93.4638355	89.81076407	86.32027048	82.98425004	79.79504881	76.74543573
220628A00052	8/15/2022	3.6	8/13/2027	8/15/2022	114.08862	109.2034985	104.5602851	100.1456735	95.94716674	91.95301873	88.15218488	84.53427638	81.08951768
220829A00048	8/29/2022	3.75	2/25/2025	8/29/2022	106.63348	104.3009455	102.0314567	99.82295689	97.673468	95.58108806	93.5439877	91.56040698	89.62865228

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220609A00038	10/3/2022	3.28	3/29/2024	10/3/2022	103.18768	101.7840895	100.4063863	99.05391463	97.72604164	96.4221553	95.14166335	93.88399264	92.64858828
200316A00055	3/16/2020	1.06	3/14/2025	3/16/2020	100.69084	98.37805276	96.12944961	93.94290641	91.81637955	89.74790444	87.73559204	85.77762546	83.87225679
220630A00019	6/30/2022	3.25	12/29/2023	6/30/2022	102.56176	101.4022407	100.26894	99.16097276	98.07749605	97.0177041	95.9808261	94.96612439	93.97289266
220719A00004	7/19/2022	3.46	7/19/2027	7/19/2022	113.22642	108.4279145	103.8643304	99.52284933	95.39142916	91.45874921	87.71416263	84.1476523	80.74978991
220906A00046	9/6/2022	3.79	9/7/2027	9/6/2022	115.20903	110.2300498	105.5004291	101.0063648	96.73488853	92.67381054	88.81166918	85.13768378	81.64171086
220908A00030	9/8/2022	3.85	9/9/2024	9/8/2022	105.38308	103.5219563	101.7029786	99.92494294	98.18669131	96.48710563	94.82510627	93.19965046	91.60973079
200423A00017	4/23/2020	1.82	4/23/2035	4/23/2020	108.11307	96.59774594	86.43270671	77.45188933	69.51043795	62.48190389	56.25582573	50.73563773	45.83686079
200429A00057	4/29/2020	1.4	4/29/2027	4/29/2020	103.34324	98.98233417	94.82946421	90.87364461	87.10452985	83.51237049	80.08797574	76.82267849	73.70830278
201118A00009	11/18/2020	0.61	11/18/2025	11/18/2020	99.690046	96.74681312	93.90473133	91.15976892	88.50807893	85.94598974	83.46999589	81.07674954	78.7630524
210216A00011	2/17/2021	0.83	12/15/2025	2/17/2021	100.00418	96.99590552	94.09263967	91.29012347	88.58429656	85.97128762	83.44740429	81.00912365	78.65308337
211119A00009	11/19/2021	1.68	11/19/2027	11/19/2021	105.22502	100.2977173	95.62985706	91.20644773	87.01344102	83.03766775	79.26677834	75.68918751	72.29402303
220325A00020	3/28/2022	2.86	3/23/2027	3/28/2022	109.66419	105.2596811	101.0590191	97.05171975	93.22789143	89.57819822	86.09382604	82.76645084	79.58820885
220624A00033	6/24/2022	3.5	6/24/2027	6/24/2022	113.25883	108.5247696	104.0196442	99.73111907	95.64759375	91.75815346	88.05252448	84.52103285	81.15456598
200401A00023	4/1/2020	0.82	4/1/2025	4/1/2020	100.12767	97.77572487	95.49030448	93.26916487	91.11014986	89.01118832	86.97029028	84.98554326	83.05510878
200413A00027	4/13/2020	0.94	4/12/2024	4/13/2020	99.863378	98.44737592	97.05820227	95.69516229	94.35758465	93.04482052	91.75624262	90.49124437	89.24923898
210224A00007	2/26/2021	0.68	10/21/2024	2/26/2021	99.467363	97.55411114	95.68689548	93.86432842	92.08507378	90.34784443	88.65140015	86.99454553	85.37612808
211214A00013	12/14/2021	1.02	12/14/2023	12/14/2021	99.946547	98.84273127	97.76313102	96.70695636	95.67345175	94.66189384	93.67158974	92.70187547	91.75211444
220329A00009	3/29/2022	2.94	3/29/2029	3/29/2022	114.00631	107.5476765	101.5037231	95.84560905	90.54664548	85.58212062	80.92914373	76.56650225	72.47453087
220419A00014	4/19/2022	3.06	4/18/2025	4/19/2022	105.35506	102.8997132	100.5145379	98.19712546	95.94516886	93.75645372	91.628854	89.56032794	87.54891411
220617A00040	6/17/2022	3.23	6/16/2023	6/17/2022	101.46274	100.8339443	100.2129431	99.59959459	98.99375783	98.3952952	97.80407248	97.21995867	96.64282595
210226A00002	2/26/2021	0.86	2/26/2025	2/26/2021	99.907279	97.65142272	95.45707812	93.32223515	91.24496116	89.22339752	87.25575632	85.34031729	83.4754248
210629A00015	6/29/2021	1.89	6/27/2031	6/29/2021	107.59329	99.32948962	91.76513757	84.83734165	78.48917357	72.669071	67.33030642	62.43051108	57.93124801
210719A00004	7/19/2021	1	4/20/2026	7/19/2021	100.78157	97.43336934	94.21330374	91.11580508	88.13557947	85.26759019	82.50704371	79.84937665	77.29024342
210907A00004	9/7/2021	2.01	9/7/2033	9/7/2021	108.52875	98.3854112	89.28927811	81.12642876	73.79587169	67.20801989	61.28335272	55.95124048	51.14891121
220216A00002	2/16/2022	2.09	2/14/2025	2/16/2022	102.71869	100.4640578	98.26988353	96.1341633	94.05497471	92.03047249	90.05888472	88.13850935	86.26771091
220418A00016	4/22/2022	3.11	9/15/2026	4/22/2022	109.25877	105.3688682	101.6403718	98.06574922	94.63786127	91.34993663	88.19555083	85.16860669	82.26331604
200311A00055	3/11/2020	1.66	12/17/2027	3/11/2020	105.1935	100.1951396	95.46326542	90.9822858	86.7376065	82.7155586	78.90333481	75.28893054	71.86108929
210623A00028	6/23/2021	1.22	6/23/2026	6/23/2021	101.72412	98.19411265	94.80443993	91.54875723	88.42104191	85.41557775	82.52693737	79.74996586	77.07976531
200818A00016	3/31/2021	0.57	4/1/2024	3/31/2021	99.335282	97.95244222	96.59527802	95.26313852	93.95539391	92.67143501	91.41067244	90.17253584	88.95647307
220511A00002	5/11/2022	3.18	5/12/2025	5/11/2022	105.81293	103.2879866	100.8367114	98.45652417	96.14494867	93.89961085	91.7182339	89.59863359	87.53871387
220817A00047	8/17/2022	3.29	8/17/2027	8/17/2022	113.34629	108.4463047	103.7902982	99.36480883	95.15719083	91.15555944	87.34874076	83.72622546	80.27812564
200305A00001	3/5/2020	1.14	3/5/2025	3/5/2020	100.56851	98.28640362	96.06694528	93.9080778	91.80782758	89.76429645	87.77565834	85.84015613	83.95609867
200323A00011	3/23/2020	1.37	3/23/2023	3/23/2020	100.28035	99.8860728	99.49489696	99.10678446	98.72169938	98.33960635	97.96047055	97.58425771	97.21093407

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210309A00002	3/11/2021	0.77	7/25/2024	3/11/2021	99.612185	97.92555128	96.27509706	94.65972315	93.07837539	91.53004223	90.0137525	88.5285734	87.07360849
220209A00010	2/9/2022	2.14	1/11/2027	2/9/2022	106.13555	101.9979075	98.04487367	94.26719708	90.65614655	87.20347621	83.90139556	80.74254153	77.71995239
220419A00013	4/19/2022	2.84	4/19/2024	4/19/2022	102.67019	101.2140197	99.78574495	98.38463851	97.00999338	95.66112664	94.33737839	93.03811078	91.76270708
201221A00015	12/21/2020	0.88	12/4/2026	12/21/2020	100.79931	96.86831521	93.11045517	89.51720311	86.0805003	82.79272659	79.64667404	76.63552223	73.75281521
211209A00006	12/9/2021	1.61	12/8/2026	12/9/2021	103.79209	99.79001502	95.96382732	92.30486716	88.80494715	85.45632603	82.2516818	79.18408651	76.24698288
220705A00005	7/5/2022	3.15	1/5/2024	7/5/2022	102.48662	101.308939	100.1583178	99.0338308	97.93459463	96.85976526	95.80853594	94.78013512	93.7738246
200402A00009	4/2/2020	1.03	4/2/2025	4/2/2020	100.32825	97.97769893	95.69357152	93.47362358	91.31570373	89.21774539	87.17776291	85.1938479	83.26416578
201001A00012	10/1/2020	0.74	9/16/2025	10/1/2020	99.662618	96.89029138	94.2083345	91.61333797	89.10203931	86.67131602	84.31817879	82.03976509	79.83333307
220218A00003	2/18/2022	2.16	9/4/2026	2/18/2022	105.52882	101.739976	98.1079984	94.62560068	91.28587575	88.08227013	85.00856404	82.05885272	79.22752891
220408A00012	4/8/2022	3.12	6/29/2026	4/8/2022	108.68151	105.0086789	101.4810215	98.0919784	94.835325	91.7051537	88.69585589	85.8021049	83.01883997
200316A00043	3/16/2020	1.3	3/14/2025	3/16/2020	100.95672	98.64702162	96.40128972	94.21740431	92.09333246	90.02711975	88.01688674	86.06082563	84.15719715
200402A00010	4/2/2020	0.89	4/2/2024	4/2/2020	99.792125	98.40322586	97.04015914	95.70226813	94.3889179	93.09949439	91.83340354	90.59007049	89.36893882
211115A00032	11/15/2021	1.75	11/12/2027	11/15/2021	105.55564	100.638472	95.97928848	91.56322669	87.37635995	83.4056303	79.63878969	76.06434563	72.67151072
220209A00012	2/9/2022	1.98	7/29/2025	2/9/2022	103.05243	100.3585339	97.74845672	95.21904318	92.76728265	90.39029966	88.08534668	85.84979731	83.68113998
220317A00011	3/17/2022	2.48	3/17/2025	3/17/2022	103.7718	101.4204334	99.13416413	96.91083798	94.74838201	92.64480358	90.59818677	88.6066889	86.66853733
200327A00058	3/27/2020	0.9	3/27/2023	3/27/2020	100.09018	99.68545905	99.28399847	98.88576334	98.49071493	98.09881513	97.71002642	97.32431189	96.94163521
220301A00015	3/1/2022	2	1/4/2027	3/1/2022	105.51723	101.4104208	97.48629571	93.73573156	90.15011678	86.72131652	83.44164335	80.30382987	77.30100328
221006A00012	10/6/2022	4.37	10/6/2027	10/6/2022	118.30015	113.1673728	108.2945172	103.6670053	99.27115601	95.09412121	91.12383078	87.34894163	83.75879022
200310A00054	3/10/2020	1.1	3/10/2025	3/10/2020	100.47862	98.18486743	95.95440697	93.78515756	91.675115	89.62235213	87.62501541	85.68132166	83.78955501
200611A00020	6/11/2020	0.81	6/11/2025	6/11/2020	99.818944	97.29339767	94.84376598	92.46730768	90.16139958	87.92353042	85.75129529	83.64239026	81.59460745
211221A00025	12/21/2021	1.59	12/21/2026	12/21/2021	103.75884	99.72421141	95.86814101	92.18177685	88.65675189	85.28515865	82.0595212	78.97276909	76.01821295
220309A00010	3/9/2022	2.27	3/8/2027	3/9/2022	106.96208	102.65613	98.54848939	94.62902439	90.88817214	87.31690311	83.90668866	80.64947076	77.53763376
220913A00017	9/13/2022	3.98	9/14/2026	9/13/2022	112.60911	108.65733	104.8686968	101.2356203	97.75090318	94.40771826	91.19958746	88.12036216	85.1642047
200330A00066	3/30/2020	1.08	3/31/2025	3/30/2020	100.44745	98.10068236	95.82007253	93.6033944	91.44850988	89.35336498	87.3159859	85.33447548	83.40700974
220823A00009	8/23/2022	3.52	8/23/2027	8/23/2022	113.78741	108.8827643	104.2223195	99.7926198	95.58101946	91.57563082	87.76527504	84.13943615	80.68821833
200312A00006	3/12/2020	1.23	3/12/2025	3/12/2020	100.78818	98.48561747	96.2466973	94.06932302	91.9514756	89.89121377	87.88667058	85.93605011	84.03762435
201116A00021	11/16/2020	0.53	11/15/2024	11/16/2020	99.423823	97.44073874	95.50669532	93.62016623	91.77968355	89.98383539	88.23126321	86.52065949	84.85076531
211220A00005	12/20/2021	0.97	12/20/2023	12/20/2021	99.891002	98.77171846	97.67733925	96.60704106	95.56003647	94.53557204	93.53292651	92.55140909	91.59035789
220420A00033	4/20/2022	3.29	4/20/2027	4/20/2022	111.72296	107.199999	102.8891778	98.77942264	94.86029431	91.12194978	87.55510499	84.15100017	80.90136757
200225A00040	10/30/2020	1.48	10/30/2023	10/30/2020	100.4057	99.41816357	98.44994376	97.50048235	96.56923871	95.65569281	94.75934421	93.87971121	93.01632992
210219A00008	2/22/2021	0.86	12/1/2025	2/22/2021	100.08146	97.10748925	94.23635104	91.46391279	88.78623681	86.19956654	83.70031695	81.28506564	78.95054437
220509A00014	7/15/2022	3.37	7/15/2027	7/15/2022	112.82275	108.0426964	103.4963601	99.17101335	95.05469313	91.13615166	87.4048095	83.85071177	80.46448775
220509A00016	7/15/2022	3.37	7/15/2027	7/15/2022	112.82275	108.0426964	103.4963601	99.17101335	95.05469313	91.13615166	87.4048095	83.85071177	80.46448775

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200327A00060	3/27/2020	1.18	3/27/2025	3/27/2020	100.68533	98.34581594	96.07197193	93.86159657	91.71257592	89.62287878	87.59055301	85.61372189	83.69058079
200320A00052	3/25/2020	1.47	3/25/2025	3/25/2020	101.3804	99.03749603	96.76017426	94.54623717	92.39357844	90.30017405	88.26407852	86.28342145	84.35640408
220929A00034	9/29/2022	4.67	5/31/2024	9/29/2022	105.79859	104.2056609	102.6446887	101.1147735	99.61505315	98.14469724	96.70290539	95.28890605	93.90195515
200304A00005	3/4/2020	0.98	3/4/2025	3/4/2020	100.49225	98.20741555	95.98535612	93.82401342	91.72140835	89.67563755	87.68487	85.74734391	83.86136363
200327A00046	3/27/2020	1.23	3/27/2025	3/27/2020	100.8058	98.464813	96.18952895	93.97774438	91.82734443	89.73629704	87.70264919	85.72452336	83.80011415
210707A00002	7/7/2021	1.12	6/26/2026	7/7/2021	101.36883	97.83741248	94.44671749	91.19036488	88.06230338	85.0567903	82.16837382	79.39187637	76.72237915
210712A00010	6/27/2022	1.05	6/27/2025	6/27/2022	100.46705	97.89065626	95.3926311	92.97010088	90.62032195	88.34066976	86.12863279	83.98180678	81.89788931
221020A00052	10/20/2022	4.95	10/21/2024	10/20/2022	107.93126	105.9321691	103.9807708	102.0756335	100.2153761	98.39866791	96.62422695	94.89081754	93.19724834
210701A00007	7/1/2021	1.22	7/1/2026	7/1/2021	101.74807	98.19671304	94.78722676	91.51316567	88.36841212	85.34716151	82.44390427	79.6534089	76.97070623
211210A00015	12/10/2021	1.63	12/10/2026	12/10/2021	103.88157	99.87255229	96.0398936	92.37490168	88.86935928	85.51549748	82.30596857	79.23382077	76.29247461
220111A00002	1/11/2022	1.75	1/16/2026	1/11/2022	102.99227	99.85496552	96.82915271	93.9102127	91.09374555	88.37556177	85.75167064	83.21826935	80.7717328
220209A00004	2/9/2022	1.21	2/9/2023	2/9/2022	100.20425	99.92516453	99.64763521	99.37165154	99.09720058	98.82426957	98.55284585	98.28291694	98.01447048
200402A00003	4/2/2020	0.8	4/3/2023	4/2/2020	100.04039	99.61673329	99.19665	98.78009769	98.36703202	97.95740937	97.55118687	97.14832234	96.74877431
200527A00016	5/27/2020	0.92	5/27/2025	5/27/2020	100.09424	97.60430197	95.18832105	92.8436586	90.56779183	88.35830382	86.2128783	84.12929476	82.1054238
220204A00003	2/4/2022	1.15	2/3/2023	2/4/2022	100.1861	99.92351838	99.66231022	99.40246531	99.14397302	98.88682282	98.63100431	98.37650718	98.12332122
220624A00044	6/24/2022	3.43	6/24/2025	6/24/2022	106.77258	104.1196443	101.5465901	99.05051065	96.62862551	94.27827455	91.99691153	89.78209839	87.63149986
221020A00046	10/20/2022	4.95	1/21/2025	10/20/2022	109.00324	106.7434396	104.5423092	102.3978971	100.308331	98.27181604	96.2866317	94.35112744	92.4637194
200401A00013	4/1/2020	1.01	4/1/2025	4/1/2020	100.27888	97.93156288	95.6505026	93.43346971	91.27832033	89.18299498	87.14551472	85.16397753	83.23655484
200826A00039	8/28/2020	1.03	7/29/2024	8/28/2020	100.06921	98.36815503	96.70374607	95.07486579	93.48044118	91.91944286	90.39088278	88.89381214	87.42731937
210208A00008	2/11/2021	0.78	11/17/2025	2/11/2021	99.819002	96.88569912	94.05292398	91.31667994	88.67315306	86.11870273	83.64985268	81.26328253	78.95581982
210706A00015	7/6/2021	1.06	12/31/2025	7/6/2021	100.74969	97.68902673	94.73623759	91.88690034	89.13680044	86.48192219	83.91843797	81.44269806	79.05122117
200305A00019	3/5/2020	0.81	3/6/2023	3/5/2020	100.10934	99.76153326	99.41614026	99.07313957	98.73250633	98.39421603	98.05824452	97.72456793	97.39316278
200403A00010	4/6/2020	0.8	4/6/2023	4/6/2020	100.03617	99.60437164	99.17628984	98.75187948	98.33109344	97.91388543	97.50020994	97.09002221	96.68327827
220302A00011	3/2/2022	2.14	1/13/2027	3/2/2022	106.14571	102.0027093	98.04475945	94.26257425	90.64739245	87.19094044	83.8854021	80.72339061	77.69792231
200220A00034	2/25/2020	1.71	3/27/2023	2/25/2020	100.42055	100.0150155	99.61274871	99.2137121	98.81786691	98.42517498	98.03559875	97.64910127	97.26564614
200302A00017	3/2/2020	1.3	3/4/2024	3/2/2020	100.36738	99.04925317	97.75443577	96.48236782	95.23250218	94.00430878	92.797274	91.61089999	90.44470412
200330A00054	3/30/2021	1.19	3/30/2026	3/30/2021	101.38526	98.08109471	94.90125192	91.84042558	88.89356082	86.05584396	83.32268973	80.68972921	78.15279841
200331A00017	3/31/2020	0.9	3/31/2025	3/31/2020	100.32091	97.96922253	95.68396079	93.46288999	91.30385956	89.20480372	87.16373751	85.17875317	83.24801666
200325A00047	3/25/2020	1.68	9/25/2024	3/25/2020	101.37934	99.51397753	97.69190854	95.91187242	94.17265482	92.47308429	90.81203051	89.18840253	87.60114719
200415A00024	4/15/2020	2.2	4/16/2035	4/15/2020	110.96322	99.40246909	89.18403064	80.14389102	72.1388765	65.04391262	58.74965527	53.16044205	48.1925191
220404A00010	4/4/2022	2.93	4/2/2027	4/4/2022	110.04015	105.6012919	101.3689331	97.33239663	93.48161108	89.80707431	86.29981825	82.95137612	79.75375191
220627A00055	6/27/2022	3.55	6/26/2026	6/27/2022	110.22395	106.5311561	102.983763	99.57522207	96.29931581	93.15014253	90.12209845	87.20986069	84.4083714
210308A00009	3/8/2021	0.62	3/8/2024	3/8/2021	99.442306	98.1204292	96.82210364	95.54675492	94.29382702	93.06278135	91.85309613	90.66426574	89.49580006

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220628A00053	8/15/2022	3.6	8/13/2027	8/15/2022	114.08862	109.2034985	104.5602851	100.1456735	95.94716674	91.95301873	88.15218488	84.53427638	81.08951768
200417A00012	4/22/2020	0.71	12/15/2022	4/22/2020	100.07187	99.94728598	99.82302768	99.69909316	99.57548111	99.45219026	99.32921931	99.206567	99.08423206
210104A00011	11/23/2021	0.88	11/23/2026	11/23/2021	100.77672	96.8744887	93.14312015	89.57425451	86.15998249	82.89282244	79.76569477	76.77189809	73.90508692
210122A00006	1/25/2021	0.61	8/15/2024	1/25/2021	99.331536	97.5933551	95.89347794	94.23078072	92.60418198	91.01264087	89.45515527	87.93075996	86.43852496
210303A00006	3/4/2021	0.97	10/10/2025	3/4/2021	100.35017	97.50622283	94.75686199	92.09843965	89.52747264	87.04063062	84.63472849	82.30671921	80.053687
210916A00009	9/16/2021	2.25	9/16/2036	9/16/2021	111.83708	99.12877984	88.03817471	78.34885463	69.87443741	62.45426601	55.94974332	50.24120456	45.22524625
220124A00008	1/24/2022	1.88	1/22/2027	1/24/2022	105.09649	100.952367	96.99452362	93.21356651	89.60062764	86.1473356	82.84578464	79.68850583	76.66844022
200311A00052	3/2/2021	1.43	2/28/2025	3/2/2021	101.2413	98.9639582	96.74875674	94.59367057	92.49675221	90.45612823	88.46999596	86.5366204	84.65433135
220817A00037	10/14/2022	3.41	10/15/2027	10/14/2022	113.65707	108.6136247	103.8283207	99.28656913	94.97468278	90.87981341	86.98989604	83.2935972	79.78026693
200207A00013	2/12/2020	1.73	2/10/2023	2/12/2020	100.35468	100.0725316	99.79197987	99.51300639	99.23559783	98.95974099	98.68542284	98.41263049	98.14135118
200306A00064	3/6/2020	1.2	3/8/2027	3/6/2020	102.32711	98.1210804	94.11002706	90.28395926	86.63344609	83.14958352	79.82396233	76.64863821	73.61610379
200421A00032	4/21/2020	1.31	4/21/2027	4/21/2020	102.91917	98.58835442	94.46329673	90.53318117	86.78781818	83.2176025	79.81347664	76.56689681	73.46980115
200629A00023	6/29/2020	0.95	6/29/2026	6/29/2020	100.75626	97.22816411	93.84103863	90.588476	87.46440109	84.46304937	81.57894894	78.80690384	76.14197835
210928A00009	9/28/2021	2.18	9/28/2033	9/28/2021	110.32249	100.0394272	90.82022991	82.5487771	75.12217492	68.44919354	62.44889287	57.04941613	52.18693009
220629A00002	6/29/2022	3.48	6/28/2024	6/29/2022	104.14197	102.4857919	100.8639058	99.275312	97.71904791	96.19418792	94.6998418	93.23515291	91.79929665
220727A00004	7/27/2022	3.23	7/27/2027	7/27/2022	112.20607	107.4103201	102.8506074	98.51399074	94.38831781	90.46216775	86.72480269	83.16612287	79.77662488
201204A00015	12/8/2020	1.07	12/8/2025	12/8/2020	100.74135	97.73933046	94.84150343	92.04366916	89.34181984	86.73213305	84.21096197	81.77482613	79.42040274
200327A00088	3/27/2020	1.22	3/27/2025	3/27/2020	100.7817	98.44101359	96.16601755	93.95451482	91.80439073	89.71361339	87.68022995	85.70236307	83.77820748
210525A00004	5/25/2021	1.02	12/19/2025	5/25/2021	100.60383	97.5759763	94.65401267	91.8336328	89.11073264	86.48139983	83.94190342	81.48868423	79.11834577
210907A00011	9/7/2021	2.65	9/6/2041	9/7/2021	115.84976	99.38510137	85.61839977	74.08427547	64.40026123	56.25164891	49.37916601	43.56894522	38.64435147
211019A00009	10/19/2021	1.48	10/9/2026	10/19/2021	103.04632	99.21435639	95.5452723	92.03132216	88.66516538	85.4398465	82.34877297	79.38569432	76.54468259
220729A00043	7/29/2022	3.04	7/29/2027	7/29/2022	111.32438	106.5440452	101.9994909	97.67777828	93.56674951	89.65497952	85.93172752	82.38689191	79.01096836
220915A00040	9/15/2022	4.16	9/15/2025	9/15/2022	109.49785	106.5855915	103.7670047	101.0385778	98.39694884	95.83889978	93.36134935	90.96134659	88.63606453
200331A00015	3/31/2020	0.64	3/31/2023	3/31/2020	100.01484	99.59896465	99.18653535	98.77750609	98.37183503	97.96948104	97.57040363	97.17456298	96.78191991
210119A00005	1/20/2021	0.52	9/25/2023	1/20/2021	99.514263	98.62376132	97.74908334	96.88981065	96.04553948	95.21588007	94.40045602	93.59890379	92.8108721
200304A00030	3/4/2020	1.6	12/22/2028	3/4/2020	105.42523	99.48066925	93.9078655	88.68167243	83.7787683	79.17751789	74.85784194	70.80109731	66.989967
200629A00021	6/29/2020	1.21	6/29/2028	6/29/2020	103.04878	97.61153704	92.49173064	87.66921719	83.12523731	78.84231139	74.80414554	70.99554491	67.40233385
200324A00051	3/24/2020	1.73	11/1/2024	3/24/2020	101.57932	99.61626782	97.70099546	95.83204312	94.00800574	92.22753065	90.48931523	88.79210464	87.13468975
210914A00014	9/14/2021	0.97	9/14/2026	9/14/2021	101.48751	97.73636196	94.14275763	90.69930459	87.39899252	84.23517356	81.20154177	78.29211376	75.50121058
220331A00011	3/31/2022	2.73	10/15/2024	3/31/2022	103.49799	101.5594341	99.66697599	97.81923507	96.01488509	94.25264808	92.53129224	90.84962993	89.20651582
220712A00016	7/15/2022	3.35	1/15/2026	7/15/2022	108.11844	104.901179	101.7974162	98.80246462	95.91186258	93.12136097	90.42691179	87.82465706	85.31091861
200225A00028	2/25/2020	1.89	12/21/2029	2/25/2020	107.62235	100.698627	94.26843422	88.29402956	82.74074316	77.57671325	72.77264495	68.30159091	64.1387518
200310A00034	3/10/2020	1.41	3/11/2030	3/10/2020	104.19682	97.19425404	90.70739818	84.69574001	79.1221347	73.95251273	69.15561132	64.70273052	60.56751163

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
201214A00002	12/14/2020	0.45	12/14/2022	12/14/2020	100.0395	99.91771781	99.79624485	99.67508198	99.554228	99.43368168	99.31344183	99.19350724	99.07387672
211019A00011	10/19/2021	1.48	10/16/2026	10/19/2021	103.06934	99.21926048	95.53356986	92.00441215	88.62434652	85.38632448	82.28366708	79.31004353	76.45945129
200316A00046	3/16/2020	1.18	3/18/2024	3/16/2020	100.20552	98.85238714	97.5237781	96.21908519	94.93771969	93.67911173	92.44270953	91.22797872	90.03440163
200611A00019	6/11/2020	0.88	12/11/2025	6/11/2020	100.15539	97.15489606	94.25883381	91.4629837	88.76331895	86.15599961	83.6373626	81.2039124	78.85231227
210310A00003	3/15/2021	0.79	8/26/2024	3/15/2021	99.660053	97.89046876	96.16042386	94.46879106	92.81448348	91.19645249	89.61368605	88.06520716	86.55007244
220225A00014	2/25/2022	2.42	2/23/2029	2/25/2022	110.61454	104.3485697	98.48144178	92.98569611	87.83589948	83.00848418	78.48160224	74.23499172	70.24985406
220901A00035	9/1/2022	3.82	9/1/2028	9/1/2022	118.16815	112.1406029	106.4669668	101.1245516	96.09223389	91.35034177	86.88054805	82.66577196	78.69008847
200324A00013	3/25/2020	1.78	3/25/2025	3/25/2020	102.12562	99.77363256	97.48742124	95.26478466	93.10361086	91.00187038	88.95761254	86.96896187	85.0341148
201014A00002	10/14/2020	0.61	10/15/2024	10/14/2020	99.330433	97.43382059	95.58249447	93.77510093	92.01033563	90.28694168	88.60370759	86.95946532	85.35308837
220314A00004	3/14/2022	2.44	3/12/2027	3/14/2022	107.72091	103.3883067	99.25547821	95.31220282	91.54883122	87.95625327	84.52586518	81.24953887	78.11959333
200415A00033	4/15/2020	0.82	10/13/2023	4/15/2020	99.758742	98.81956746	97.89796612	96.99344836	96.1055428	95.23379528	94.37776807	93.53703912	92.71120135
220912A00033	9/12/2022	3.9	10/7/2024	9/12/2022	105.72871	103.7887384	101.894317	100.0441002	98.23679151	96.47114115	94.74594393	93.06003742	91.41230012
200422A00015	4/27/2020	0.73	12/22/2022	4/27/2020	100.08033	99.93638336	99.79286144	99.6497629	99.50708587	99.36482846	99.22298882	99.0815651	98.94055545
201105A00003	11/6/2020	2.24	11/4/2030	11/6/2020	110.43467	102.6254357	95.43084245	88.79922146	82.68350063	77.04077184	71.83190305	67.02118838	62.57603218
210907A00013	9/9/2021	2.14	9/9/2025	9/9/2021	103.66251	100.8507212	98.12955813	95.49562552	92.94567779	90.47660754	88.08543897	85.76932156	83.5255241
200317A00023	3/17/2020	1.1	3/17/2025	3/17/2020	100.78945	98.46779165	96.21075914	94.01620197	91.88205662	89.80633967	87.7871442	85.82263636	83.91105215
201015A00002	10/15/2020	0.61	10/15/2024	10/15/2020	99.330433	97.43382059	95.58249447	93.77510093	92.01033563	90.28694168	88.60370759	86.95946532	85.35308837
210920A00014	9/9/2022	1.28	9/9/2026	9/9/2022	102.17108	98.4334953	94.85188973	91.41898091	88.12786483	84.97199252	81.94515	79.04143946	76.25526156
220114A00007	1/14/2022	1.7	1/27/2026	1/14/2022	102.87046	99.70698037	96.6568128	93.71521808	90.87768976	88.139939	85.49788238	82.94763049	80.48547736
220119A00009	1/19/2022	1.35	1/19/2024	1/19/2022	100.35872	99.15763427	97.98511557	96.84015606	95.72179347	94.62910983	93.561229	92.51731429	91.49656624
220804A00023	8/4/2022	3.19	8/4/2027	8/4/2022	112.07452	107.2607844	102.6849608	98.33397518	94.19554406	90.25812433	86.51086412	82.94355738	79.54660166
200730A00011	7/30/2020	1.15	7/28/2028	7/30/2020	102.71161	97.21254724	92.03856829	87.16879119	82.58378591	78.26546517	74.19698428	70.36264903	66.74783093
210928A00010	9/28/2021	1.12	9/26/2025	9/28/2021	100.77208	97.95754595	95.23542626	92.60220638	90.05452417	87.58916303	85.2030448	82.89322296	80.6568763
200228A00071	2/28/2020	1.74	12/14/2029	2/28/2020	106.56312	99.69315623	93.31253999	87.38389903	81.87290075	76.74798852	71.98014365	67.54266898	63.41099193
200304A00020	3/4/2020	0.98	3/4/2025	3/4/2020	100.49225	98.20741555	95.98535612	93.82401342	91.72140835	89.67563755	87.68487	85.74734391	83.86136363
200325A00043	3/25/2020	1.62	6/25/2024	3/25/2020	101.02973	99.40844205	97.8206924	96.26550183	94.74193194	93.24908039	91.78607912	90.35209272	88.94631686
200409A00011	4/9/2020	0.7	4/7/2023	4/9/2020	100.02992	99.59496031	99.16378143	98.73633042	98.31255903	97.89241982	97.47586619	97.06285232	96.65333319
210108A00008	1/11/2021	0.51	8/15/2023	1/11/2021	99.602086	98.81975241	98.04963978	97.29146333	96.54494727	95.80982429	95.08583517	94.37272852	93.67026046
210917A00004	9/17/2021	1.03	9/17/2025	9/17/2021	100.49874	97.71167977	95.01544586	92.40661329	89.88190169	87.43817156	85.07241738	82.78176121	80.56344652
220921A00050	9/21/2022	4.51	4/29/2024	9/21/2022	105.23476	103.7316404	102.2577833	100.8124113	99.39477049	98.00413292	96.63979578	95.30108012	93.98732987
200323A00018	3/23/2020	1.37	3/23/2023	3/23/2020	100.28035	99.8860728	99.49489696	99.10678446	98.72169938	98.33960635	97.96047055	97.58425771	97.21093407
200401A00012	4/2/2020	1	4/2/2025	4/2/2020	100.25548	97.90582351	95.62257145	93.40348002	91.24639841	89.14926056	87.11008136	85.12695293	83.19804113
200423A00026	4/28/2020	0.85	12/15/2023	4/28/2020	99.754338	98.6490438	97.56806226	96.51059888	95.47589327	94.46321748	93.47187429	92.50119566	91.55054116

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210324A00003	3/24/2021	1.18	3/24/2026	3/24/2021	101.33782	98.04957333	94.88452917	91.83744641	88.90333616	86.07744655	83.35525021	80.73243242	78.20488005
210526A00018	5/26/2021	1.11	5/26/2026	5/26/2021	101.24908	97.80072921	94.48725163	91.30265071	88.24123218	85.29758563	82.46656872	79.74329223	77.12310613
220824A00008	8/24/2022	3.62	8/24/2023	8/24/2022	102.13042	101.3129083	100.5084973	99.71687029	98.9377241	98.17076494	97.41570822	96.67227817	95.94020746
200221A00011	2/21/2020	1.69	8/21/2024	2/21/2020	101.29224	99.52031374	97.78766694	96.09316962	94.43572925	92.81429296	91.22784569	89.67540859	88.1560374
200221A00024	2/21/2020	2.05	12/28/2029	2/21/2020	108.75776	101.7774509	95.29501692	89.27233026	83.6743738	78.46897153	73.62654394	69.11988572	64.92396358
200306A00003	3/6/2020	0.7	3/6/2023	3/6/2020	100.07087	99.72314291	99.3778331	99.03491517	98.69436427	98.35615589	98.02026587	97.68667037	97.35534588
200309A00030	3/9/2020	1.11	3/9/2027	3/9/2020	101.93928	97.73910643	93.73386263	89.91354675	86.26872296	82.79048298	79.47041393	76.30056837	73.27343629
200415A00021	4/15/2020	1.37	4/15/2027	4/15/2020	103.21347	98.89033349	94.77181172	90.84718944	87.10636844	83.53982741	80.13858602	76.89417139	73.79858688
200521A00017	5/21/2020	2.22	5/21/2038	5/21/2020	111.15542	97.26432453	85.32515481	75.05008869	66.19521756	58.55364636	51.94971009	46.23411838	41.27987542
210218A00006	2/18/2021	0.5	2/20/2024	2/18/2021	99.304153	98.02686692	96.7746154	95.54667895	94.34236559	93.16100981	92.00197121	90.86463339	89.74840276
201117A00006	11/17/2020	0.57	11/17/2023	11/17/2020	99.46745	98.43753989	97.42879247	96.44056102	95.4722252	94.52318945	93.59288176	92.68075251	91.78627342
210712A00008	6/27/2022	1.05	6/27/2025	6/27/2022	100.46705	97.89065626	95.3926311	92.97010088	90.62032195	88.34066976	86.12863279	83.98180678	81.89788931
211129A00012	11/29/2021	1.53	11/25/2026	11/29/2021	103.41663	99.4558172	95.6679692	92.04462345	88.57777977	85.25987057	82.083735	79.04259474	76.13003147
220106A00008	1/6/2022	2.5	1/5/2035	1/6/2022	114.37616	102.8402647	92.61066925	83.53125094	75.46533458	68.29317652	61.909789	56.22305374	51.15208502
220323A00016	6/2/2022	2.78	6/2/2025	6/2/2022	104.91822	102.3495799	99.85711911	97.43811668	95.08996761	92.81017679	90.59635354	88.44620649	86.35753871
200327A00059	3/27/2020	1.01	3/27/2024	3/27/2020	99.965276	98.59070302	97.24142815	95.91681451	94.61624634	93.33912786	92.08488254	90.85295227	89.64279666
201116A00025	11/18/2020	1.96	11/15/2032	11/18/2020	107.98932	98.53906327	90.00075042	82.2814258	75.29804937	68.97639589	63.25007929	58.05968937	53.35202731
211221A00010	12/21/2021	1.31	12/20/2024	12/21/2021	100.82638	98.741823	96.71024286	94.72992981	92.79924198	90.9166031	89.08049932	87.28947619	85.54213581
220510A00016	5/13/2022	3.23	5/5/2027	5/13/2022	111.57339	107.0135694	102.6694241	98.52960181	94.58340563	90.82075504	87.23214693	83.80861949	80.5417185
220527A00015	5/27/2022	3.03	5/27/2027	5/27/2022	110.83358	106.2323202	101.8511824	97.67845383	93.70310762	89.91475937	86.30362619	82.86048857	79.57665488
221024A00018	10/24/2022	4.91	10/24/2024	10/24/2022	107.88622	105.8796272	103.9210942	102.0091697	100.1424568	98.31961009	96.53933321	94.800377	93.10153729
200310A00005	3/10/2020	1.41	3/8/2030	3/10/2020	104.2001	97.20448111	90.72354531	84.71689753	79.14750073	73.98138117	69.18736125	64.73681672	60.60345613
200327A00037	3/27/2020	1.18	3/27/2026	3/27/2020	101.78278	98.46823755	95.27832807	92.20773108	89.25138212	86.40445825	83.6623653	81.02072571	78.47536719
200406A00049	4/6/2020	0.92	4/6/2023	4/6/2020	100.08844	99.65650051	99.22828392	98.80373961	98.38282046	97.96548017	97.5516732	97.14135482	96.73448102
200429A00021	5/4/2020	0.97	4/29/2025	5/4/2020	100.20273	97.78308281	95.43383653	93.15254144	90.93685055	88.78451244	86.69336675	84.66133988	82.68644097
201019A00006	10/19/2020	0.57	10/19/2023	10/19/2020	99.518257	98.56436289	97.62862541	96.71053032	95.80958272	94.92530604	94.05724124	93.20494599	92.36799393
210225A00012	3/1/2021	0.91	8/25/2025	3/1/2021	100.13218	97.40999599	94.77480218	92.22335572	89.75255288	87.35942271	85.04112059	82.79492201	80.61821686
220204A00004	2/4/2022	2.08	1/8/2027	2/4/2022	105.8699	101.7455055	97.80488518	94.03885045	90.43872151	86.99630024	83.70384043	80.55402012	77.53991578
220823A00032	8/23/2022	3.6	8/23/2023	8/23/2022	102.1077	101.2929838	100.4912774	99.70227222	98.92566779	98.16117315	97.40850636	96.66739418	95.93757173
220921A00074	9/21/2022	3.98	9/21/2027	9/21/2022	116.98358	111.9008479	107.0745849	102.4904816	98.13509818	93.99580878	90.06074799	86.31876134	82.75935917
211117A00010	11/17/2021	1.18	11/18/2024	11/17/2021	100.50146	98.50406764	96.55605307	94.65587379	92.80205	90.99315848	89.22782996	87.50474663	85.82263984
201105A00002	11/5/2020	0.49	11/7/2022	11/5/2020	100.01178	99.99237525	99.97298708	99.95361839	99.93426916	99.91493934	99.89562891	99.87633784	99.85706609
200605A00014	6/5/2020	1.02	6/5/2025	6/5/2020	100.33857	97.92070432	95.57434788	93.29694114	91.08603812	88.93929621	86.85447109	84.82941181	82.86205629

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200605A00016	6/5/2020	1.02	6/5/2025	6/5/2020	100.33857	97.92070431	95.57434787	93.29694113	91.08603811	88.9392962	86.85447107	84.82941179	82.86205628
200605A00017	6/5/2020	1.02	6/5/2025	6/5/2020	100.33857	97.92070433	95.57434791	93.29694119	91.08603818	88.9392963	86.85447119	84.82941192	82.86205642
200709A00021	7/9/2020	0.83	7/9/2025	7/9/2020	99.882563	97.39162676	94.97636753	92.6339983	90.36185535	88.1573918	86.0181715	83.94186335	81.92623594
200709A00025	7/9/2020	1.37	7/9/2030	7/9/2020	103.43388	96.99188348	91.02249606	85.48800623	80.3539178	75.58865981	71.16332327	67.0514229	63.22868149
200813A00019	8/13/2020	1.44	8/13/2030	8/13/2020	103.87265	97.34249846	91.29627389	85.69499741	80.50304244	75.68782819	71.21954373	67.07089843	63.21689617
200813A00020	8/13/2020	1.44	8/13/2030	8/13/2020	103.87265	97.34249846	91.29627397	85.69499756	80.50304265	75.68782846	71.21954405	67.0708988	63.21689659
200813A00023	8/13/2020	0.86	10/14/2025	8/13/2020	100.01534	97.29604231	94.66632335	92.12273776	89.66199363	87.28094368	84.97657805	82.74601745	80.58650676
200911A00011	9/11/2020	1.18	9/11/2030	9/11/2020	102.06353	95.56968792	89.56200873	84.00101058	78.85062219	74.07787509	69.65262167	65.54728013	61.7366037
200911A00012	9/11/2020	1.18	9/11/2030	9/11/2020	102.06333	95.57053536	89.5638039	84.00365633	78.85403034	74.08196558	69.6573218	65.5525239	61.74233118
200911A00013	9/11/2020	0.69	9/11/2025	9/11/2020	99.527317	96.89416167	94.34537166	91.87779408	89.48841166	87.17433571	84.93279996	82.76115464	80.65686096
201007A00008	10/7/2020	1.22	10/7/2030	10/7/2020	102.25677	95.92901359	90.07194868	84.64734424	79.62028241	74.95885786	70.63390274	66.618738	62.88894857
201007A00010	10/7/2020	1.22	10/7/2030	10/7/2020	102.25677	95.92901359	90.07194868	84.64734424	79.62028241	74.95885786	70.63390274	66.618738	62.88894857
201007A00014	10/7/2020	0.8	10/7/2025	10/7/2020	99.841936	97.17240122	94.59000083	92.09140978	89.6734491	87.3330785	85.06738947	82.87359878	80.74904238
201015A00020	10/15/2020	0.94	10/15/2027	10/15/2020	101.31032	96.92780652	92.76765553	88.81735372	85.06516115	81.50005559	78.11168491	74.89032292	71.82682833
201109A00012	11/9/2020	1.39	11/8/2030	11/9/2020	103.43401	96.76080692	90.59541778	84.89589429	79.62397729	74.74475613	70.2263589	66.03967277	62.15809139
201211A00001	12/11/2020	0.95	12/11/2030	12/11/2020	101.2732	95.21745071	89.61046224	84.41554958	79.59924648	75.13100613	70.9829306	67.1295269	63.54748665
210107A00007	1/7/2021	0.84	1/7/2026	1/7/2021	100.042	97.12373844	94.30744779	91.58894629	88.96425559	86.42958549	83.98132365	81.61602604	79.33040782
210201A00002	2/1/2021	1.19	2/1/2036	2/1/2021	101.02921	94.72992217	88.97974964	83.7231656	78.91080778	74.49874847	70.44785235	66.72321464	63.29366908
210809A00010	8/9/2021	1.06	8/7/2026	8/9/2021	101.1208	97.73367271	94.48212271	91.35992624	88.3611867	85.48031243	82.71199891	80.05121216	77.49317318
210915A00027	9/15/2021	1.1	9/15/2026	9/15/2021	101.34525	97.86616561	94.52974923	91.32938091	88.25878474	85.31200707	82.48339829	79.76759571	77.15950749
210921A00006	9/21/2021	1.43	9/21/2028	9/21/2021	103.94971	98.73724811	93.83063784	89.21019432	84.85760233	80.75581222	76.88894626	73.24221234	69.80182444
210921A00009	9/21/2021	1.28	9/21/2028	9/21/2021	103.89124	98.66293878	93.74209565	89.10888667	84.74486756	80.6328709	76.75691143	73.10209885	69.65455745
211007A00006	10/7/2021	1.28	10/7/2026	10/7/2021	102.053	98.5057381	95.10590567	91.84656468	88.72114481	85.72341805	82.84747899	80.0877264	77.43884593
211014A00012	10/14/2021	1.46	10/14/2031	10/14/2021	103.58405	99.09285216	94.87966174	90.92419188	87.20780599	83.71337287	80.42513434	77.32858531	74.41036518
211110A00012	11/10/2021	1.44	11/10/2026	11/10/2021	102.73971	99.09895442	95.61250557	92.27295714	89.07329858	86.00689269	83.0674536	80.24902623	77.545967
211110A00013	11/10/2021	1.44	11/10/2026	11/10/2021	102.73971	99.09895441	95.61250535	92.27295673	89.07329799	86.00689192	83.06745268	80.24902515	77.54596578
211110A00014	11/10/2021	1.44	11/10/2026	11/10/2021	102.73971	99.09895446	95.61250606	92.27295806	89.07329991	86.0068944	83.06745567	80.24902864	77.54596973
211208A00012	12/8/2021	1.62	12/8/2026	12/8/2021	103.51765	99.79208	96.22662996	92.81350005	89.5453164	86.41510434	83.41626434	80.54254967	77.78804545
220111A00005	1/11/2022	1.54	1/10/2025	1/11/2022	101.31148	99.24414541	97.22988826	95.26696491	93.35370079	91.48849006	89.66979205	87.89612807	86.16607836
220411A00008	4/11/2022	3.02	4/12/2027	4/11/2022	110.36057	106.1401306	102.1134312	98.2704794	94.60185395	91.09866696	87.75253089	84.55552774	81.50018026
220520A00006	5/20/2022	3.02	5/20/2027	5/20/2022	110.33063	106.123775	102.1121359	98.28548976	94.63420904	91.14922138	87.82197426	84.64440234	81.60889697
220617A00030	6/17/2022	3.43	6/17/2025	6/17/2022	103.47059	102.0778958	100.7173568	99.38796195	98.08874409	96.8187738	95.57715782	94.36303736	93.17558641
220617A00061	6/17/2022	3.26	6/17/2024	6/17/2022	102.00039	101.1217279	100.2588209	99.41123206	98.5785443	97.76035586	96.95627985	96.16594348	95.38898741

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220916A00018	9/16/2022	4.07	9/16/2027	9/16/2022	114.47009	110.0719564	105.88535	101.8987809	98.10144596	94.48318484	91.03443812	87.74620874	84.61002593
220919A00036	9/19/2022	4.11	9/19/2029	9/19/2022	121.235	114.5032915	108.2173396	102.3448211	96.85593039	91.72316873	86.92115456	82.42644992	78.21740206
221017A00055	10/17/2022	4.88	11/18/2024	10/17/2022	104.30545	103.1958206	102.1082341	101.0420638	99.99670323	98.97156835	97.96609686	96.97974694	96.01199644
210603A00008	6/3/2021	1.74	6/3/2036	6/3/2021	105.59837	99.07174508	93.11786906	87.67810406	82.7004269	78.13862503	73.95159909	70.10275414	66.55946777
220722A00036	7/22/2022	3.34	7/22/2025	7/22/2022	103.40276	101.9891901	100.6087765	99.26046737	97.94325166	96.65615851	95.39825526	94.16864568	92.9664682
220916A00021	9/16/2022	4.17	9/16/2027	9/16/2022	108.41976	105.8731056	103.4188926	101.0529545	98.77134648	96.57032973	94.44635872	92.39607007	90.41627193
170130A00010	1/30/2017	2.92	1/30/2025	1/30/2017	104.5241	102.2916405	100.1179207	98.00096097	95.93886558	93.92981859	91.97207985	90.06398108	88.20392218
170203A00013	2/3/2017	3.67	2/1/2036	2/3/2017	129.56651	116.2361622	104.4971024	94.14727271	85.01139938	76.93731319	69.79279062	63.46284131	57.84737687
190328A00033	4/25/2019	2.56	4/25/2024	4/25/2019	102.28294	100.8136334	99.37278201	97.95963357	96.57345992	95.21355788	93.8792482	92.56987457	91.28480264
190828A00009	8/28/2019	1.71	8/28/2024	8/28/2019	101.34906	99.55840573	97.80780023	96.09611044	94.42224071	92.78513346	91.18376759	89.61715697	88.08434904
200429A00047	5/1/2020	2.7	4/30/2025	5/1/2020	104.53144	102.0543608	99.64904389	97.31299864	95.04383496	92.83926015	90.69707429	88.6151658	86.59150739
201028A00006	10/30/2020	1.56	2/15/2024	10/30/2020	100.68325	99.40944241	98.16205566	96.94026754	95.74329471	94.57038596	93.42082059	92.29390685	91.18898044
180810A00028	8/10/2018	2.91	8/10/2023	8/10/2018	101.563	100.7845887	100.0181069	99.26327917	98.5198408	97.78753522	97.06611351	96.35533412	95.6549626
190712A00009	7/12/2019	2.19	7/12/2023	7/12/2019	100.86228	100.1656158	99.47855656	98.8009079	98.13247736	97.47307762	96.82252646	96.1806465	95.54726511
200130A00028	1/30/2020	1.54	2/7/2023	1/30/2020	100.32392	100.049781	99.77714351	99.50599675	99.23632851	98.96812666	98.70137921	98.43607431	98.17220023
200925A00002	9/25/2020	0.74	9/25/2025	9/25/2020	99.667367	96.87159705	94.16768039	91.55212437	89.02158802	86.57287492	84.2029261	81.90881339	79.68773303
171005A00006	10/5/2017	2.32	10/7/2024	10/5/2017	102.90833	100.9917704	99.12041086	97.29291571	95.50799556	93.76440756	92.0609533	90.39647697	88.76986352
190108A00039	1/8/2019	3.04	4/30/2024	1/8/2019	103.02853	101.5399672	100.0804801	98.64928683	97.2456375	95.86880803	94.51809923	93.19283575	91.892365
191001A00023	10/1/2019	1.85	9/27/2024	10/1/2019	101.71133	99.83738848	98.00703315	96.21899708	94.4720546	92.76502349	91.09676313	89.46617275	87.87218981
200207A00018	2/7/2020	2.14	2/7/2030	2/7/2020	109.44534	102.3390303	95.74610691	89.62676809	83.94449338	78.66576057	73.75978461	69.1982806	64.9552485
200601A00006	6/1/2020	0.6	6/1/2023	6/1/2020	99.835373	99.25266516	98.67672251	98.10742799	97.54466716	96.9883282	96.43830182	95.8944812	95.35676191
210312A00010	3/12/2021	0.63	3/12/2024	3/12/2021	99.45	98.11778086	96.80946381	95.52446204	94.26220751	93.02215015	91.80375715	90.60651233	89.42991547
060308A00014	3/8/2006	5.44	3/16/2026	3/8/2006	115.6693	112.1592319	108.7775068	105.5187465	102.3778245	99.34985508	96.43018103	93.61436173	90.89816186
090226A00006	2/26/2009	4.55	3/1/2024	2/26/2009	104.89413	103.5493637	102.2282762	100.9302917	99.65485496	98.40142792	97.16948942	95.95853428	94.76807282
150601A00930	6/1/2015	7.1	8/30/2030	6/1/2015	147.0477	138.0116865	129.6411787	121.8826971	114.6873462	108.0104034	101.8109417	96.0514887	90.69771848
200302A00051	3/2/2020	1.22	8/8/2023	3/2/2020	100.16986	99.4037092	98.6492324	97.90616044	97.17423622	96.45321036	95.74284084	95.04289278	94.35313815
210323A00007	3/23/2021	0.51	3/25/2024	3/23/2021	99.426597	98.05847142	96.71548471	95.39700543	94.1024229	92.83114625	91.58260367	90.35624159	89.15152399
111024A00027	10/24/2011	3.11	10/30/2023	10/24/2011	102.15508	101.1565498	100.1775205	99.21742817	98.27572721	97.35189281	96.44541995	95.55582249	94.68263228
121116A00021	11/16/2012	2.35	11/17/2025	11/16/2012	105.00064	101.9785177	99.05946339	96.23938181	93.51436802	90.8806946	88.33480242	85.87329198	83.4929152
170530A00064	5/30/2017	2.32	3/27/2023	5/30/2017	100.66935	100.2632	99.86032604	99.46068586	99.06424063	98.67095216	98.28078286	97.89369574	97.50965438
180622A00006	6/22/2018	3.53	12/21/2029	6/22/2018	119.18133	111.8565664	105.0455938	98.70944166	92.8123002	87.32124508	82.20599026	77.43866338	72.99360137
180808A00009	8/8/2018	3.12	8/7/2023	8/8/2018	101.6429	100.8731416	100.115036	99.36832205	98.63274422	97.90805456	97.19401242	96.49038423	95.7969432
191121A00009	11/21/2019	2.55	11/21/2036	11/21/2019	117.74691	104.3836155	92.73370104	82.56573198	73.68073208	65.90748009	59.09851083	53.12670962	47.88240964

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
120312A00009	3/12/2012	2.72	3/15/2024	3/12/2012	102.49763	101.1330492	99.79309604	98.47715975	97.18465044	95.91499716	94.66764709	93.4420648	92.23773163
160329A00045	3/29/2016	2.12	3/29/2024	3/29/2016	101.70876	100.3134041	98.94383843	97.59940911	96.27948525	94.98345664	93.71073289	92.46074261	91.23293265
160802A00003	8/2/2016	2.53	8/1/2031	8/2/2016	114.29851	105.6114318	97.66198478	90.38339911	83.71528349	77.60298636	71.99702238	66.8525589	62.1289561
171011A00013	10/11/2017	2.77	10/13/2026	10/11/2017	108.14018	104.1980092	100.4226615	96.80620734	93.3411341	90.02032375	86.83702995	83.78485668	80.85773818
190703A00017	7/3/2019	2.33	5/4/2026	7/3/2019	105.46702	102.0006604	98.66741101	95.46144592	92.37722877	89.40949467	86.55323533	83.80368506	81.15630761
190923A00078	9/23/2019	1.96	6/28/2024	9/23/2019	101.60562	99.97129183	98.37086955	96.80335873	95.26780705	93.7632989	92.28895367	90.84392401	89.42739426
191031A00041	10/31/2019	1.72	10/31/2023	10/31/2019	100.75752	99.76387345	98.78972803	97.83451628	96.89769074	95.97872485	95.077112	94.19236458	93.32401305
200210A00005	2/10/2020	1.77	2/10/2027	2/10/2020	105.28044	101.0646109	97.04080216	93.19924444	89.53072192	86.02653607	82.67847355	79.47877628	76.42011361
200309A00021	3/9/2020	1.05	3/9/2026	3/9/2020	100.86892	97.62636359	94.50405975	91.49694391	88.60019535	85.80921987	83.11963789	80.52727338	78.02814325
200424A00006	4/24/2020	0.6	4/24/2023	4/24/2020	99.956956	99.47599751	98.99965482	98.52786215	98.0605545	97.59766813	97.1391405	96.68491024	96.23491713
161109A00018	11/9/2016	2.63	11/9/2026	11/9/2016	107.76609	103.7604997	99.92729553	96.25814571	92.74516274	89.38088088	86.15823122	83.07051833	80.11139854
170515A00010	5/15/2017	2.58	5/15/2024	5/15/2017	102.39325	100.8704315	99.37776806	97.91443815	96.47964588	95.07262374	93.69263133	92.33895413	91.01090242
180412A00036	4/12/2018	3.54	4/15/2038	4/12/2018	132.41955	116.9203221	103.5355868	91.95912042	81.93081928	73.22953315	65.66704039	59.082982	53.34059754
180717A00076	7/17/2018	3.03	7/17/2023	7/17/2018	101.47606	100.7635122	100.0609711	99.36822692	98.68507539	98.01131808	97.34676194	96.69121921	96.04450721
210128A00008	1/28/2021	0.54	4/9/2024	1/28/2021	99.283453	97.87980207	96.50260697	95.15118612	93.82488112	92.5230555	91.24509381	89.99040076	88.75840038
211222A00024	12/22/2021	1.13	4/15/2024	12/22/2021	100.14192	98.71581855	97.31688573	95.94440945	94.59770638	93.27611626	91.97900087	90.70574315	89.45574632
221031A00045	10/31/2022	4.79	10/31/2025	10/31/2022	111.83173	108.76169	105.7940962	102.9249515	100.1504402	97.46691689	94.87089772	92.35905227	89.9281959
150519A00013	5/19/2015	2.98	5/19/2025	5/19/2015	105.34933	102.8119448	100.3490072	97.95789137	95.63608048	93.38116214	91.19082355	89.06284662	86.99510345
160706A00029	7/6/2016	2.49	7/8/2030	7/6/2016	112.24505	104.6577827	97.64432037	91.15813438	85.15670674	79.6011615	74.45593473	69.68847601	65.26897836
180925A00060	9/25/2018	3.23	8/25/2023	9/25/2018	101.81512	100.9963444	100.1907348	99.39797531	98.61776014	97.84979304	97.09378708	96.34946422	95.61655497
200123A00048	1/23/2020	1.7	1/23/2025	1/23/2020	102.04001	99.84837674	97.71429075	95.63581671	93.61110546	91.63838526	89.71595786	87.84219467	86.01553333
160119A00028	1/19/2016	3.34	1/21/2031	1/19/2016	119.36302	111.0098855	103.3208979	96.23936763	89.71373497	83.69708292	78.14669599	73.02366306	68.29251976
170313A00035	3/13/2017	3.31	3/15/2027	3/13/2017	111.52279	107.1001536	102.8807427	98.85416417	95.01061045	91.34082219	87.8360548	84.48804728	81.28899306
170322A00025	3/22/2017	3.58	3/22/2033	3/22/2017	124.28756	113.7408078	104.2192899	95.61675327	87.83849977	80.80007863	74.42612976	68.64936258	63.40965414
180329A00003	3/29/2018	3.08	3/29/2028	3/29/2018	113.83635	108.317764	103.1049005	98.17921517	93.52337926	89.12119577	84.95752012	81.01818659	77.28994026
181119A00018	11/19/2018	3.28	11/17/2023	11/19/2018	102.32792	101.2818843	100.2572377	99.2533323	98.26954251	97.30526758	96.35993051	95.43297689	94.52387376
190215A00006	2/15/2019	2.89	2/15/2024	2/15/2019	102.41532	101.1296681	99.87063111	98.63738755	97.42914872	96.24515825	95.08469047	93.94704886	92.83156454
201028A00004	10/30/2020	1.55	12/29/2023	10/30/2020	100.57145	99.42426822	98.30310255	97.20708098	96.1353656	95.08715532	94.06168392	93.05821813	92.0760559
130606A00013	6/6/2013	2.94	6/15/2023	6/6/2013	101.27535	100.6499223	100.0322205	99.42210077	98.81942393	98.22405422	97.63585916	97.05470946	96.48047892
150601A00531	6/1/2015	3.28	7/24/2024	6/1/2015	103.89486	102.1724507	100.4868167	98.83684807	97.22147616	95.63967539	94.09046104	92.57288715	91.08604459
160129A00068	1/29/2016	1.97	1/30/2023	1/29/2016	100.41892	100.1666375	99.91562133	99.66586053	99.41734567	99.17006749	98.92401679	98.67918447	98.43556154
160701A00020	7/1/2016	2.13	7/1/2026	7/1/2016	105.07648	101.4642453	97.9956596	94.66420534	91.46370172	88.38828388	85.43238458	82.59071723	79.85825993
160712A00023	7/12/2016	1.79	7/12/2023	7/12/2016	100.58089	99.88531937	99.19935129	98.52278324	97.85542287	97.19708306	96.54758172	95.90674164	95.27439035

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160830A00035	8/30/2016	2.06	8/30/2024	8/30/2016	101.99906	100.1970689	98.4354574	96.71309071	95.02886915	93.38173078	91.77064987	90.19463542	88.65272976
190919A00025	9/19/2019	1.8	9/19/2024	9/19/2019	101.83173	99.97347468	98.15806285	96.38426081	94.65087378	92.95674892	91.30077365	89.68187392	88.09901262
200305A00035	3/5/2020	1.25	3/5/2026	3/5/2020	101.52912	98.28558858	95.16187562	92.15296062	89.25405509	86.46059483	83.76822818	81.17280507	78.67036657
200709A00007	7/10/2020	1.67	7/9/2027	7/10/2020	104.84692	100.2674705	95.91372914	91.77337443	87.83482427	84.08718923	80.520227	77.1243002	73.89033717
210312A00004	3/12/2021	0.34	3/10/2023	3/12/2021	99.936018	99.5776581	99.22187136	98.86863046	98.51790804	98.16967714	97.82391118	97.48058396	97.13966966
130904A00036	9/4/2013	3.57	9/15/2023	9/4/2013	102.31432	101.4356477	100.5720826	99.72323736	98.88873752	98.06822123	97.2613387	96.46775176	95.68713332
170111A00013	1/11/2017	3.4	1/10/2031	1/11/2017	119.81087	111.4674146	103.7848468	96.70694177	90.18255291	84.16512352	78.61225224	73.48530162	68.74904551
181210A00015	12/10/2018	3.12	12/11/2023	12/10/2018	102.30058	101.1906474	100.1047921	99.04224092	98.00224882	96.98410246	95.98711825	95.01064086	94.05404183
191104A00022	11/4/2019	2.17	8/4/2027	11/4/2019	107.24646	102.5461828	98.07974915	93.83426718	89.79762462	85.95844074	82.30601777	78.83029594	75.52181171
191126A00026	11/26/2019	1.91	11/25/2026	11/26/2019	105.49109	101.4732719	97.6307789	93.95502801	90.43790679	87.07174194	83.84927294	80.76362749	77.80829861
200130A00006	1/30/2020	1.77	1/30/2025	1/30/2020	101.9284	99.72572128	97.58116696	95.49277262	93.45865996	91.4770299	89.54615851	87.66439308	85.83014855
200218A00004	2/18/2020	1.73	2/21/2023	2/18/2020	100.37825	100.0658229	99.75534182	99.44678921	99.14014716	98.83539794	98.53252405	98.23150819	97.93233328
220902A00043	9/2/2022	3.91	3/4/2024	9/2/2022	103.89487	102.5517757	101.2324239	99.93623399	98.66264771	97.41112411	96.18113912	94.97218486	93.78376899
171227A00018	12/27/2017	2.83	12/27/2024	12/27/2017	104.12809	101.9890588	99.90453568	97.87275064	95.89200479	93.96066776	92.07717425	90.24002089	88.44776323
180904A00012	9/4/2018	3.35	9/4/2030	9/4/2018	120.12613	112.0466318	104.5845863	97.68931263	91.31453675	85.41799098	79.96104853	74.90839289	70.22771875
190529A00089	5/29/2019	2.38	5/29/2024	5/29/2019	102.14417	100.5866069	99.06029782	97.56436982	96.09798161	94.66032264	93.25061174	91.86809568	90.512048
200306A00065	3/6/2020	1.38	3/6/2030	3/6/2020	103.98496	97.00172448	90.53208322	84.53574767	78.97577554	73.81827837	69.03215523	64.58885091	60.4621361
151223A00066	12/23/2015	2.34	12/23/2022	12/23/2015	100.33401	100.18683	100.0400936	99.89379841	99.7479425	99.60252385	99.45754048	99.31299039	99.16887163
171206A00040	12/6/2017	2.23	12/6/2022	12/6/2017	100.23051	100.1305292	100.0307578	99.93119492	99.83184	99.73269233	99.63375123	99.53501603	99.43648605
181114A00012	11/14/2018	3.13	11/14/2022	11/14/2018	100.1282	100.0892763	100.0504024	100.0115752	99.97279474	99.93406087	99.89537352	99.8567326	99.81813802
190529A00028	5/29/2019	2.38	5/29/2024	5/29/2019	102.14417	100.5866069	99.06029782	97.56436982	96.09798161	94.66032264	93.25061174	91.86809568	90.512048
200818A00006	8/18/2020	1.18	8/18/2028	8/18/2020	102.88276	97.32700935	92.10253843	87.18795524	82.56335364	78.210204	74.11125112	70.25042024	66.61273046
200826A00040	8/28/2020	0.92	10/27/2023	8/28/2020	99.844469	98.86787123	97.9102503	96.97105745	96.04976523	95.14586612	94.25887165	93.38831145	92.53373247
110824A00004	8/24/2011	3.11	8/30/2023	8/24/2011	101.82363	100.9902756	100.1705514	99.36412219	98.57066649	97.78987304	97.02144048	96.26507695	95.52049973
160616A00027	6/16/2016	2.27	6/16/2026	6/16/2016	105.50077	101.9208152	98.48184482	95.17752319	92.00183989	88.94908825	86.01384811	83.19096964	80.47555813
180702A00012	7/2/2018	3.01	7/3/2023	7/2/2018	101.39854	100.7240504	100.0585192	99.40177345	98.75363998	98.11395018	97.48253981	96.85924887	96.24392143
190110A00004	1/10/2019	3.09	1/10/2025	1/10/2019	104.78048	102.5974753	100.4708085	98.39861703	96.37911982	94.41060893	92.49144586	90.62005812	88.79493593
190514A00021	5/14/2019	2.72	11/14/2025	5/14/2019	105.71009	102.6946225	99.78149797	96.96666658	94.24626688	91.61661211	89.07418122	86.61561033	84.23768478
190812A00003	8/12/2019	1.67	8/12/2024	8/12/2019	101.46017	99.70597961	97.9902977	96.31198019	94.66993069	93.06309477	91.49045797	89.95104387	88.44391228
200331A00060	3/31/2020	1.09	3/31/2025	3/31/2020	100.47165	98.12458785	95.84368752	93.62672515	91.47156244	89.37614523	87.33849954	85.35672806	83.42900664
200408A00021	4/8/2020	0.99	4/4/2025	4/8/2020	100.54369	98.17871955	95.88083086	93.64775175	91.47730127	89.36738482	87.3159902	85.32118384	83.38110722
140815A00032	8/15/2014	3.59	10/15/2029	8/15/2014	119.24758	112.0963921	105.4355943	99.22880445	93.4425205	88.04588062	83.01044251	78.30998206	73.92030974
180817A00022	8/17/2018	2.87	8/17/2023	8/17/2018	101.56337	100.7661337	99.9814045	99.20889328	98.44831605	97.69939757	96.96187099	96.23547759	95.51996641

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190620A00045	6/20/2019	2.14	6/20/2024	6/20/2019	101.85554	100.2409755	98.65959685	97.11044907	95.59260998	94.10519254	92.64734315	91.21824001	89.81709164
190807A00036	8/7/2019	1.75	8/7/2023	8/7/2019	100.58094	99.81570931	99.06208439	98.3198035	97.58861193	96.86826256	96.15851558	95.45913817	94.76990432
200310A00065	3/13/2020	1.1	3/13/2025	3/13/2020	100.48109	98.17966603	95.9419498	93.76583194	91.64928939	89.59037707	87.58722448	85.63803233	83.74106948
130531A00021	5/31/2013	3.22	5/30/2028	5/31/2013	114.98517	109.2695417	103.878797	98.79270849	93.99240977	89.46030077	85.17995624	81.13604121	77.31423299
170327A00070	3/29/2017	3.05	3/29/2027	3/29/2017	111.13359	106.6639299	102.4018757	98.33670873	94.45831471	90.75715031	87.22420809	83.85098359	80.62944478
181004A00028	10/4/2018	3.31	10/4/2023	10/4/2018	102.09512	101.1679532	100.2576213	99.36367184	98.48566539	97.62317796	96.77580051	95.94313827	95.12481014
200407A00002	4/8/2020	1.82	4/8/2024	4/8/2020	101.13711	99.72212965	98.33374318	96.97127003	95.63404909	94.32144125	93.03282851	91.76761308	90.52521656
200508A00004	5/8/2020	0.43	5/8/2023	5/8/2020	99.842837	99.32428478	98.81110405	98.30321125	97.80052489	97.30296516	96.81045387	96.32291442	95.84027177
201030A00001	11/2/2020	2.54	10/29/2040	11/2/2020	114.30793	98.52213325	85.23151405	74.02138392	64.54825942	56.52730706	49.72205601	43.93595861	39.00545929
191115A00030	11/15/2019	2.35	11/9/2029	11/15/2019	110.77643	103.8494303	97.40722514	91.41331038	85.8341135	80.63874116	75.79875246	71.28795252	67.08220438
200304A00052	3/6/2020	2.11	3/8/2027	3/6/2020	106.269	101.9779917	97.88479409	93.97929502	90.25195143	86.69375252	83.29618752	80.05121543	76.95123676
200310A00019	3/10/2020	0.95	3/10/2023	3/10/2020	100.12386	99.76544395	99.40959535	99.05628793	98.70549447	98.35718812	98.01134243	97.66793131	97.32692905
220505A00026	5/9/2022	2.69	8/22/2023	5/9/2022	101.35848	100.5497961	99.75400442	98.97079532	98.19987198	97.44094681	96.69374115	95.95798493	95.23341631
180820A00036	8/20/2018	3	8/21/2023	8/20/2018	101.61498	100.8077273	100.0132965	99.2313827	98.46169159	97.70393795	96.95784544	96.22314614	95.49958033
181227A00026	12/27/2018	3.03	12/27/2023	12/27/2018	102.29257	101.1400476	100.0134744	98.91198446	97.83474662	96.78096605	95.74988236	94.74076771	93.75292508
200226A00014	2/26/2020	1.53	2/27/2023	2/26/2020	100.32353	99.99475372	99.66812301	99.3436182	99.02121863	98.70090393	98.38265397	98.06644891	97.75226913
200720A00044	7/22/2020	2.22	7/21/2026	7/22/2020	105.5137	101.8418575	98.31776363	94.93462618	91.68601222	88.5658224	85.56827144	82.68786978	79.91940652
200922A00038	9/24/2020	2.33	9/25/2023	9/24/2020	101.16131	100.2627009	99.38001221	98.51282758	97.66074125	96.82336147	96.00030993	95.19122123	94.39574227
211217A00021	12/21/2021	2.44	12/18/2026	12/21/2021	107.24688	103.1483492	99.23004682	95.48306811	91.89900012	88.46989054	85.1882197	82.04687442	79.0391237
180207A00003	2/7/2018	3.28	2/7/2028	2/7/2018	113.78963	108.4362331	103.3715984	98.57856554	94.04108723	89.74415113	85.67370726	81.81660094	78.16051089
190528A00005	5/28/2019	2.42	6/15/2023	5/28/2019	100.94826	100.3239998	99.70744971	99.09847161	98.49692646	97.90267864	97.3155958	96.7355488	96.16241157
200121A00009	1/24/2020	1.94	1/24/2025	1/24/2020	102.29268	100.1013389	97.96746589	95.88913483	93.86450003	91.89179311	89.96931895	88.095452	86.26863272
200303A00007	3/3/2020	1.11	3/4/2024	3/3/2020	100.26966	98.94969739	97.65311381	96.37934629	95.12784539	93.89807888	92.68953107	91.50170214	90.3341076
200604A00004	6/4/2020	0.76	6/4/2024	6/4/2020	99.575597	98.02324721	96.50229807	95.01186326	93.55108986	92.11915646	90.71527171	89.33867292	87.98862477
221011A00036	10/11/2022	4.59	10/6/2026	10/11/2022	115.22649	111.16384	107.270757	103.5392546	99.96176251	96.53110526	93.24047927	90.08343167	87.05384034
150601A00485	6/1/2015	3.09	6/21/2024	6/1/2015	103.56685	101.931333	100.3294886	98.76034445	97.22296271	95.71644139	94.23991256	92.7925408	91.37352158
151223A00077	12/23/2015	3.57	12/24/2035	12/23/2015	130.11129	116.7139587	104.910906	94.50053304	85.30784242	77.18080159	69.98721788	63.61205298	57.95511305
161214A00023	12/14/2016	3.3	12/15/2031	12/14/2016	121.38218	112.0506944	103.5335936	95.75492032	88.6461932	82.14563193	76.19746912	70.75133623	65.76171503
170809A00005	8/9/2017	2.61	8/11/2025	8/9/2017	104.85074	102.0979978	99.43166703	96.84850886	94.34543201	91.91948109	89.56782963	87.28777346	85.07672454
190529A00032	5/29/2019	2.38	5/29/2024	5/29/2019	102.14417	100.5866069	99.06029782	97.56436982	96.09798161	94.66032264	93.25061174	91.86809568	90.512048
190613A00011	6/13/2019	2.26	6/13/2024	6/13/2019	102.03726	100.4398203	98.87496826	97.34177051	95.83933041	94.36678507	92.92330371	91.50808614	90.12036139
190805A00050	8/5/2019	1.91	8/5/2024	8/5/2019	101.63615	99.90270971	98.20689942	96.54758731	94.92368393	93.33414312	91.77795976	90.25416776	88.76183811
200501A00003	5/1/2020	0.66	4/14/2023	5/1/2020	99.960852	99.50752483	99.0583045	98.61313502	98.17196168	97.73473077	97.30138956	96.87188621	96.44616985

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210609A00013	6/11/2021	1.64	6/11/2025	6/11/2021	101.98999	99.43572854	96.95804051	94.55416011	92.22144463	89.95736404	87.75949535	85.62551729	83.5532053
220819A00038	8/19/2022	3.59	8/19/2024	8/19/2022	104.72629	102.9275911	101.1685548	99.44802789	97.7649028	96.11811249	94.50662877	92.92946051	91.385652
150601A00495	6/1/2015	2.99	6/27/2024	6/1/2015	103.4449	101.794028	100.1773714	98.59393352	97.04275371	95.52290832	94.03350903	92.57370104	91.14266151
190110A00010	1/10/2019	2.97	1/16/2024	1/10/2019	102.33228	101.1263645	99.94885047	98.79874662	97.67510341	96.57701478	95.50361564	94.45407956	93.42761666
200317A00026	3/17/2020	1.22	3/15/2024	3/17/2020	100.26072	98.91492538	97.59340056	96.29554244	95.02077126	93.76852574	92.53826231	91.32945447	90.14159211
210818A00005	8/18/2021	0.6	8/19/2024	8/18/2021	99.542847	97.78825114	96.07258253	94.39470923	92.75354143	91.14802941	89.57716171	88.03996337	86.53549432
180823A00033	8/23/2018	2.85	8/23/2023	8/23/2018	101.57418	100.7607669	99.96037048	99.17268082	98.39739694	97.63422727	96.8828893	96.14310927	95.41462179
190114A00061	1/14/2019	2.98	1/31/2024	1/14/2019	102.42653	101.1802224	99.96421486	98.77741004	97.61876509	96.48728636	95.38202643	94.30208153	93.24658896
191009A00017	10/9/2019	1.76	10/4/2024	10/9/2019	101.56001	99.66926131	97.82291202	96.01965174	94.25822076	92.53740449	90.85603151	89.21297175	87.60713473
191023A00006	10/23/2019	1.95	10/23/2024	10/23/2019	101.99143	100.0474228	98.15019532	96.29833019	94.49046727	92.7252965	91.00155571	89.31802846	87.67354211
200302A00045	3/4/2020	1.31	3/4/2025	3/4/2020	100.96654	98.68224754	96.46056082	94.2994346	92.1968986	90.15105778	88.16008898	86.22223782	84.33581571
151106A00011	11/6/2015	3.1	1/15/2026	11/6/2015	107.31691	104.1125476	101.021347	98.03862987	95.15994553	92.38105568	89.69792258	87.10669816	84.60371368
191009A00028	10/9/2019	1.76	10/9/2024	10/9/2019	101.57415	99.67039895	97.81164102	95.99654726	94.22383241	92.4922576	90.80062832	89.14779251	87.5326388
210129A00008	1/29/2021	0.62	10/8/2024	1/29/2021	99.352029	97.47300075	95.63842541	93.84698693	92.09741667	90.38849168	88.71903274	87.08790248	85.4940036
211222A00003	12/22/2021	1.33	1/15/2025	12/22/2021	100.91157	98.75909994	96.66267548	94.62043757	92.63060156	90.69145667	88.80136223	86.95874415	85.1620916
211222A00031	12/22/2021	1.33	1/15/2025	12/22/2021	100.91157	98.75909994	96.66267548	94.62043757	92.63060156	90.69145667	88.80136223	86.95874415	85.1620916
221018A00048	10/18/2022	4.71	10/19/2026	10/18/2022	115.853	111.7431091	107.8060541	104.0336303	100.4180623	96.95198356	93.62841259	90.44073096	87.3826623
170508A00010	5/8/2017	2.43	5/8/2024	5/8/2017	102.32676	100.8195985	99.34214751	97.89359975	96.47317828	95.08013355	93.71374215	92.37330577	91.05815003
180531A00015	5/31/2018	2.95	5/31/2023	5/31/2018	101.21853	100.6338965	100.0560045	99.48473578	98.91997691	98.3616172	97.80954844	97.26366483	96.72386294
190130A00020	1/30/2019	2.97	4/17/2023	1/30/2019	101.03187	100.5674504	100.1073077	99.65138037	99.19961051	98.75194134	98.30831711	97.86868304	97.43298537
190327A00032	3/27/2019	2.53	1/26/2024	3/27/2019	101.8378	100.6086157	99.40903212	98.23799105	97.0944828	95.97754476	94.88625875	93.81974847	92.77717714
190528A00009	5/28/2019	2.45	5/15/2024	5/28/2019	102.19197	100.6707665	99.17969191	97.71792335	96.28466565	94.87915199	93.50064266	92.14842382	90.8218064
191226A00019	12/26/2019	2.4	12/22/2028	12/26/2019	110.29563	104.2047418	98.49211578	93.13224769	88.10148845	83.37789548	78.94110066	74.77218934	70.85358917
200505A00005	5/5/2020	0.77	5/5/2025	5/5/2020	100.02492	97.5852566	95.21705124	92.91780635	90.68512291	88.51670047	86.41033237	84.36390134	82.37537524
181123A00016	11/23/2018	3.19	11/23/2022	11/23/2018	100.20802	100.1441511	100.0803718	100.0166844	99.95308874	99.88958471	99.82617207	99.76285064	99.69962023
190530A00029	5/30/2019	2.25	5/30/2024	5/30/2019	102.14631	100.5826376	99.05042977	97.54880086	96.07690171	94.6339143	93.21905034	91.83154987	90.47068003
191203A00004	12/4/2019	1.87	12/4/2024	12/4/2019	101.97733	99.92176317	97.91763576	95.96331201	94.05722501	92.19786908	90.38379687	88.61361659	86.88598946
200207A00009	2/7/2020	1.58	2/7/2025	2/7/2020	101.81708	99.58712171	97.4166513	95.30367771	93.24628999	91.24265602	89.29101853	87.38969137	85.53705601
200304A00054	3/6/2020	2.35	3/8/2027	3/6/2020	107.30862	102.9951991	98.88033704	94.95388907	91.2062825	87.62847841	84.21193922	80.94859843	77.83083227
200604A00013	6/4/2020	2.21	6/4/2035	6/4/2020	111.1155	99.44089332	89.133979	80.02615168	71.97041994	64.83853797	58.51853042	52.91255472	47.9350536
210527A00009	5/27/2021	0.5	5/28/2024	5/27/2021	99.362971	97.82743278	96.32278725	94.84817052	93.40275081	91.98572677	90.59632604	89.23380393	87.8974422
210816A00003	8/16/2021	0.71	8/16/2024	8/16/2021	99.511687	97.7692611	96.06527652	94.39860822	92.7681736	91.17293051	89.61187532	88.0840412	86.58849639
180530A00028	5/30/2018	3.67	5/31/2033	5/30/2018	125.48492	114.7083595	104.9946134	96.23187001	88.32066843	81.17247425	74.70842698	68.85823664	63.55921132

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190308A00007	3/8/2019	2.8	3/8/2024	3/8/2019	102.4125	101.0694408	99.75029551	98.45447736	97.18142075	95.93057792	94.70141822	93.49342751	92.30610749
200203A00004	2/3/2020	1.7	2/3/2023	2/3/2020	100.33116	100.0683276	99.8068668	99.54677024	99.28802731	99.03062749	98.77456035	98.51981559	98.26638298
200326A00026	3/26/2020	1.32	3/26/2024	3/26/2020	100.40336	99.02812989	97.67816751	96.3528335	95.05151378	93.77361417	92.51855964	91.28579353	90.07477683
170622A00036	6/22/2017	3.23	6/22/2032	6/22/2017	119.94826	110.2766981	101.4903093	93.50269911	86.23634347	79.62163875	73.5960548	68.10338226	63.09306345
180706A00013	7/6/2018	3.01	7/6/2023	7/6/2018	101.41208	100.7294376	100.055981	99.39152425	98.7358878	98.08889672	97.45038074	96.82017401	96.19811499
190530A00024	5/30/2019	2.25	5/30/2024	5/30/2019	102.14631	100.5826376	99.05042977	97.54880086	96.07690171	94.6339143	93.21905034	91.83154987	90.47068003
190606A00029	6/6/2019	2.96	6/6/2034	6/6/2019	119.18395	107.8570114	97.75098033	88.72637343	80.6603578	73.44468591	66.98389541	61.1937393	55.99981576
190816A00033	8/16/2019	1.77	8/16/2024	8/16/2019	101.42205	99.66192015	97.94055575	96.25682564	94.60963842	92.99794347	91.42072903	89.87702044	88.36587837
200306A00039	3/6/2020	0.88	3/6/2023	3/6/2020	100.10251	99.75506773	99.41003302	99.06738402	98.727096	98.38914459	98.05350574	97.72015575	97.38907123
200709A00003	7/10/2020	1.63	7/10/2026	7/10/2020	103.28195	99.67956882	96.22159737	92.90143942	89.7128398	86.6498654	83.70688647	80.8785591	78.15980883
170502A00028	5/2/2017	2.84	5/3/2027	5/2/2017	110.46193	105.9126891	101.5792651	97.45027737	93.51500321	89.76333843	86.18575849	82.77328211	79.51743742
190102A00050	1/2/2019	3.38	1/3/2034	1/2/2019	124.92932	113.5647819	103.3812085	94.24808488	86.05000485	78.68485002	72.062196	66.10191722	60.73296458
190809A00010	8/9/2019	1.88	8/8/2024	8/9/2019	101.59316	99.85228923	98.14936037	96.48324077	94.85284051	93.25711227	91.69504917	90.16568284	88.66808152
201006A00007	10/8/2020	1.47	10/10/2023	10/8/2020	100.38933	99.45472089	98.53743198	97.63698814	96.75292869	95.88480963	95.03220285	94.19469547	93.37188915
211222A00019	12/22/2021	0.97	10/16/2023	12/22/2021	99.91033	98.9623081	98.03217109	97.11941707	96.22356246	95.34414147	94.4807053	93.63282136	92.80007253
160401A00016	4/1/2016	2.42	4/1/2025	4/1/2016	103.69525	101.3059716	98.98386127	96.72666115	94.53220103	92.39839609	90.32324305	88.30481644	86.3412651
160630A00011	6/30/2016	1.8	6/30/2023	6/30/2016	100.57381	99.91050292	99.25590699	98.60985526	97.97218147	97.34272361	96.72132384	96.10782832	95.50208711
170215A00040	2/15/2017	2.59	5/15/2023	2/15/2017	100.95223	100.4118699	99.87729171	99.34840656	98.82512366	98.30735421	97.79501125	97.28800964	96.78626604
181005A00011	10/5/2018	3.2	10/5/2023	10/5/2018	102.09992	101.1686182	100.2543048	99.35651471	98.47480267	97.60873938	96.75791067	95.92191692	95.10037236
190816A00013	8/16/2019	2.2	8/16/2029	8/16/2019	109.59072	102.9165652	96.69615996	90.89628252	85.4863069	80.43798877	75.72526845	71.32409128	67.21224368
191004A00004	10/4/2019	1.54	10/4/2024	10/4/2019	101.38229	99.48868641	97.63963608	95.83382177	94.06997738	92.34688226	90.66335921	89.01827269	87.410527
191015A00013	10/15/2019	1.72	10/15/2024	10/15/2019	101.76496	99.83912007	97.95923355	96.12392416	94.3318671	92.58178587	90.87245018	89.20267395	87.5713134
191021A00021	10/21/2019	2.22	12/21/2027	10/21/2019	108.06269	102.9816066	98.17078754	93.61443066	89.2977396	85.20685673	81.3287984	77.65139513	74.16323616
091210A00005	12/10/2009	5.08	12/16/2024	12/10/2009	108.86762	106.7058764	104.5984187	102.543509	100.5394772	98.58471958	96.6776954	94.81692396	93.00098174
160706A00006	7/6/2016	1.47	7/6/2023	7/6/2016	100.41509	99.73548462	99.06505074	98.40360154	97.7509573	97.10694307	96.4713885	95.84412771	95.22499914
200305A00029	3/5/2020	1.14	3/5/2025	3/5/2020	100.56851	98.28640362	96.06694528	93.9080778	91.80782758	89.76429645	87.77565834	85.84015613	83.95609867
210720A00035	7/22/2021	2.27	7/21/2031	7/22/2021	110.82018	102.3653074	94.62735393	87.54160272	81.04949972	75.09803754	69.63920331	64.62948403	60.02942337
130314A00027	3/14/2013	2.38	3/15/2023	3/14/2013	100.68924	100.3154883	99.94452103	99.57630652	99.21081411	98.84801357	98.48787509	98.13036934	97.77546739
160330A00056	3/30/2016	2.26	3/31/2025	3/30/2016	103.61773	101.2255237	98.90062344	96.64076742	94.44377961	92.30756969	90.23012914	88.20952752	86.24390896
180702A00034	7/2/2018	2.86	7/3/2023	7/2/2018	101.35727	100.6821559	100.0160272	99.35870291	98.71000915	98.06977674	97.43784088	96.81404102	96.19822075
190115A00025	1/15/2019	2.96	1/12/2024	1/15/2019	102.29843	101.1033389	99.9361573	98.79591138	97.68167611	96.59256834	95.52774457	94.48639867	93.46775988
190827A00002	8/27/2019	1.74	8/27/2024	8/27/2019	101.4011	99.6125531	97.86395697	96.15417696	94.48211761	92.84672176	91.24696896	89.68187389	88.15048496
191206A00013	12/6/2019	3.05	12/6/2044	12/6/2019	125.46461	106.0849842	90.26803701	77.31873335	66.68232588	57.91532038	50.66257655	44.63922461	39.6163655

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210609A00007	6/11/2021	2.6	6/11/2029	6/11/2021	112.08178	105.4931615	99.34050137	93.59261267	88.22069673	83.19814928	78.50038222	74.10466079	69.98995466
210802A00002	8/2/2021	0.7	8/1/2025	8/2/2021	99.888789	97.22320875	94.64126477	92.13979553	89.71578278	87.36634418	85.08872602	82.88029638	80.73853872
211222A00011	12/22/2021	0.97	10/16/2023	12/22/2021	99.91033	98.9623081	98.03217109	97.11941707	96.22356246	95.34414147	94.4807053	93.63282136	92.80007253
120127A00018	1/27/2012	3.64	2/1/2027	1/27/2012	112.6004	108.2720912	104.1374538	100.1867175	96.41066278	92.80058734	89.34827385	86.04595979	82.88630949
150319A00012	3/19/2015	3.13	3/19/2029	3/19/2015	115.16756	108.6981728	102.6418991	96.9701437	91.6564317	86.67624075	82.00684791	77.62718908	73.51773001
150601A00648	6/1/2015	2.71	12/30/2022	6/1/2015	100.40949	100.2430363	100.0771294	99.91176959	99.74695426	99.58268072	99.41894635	99.25574852	99.09308463
170831A00004	8/31/2017	2	8/31/2023	8/31/2017	100.89465	100.0628723	99.24475793	98.43997308	97.64819418	96.86910809	96.10241163	95.34781121	94.60502246
180827A00020	8/27/2018	3.21	8/27/2025	8/27/2018	106.62984	103.8100421	101.079766	98.4356889	95.87462959	93.39354211	90.98950934	88.65973674	86.40154653
190625A00021	6/25/2019	1.88	6/26/2023	6/25/2019	100.68102	100.0273218	99.38209391	98.74516791	98.11638433	97.49558778	96.88262682	96.27735382	95.67962482
190807A00022	8/7/2019	1.76	1/17/2023	8/7/2019	100.30496	100.0889769	99.87393525	99.6598295	99.44665344	99.23440098	99.02306607	98.81264273	98.60312501
190809A00012	8/9/2019	1.69	8/9/2024	8/9/2019	101.48637	99.73977918	98.03137999	96.36002859	94.72462932	93.12412914	91.55751557	90.02381471	88.52208934
190829A00005	8/30/2019	2.06	8/30/2023	8/30/2019	100.86042	100.0325865	99.21829939	98.417224	97.62904098	96.85344116	96.09012517	95.33880307	94.599194
190904A00001	9/4/2019	1.5	9/4/2024	9/4/2019	101.2184	99.40620428	97.63498982	95.90359886	94.2109102	92.55584116	90.93734605	89.35441465	87.8060708
200511A00015	5/11/2020	0.6	2/1/2023	5/11/2020	100.04364	99.78679948	99.53126687	99.27703694	99.02409981	98.77244568	98.52206485	98.27294773	98.02508483
200928A00003	9/28/2020	0.55	9/26/2025	9/28/2020	99.485386	96.68108434	93.96919907	91.34620573	88.80873414	86.35356031	83.97759931	81.67789843	79.4516308
120112A00013	1/12/2012	2.76	1/16/2024	1/12/2012	102.20868	101.0015338	99.82285811	98.67165771	97.5469798	96.44791519	95.37359587	94.32319264	93.29591302
130528A00028	5/28/2013	2.63	5/30/2023	5/28/2013	101.02696	100.4456819	99.87107277	99.30302287	98.74142043	98.18615623	97.63712348	97.09421778	96.55733706
171130A00005	11/30/2017	2.45	11/30/2022	11/30/2017	100.20799	100.124763	100.0416719	99.95871648	99.8758965	99.79321161	99.7106615	99.62824588	99.54596442
190925A00011	9/25/2019	1.89	9/25/2024	9/25/2019	101.78072	99.91142209	98.08549526	96.30167382	94.5587414	92.85552462	91.19089129	89.56374867	87.97304185
200124A00008	1/24/2020	1.92	1/22/2027	1/24/2020	105.82005	101.6447029	97.65726535	93.84824482	90.20868457	86.73013014	83.40459804	80.22454656	77.18284851
171026A00011	10/26/2017	2.94	10/26/2027	10/26/2017	111.40533	106.3884525	101.6305812	97.11697835	92.83381745	88.76812515	84.90772436	81.24118123	77.75775611
190130A00019	1/30/2019	3.01	1/30/2024	1/30/2019	102.45882	101.2149462	100.0012518	98.8166438	97.66008569	96.5305896	95.42721357	94.34905893	93.29526781
190906A00005	9/6/2019	1.77	9/6/2023	9/6/2019	100.62647	99.78104904	98.94978554	98.1323227	97.32831906	96.53744432	95.75937894	94.99381367	94.24044913
191115A00016	11/18/2019	2.48	11/18/2024	11/18/2019	103.17745	101.151924	99.1763308	97.24911189	95.36877227	93.53387406	91.74303387	89.99492031	88.28825161
200203A00006	2/3/2020	1.76	2/3/2025	2/3/2020	101.91967	99.70590712	97.55081797	95.45242824	93.40884701	91.41826238	89.47893738	87.5892062	85.7474706
210916A00007	9/16/2021	0.75	9/16/2024	9/16/2021	99.596988	97.77284673	95.99061556	94.24908939	92.54710549	90.88354171	89.25731476	87.66737863	86.11272309
211001A00001	10/1/2021	0.59	10/2/2023	10/1/2021	99.565164	98.65590736	97.76313538	96.88640371	96.02528363	95.17936158	94.34823848	93.53152909	92.72886146
170803A00021	8/3/2017	2.5	8/5/2024	8/3/2017	102.68176	100.9387845	99.23361259	97.56510909	95.93217984	94.33377413	92.7688825	91.23653465	89.73579754
180118A00039	1/18/2018	3.09	1/19/2027	1/18/2018	110.16916	105.9265046	101.8729397	97.99897059	94.29564	90.75449025	87.3675322	84.12721642	81.02640621
181213A00031	12/13/2018	2.97	12/13/2023	12/13/2018	102.26635	101.1494625	100.0569547	98.98803486	97.9419448	96.91795835	95.91537991	94.93354281	93.97180782
190719A00006	7/19/2019	2.17	7/19/2024	7/19/2019	102.0436	100.3504885	98.69337134	97.07116784	95.48283798	93.92738334	92.40384498	90.91130143	89.44886688
200228A00059	2/28/2020	1.79	2/28/2030	2/28/2020	106.95567	99.88090304	93.32311665	87.24193172	81.6003081	76.36425726	71.50257699	66.98661038	62.7900267
200812A00004	8/12/2020	0.59	8/12/2025	8/12/2020	99.586842	96.89738143	94.29314395	91.77092576	89.32766524	86.96043556	84.66643773	82.44299409	80.28754214

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
211222A00023	12/22/2021	1.13	4/15/2024	12/22/2021	100.14192	98.71581855	97.31688573	95.94440945	94.59770638	93.27611626	91.97900087	90.70574315	89.45574632
170216A00043	2/16/2017	3.17	2/16/2027	2/16/2017	110.69534	106.3647574	102.2302345	98.28184793	94.51022785	90.90652674	87.46238726	84.16991244	81.0216377
180125A00022	1/25/2018	2.69	1/25/2023	1/25/2018	100.54777	100.3093483	100.0720623	99.83590379	99.60086477	99.36693729	99.13411348	98.90238553	98.67174571
180529A00042	5/29/2018	3.42	5/30/2028	5/29/2018	115.27094	109.5756206	104.2030558	99.1331911	94.347325	89.82800863	85.55895542	81.52495762	77.71180926
180904A00004	9/4/2018	2.89	9/5/2023	9/4/2018	101.66709	100.8183481	99.98375909	99.16297449	98.35565378	97.56146755	96.78009704	96.01123374	95.25457899
190708A00011	7/8/2019	2.2	7/8/2024	7/8/2019	102.03204	100.3680253	98.7389288	97.14371136	95.58137889	94.05097635	92.55158582	91.08232459	89.64234354
190815A00007	8/15/2019	1.81	7/6/2023	8/15/2019	100.58773	99.90825043	99.23792126	98.57656229	97.92399435	97.28004302	96.64453845	96.01731523	95.39821228
200130A00025	1/30/2020	1.54	1/30/2023	1/30/2020	100.31025	100.058157	99.80732352	99.55774471	99.30941114	99.06231354	98.81644273	98.57178961	98.32834518
200605A00007	6/5/2020	0.52	6/5/2023	6/5/2020	99.831315	99.23721153	98.65014829	98.07000083	97.49664751	96.92996956	96.36985094	95.81617829	95.26884086
210201A00004	2/3/2021	1.15	2/3/2025	2/3/2021	100.53618	98.33837113	96.19889896	94.11580382	92.08720423	90.11129733	88.18635489	86.31071947	84.48280092
140911A00027	9/11/2014	3.18	9/16/2024	9/11/2014	104.18186	102.3133356	100.4875608	98.70330471	96.95938194	95.25464864	93.58800061	91.95837169	90.36473222
170602A00026	6/2/2017	2.25	6/3/2024	6/2/2017	102.16534	100.5907153	99.04790771	97.53601915	96.05418575	94.60157561	93.17738728	91.78084834	90.4112141
180730A00081	7/30/2018	3.5	7/28/2028	7/30/2018	116.09839	110.2224853	104.687457	99.47162174	94.5547914	89.91816472	85.54422418	81.41664122	77.52018907
190122A00008	1/22/2019	2.98	1/20/2023	1/22/2019	100.58713	100.3624332	100.1387509	99.91607618	99.69440232	99.4737225	99.25403	99.03531817	98.8175804
190523A00018	5/23/2019	2.51	3/15/2024	5/23/2019	102.04302	100.6843525	99.35016908	98.03986561	96.75285655	95.48857504	94.24647215	93.0260162	91.8266921
190930A00069	9/30/2019	1.9	9/29/2023	9/30/2019	100.77678	99.86942248	98.97833799	98.10309214	97.24326575	96.3984543	95.56826731	94.75232774	93.9502714
200224A00019	2/24/2020	1.59	2/18/2025	2/24/2020	101.58268	99.32987094	97.13782204	95.00452972	92.9280697	90.90659371	88.93832592	87.02155959	85.15465382
200803A00011	8/3/2020	0.72	8/4/2025	8/3/2020	99.593338	96.93214762	94.35454485	91.85737928	89.43764282	87.09246179	84.81908975	82.6149009	80.47738378
210527A00008	5/27/2021	0.32	5/30/2023	5/27/2021	99.727653	99.15004699	98.57909466	98.01468197	97.45669722	96.90503123	96.35957726	95.82023099	95.28689041
220429A00002	4/29/2022	3.63	4/29/2032	4/29/2022	123.49138	113.7912117	104.9630774	96.92314364	89.59607102	82.91410953	76.81629787	71.24775106	66.15902594
171206A00010	12/6/2017	2.45	12/6/2022	12/6/2017	100.24053	100.1406618	100.0409987	99.94154268	99.84229311	99.74324931	99.64441062	99.5457764	99.44734598
180914A00028	9/14/2018	3.37	9/12/2025	9/14/2018	107.20289	104.3319854	101.5534387	98.86379357	96.25973953	93.73810757	91.29586312	88.93009962	86.63803241
190805A00049	8/5/2019	1.88	8/4/2023	8/5/2019	100.67702	99.919406	99.17315871	98.43802233	97.71375014	97.00010269	96.29684755	95.60375898	94.92061776
210414A00001	4/14/2021	0.7	5/16/2024	4/14/2021	99.497275	97.99487414	96.52231342	95.07877428	93.66346797	92.2756339	90.91453839	89.57947344	88.26975568
220815A00004	8/15/2022	3.54	2/15/2024	8/15/2022	103.26182	101.9703799	100.7056492	99.46680711	98.25306233	97.06365598	95.89785996	94.75497541	93.6343312
160628A00039	6/28/2016	2.01	6/29/2026	6/28/2016	105.1071	101.4868615	98.01070393	94.6720891	91.46481458	88.382995	85.42104377	82.57365601	79.83579252
170317A00059	3/17/2017	2.47	3/17/2023	3/17/2017	100.7303	100.350972	99.97451033	99.6008822	99.23005557	98.86199888	98.49668106	98.13407149	97.77414001
170622A00039	6/22/2017	3.36	6/22/2035	6/22/2017	124.96289	112.4263831	101.3352937	91.51268863	82.80424305	75.07524463	68.20800727	62.09963757	56.6601043
190514A00024	5/14/2019	2.34	5/14/2024	5/14/2019	102.2164	100.6942949	99.20236159	97.73977413	96.30573628	94.8994803	93.52026553	92.16737726	90.84012555
211222A00021	12/22/2021	1.06	1/16/2024	12/22/2021	100.00189	98.81097732	97.6482282	96.51264968	95.40329874	94.31927554	93.25972099	92.22381445	91.21077159
100809A00029	8/9/2010	4.23	8/15/2025	8/9/2010	109.39482	106.5676507	103.8290344	101.1756732	98.60441148	96.11223092	93.69624378	91.35368619	89.08191199
150601A00515	6/1/2015	2.95	1/16/2024	6/1/2015	102.391	101.1826756	100.0028451	98.8505086	97.72471283	96.62454811	95.54914594	94.49767668	93.46934742
160624A00011	6/24/2016	1.83	6/26/2023	6/24/2016	100.58945	99.93683645	99.29266751	98.65677813	98.02900951	97.40920687	96.79721936	96.19289989	95.59610506

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170120A00009	1/20/2017	3.67	1/22/2035	1/20/2017	128.05429	115.6938759	104.7118391	94.94455962	86.24873545	78.49875832	71.58444267	65.40905674	59.88761408
180529A00044	5/29/2018	3.11	5/29/2024	5/29/2018	103.30237	101.7352944	100.1996373	98.69452437	97.21910996	95.77257928	94.35414704	92.9630561	91.59857619
181005A00005	10/5/2018	3.31	10/5/2023	10/5/2018	102.10096	101.1710822	100.2581425	99.36168029	98.48125215	97.61643041	96.76680255	95.93197044	95.11154978
191101A00002	11/1/2019	1.85	11/1/2022	11/1/2019	100.00521	100.0024371	99.99966593	99.99689708	99.99413053	99.99136627	99.98860431	99.98584463	99.98308724
191206A00008	12/6/2019	2.44	12/6/2030	12/6/2019	112.05177	104.0999978	96.7784905	90.03385303	83.81748178	78.08510759	72.79638844	67.91454242	63.40601667
200127A00023	1/27/2020	1.8	1/27/2025	1/27/2020	101.98754	99.79193035	97.65408522	95.57206221	93.54400023	91.5681164	89.64270197	87.76611861	85.93679473
160119A00027	1/19/2016	3.25	1/18/2030	1/19/2016	117.32232	109.9906469	103.1792766	96.84834033	90.96123084	85.48432028	80.38670237	75.6399583	71.21794393
180829A00008	8/29/2018	3.23	8/30/2027	8/29/2018	113.15765	108.2273826	103.5442817	99.09467667	94.86571782	90.8453265	87.02214496	83.38548976	79.92530848
181211A00031	12/11/2018	2.95	12/11/2023	12/11/2018	102.23203	101.1206915	100.0334983	98.96966863	97.92845489	96.90914108	95.91104117	94.93349753	93.97587949
200106A00015	1/6/2020	1.87	2/15/2024	1/6/2020	101.08696	99.81039726	98.56029505	97.33583687	96.13623813	94.96074642	93.80863989	92.67922566	91.57183839
200305A00007	3/5/2020	1.14	3/5/2025	3/5/2020	100.56851	98.28640362	96.06694528	93.9080778	91.80782758	89.76429645	87.77565834	85.84015613	83.95609867
200818A00007	8/18/2020	1.31	8/20/2029	8/18/2020	103.61232	97.12621888	91.08560892	85.45769552	80.21225413	75.3214177	70.75948159	66.5027255	62.52925097
081209A00008	12/9/2008	4.87	12/15/2023	12/9/2008	104.30643	103.1737644	102.0658283	100.9818181	99.92096309	98.8825255	97.86579851	96.87010481	95.89479503
190603A00002	6/3/2019	2.03	6/2/2023	6/3/2019	100.73397	100.1449019	99.56270112	98.98725191	98.41843739	97.85614335	97.30025817	96.7506728	96.20728061
190814A00015	8/14/2019	1.84	8/14/2024	8/14/2019	101.54164	99.78561045	98.06815247	96.38813462	94.74446558	93.13609529	91.56201294	90.02124516	88.51285431
190826A00029	8/26/2019	1.53	8/26/2024	8/26/2019	101.24808	99.45933059	97.71056241	96.00063442	94.32844609	92.69293568	91.09307863	89.52788592	87.99640262
200131A00047	1/31/2020	1.68	1/31/2023	1/31/2020	100.32082	100.0662463	99.81295982	99.56094834	99.31020227	99.06071216	98.81246867	98.56546252	98.31968455
200303A00012	3/3/2020	1.71	3/1/2030	3/3/2020	106.37708	99.32050512	92.78019648	86.71579862	81.09029634	75.86972578	71.02290908	66.52121324	62.33833091
200309A00027	3/9/2020	0.97	3/10/2025	3/9/2020	100.17141	97.88133946	95.65448497	93.48876522	91.38217828	89.33279916	87.3387764	85.39832884	83.50974254
200720A00012	7/20/2020	0.77	7/15/2025	7/20/2020	99.727053	97.11469031	94.58303329	92.12907668	89.74994978	87.44290903	85.20533134	83.03470783	80.92863791
201030A00004	11/2/2020	2.56	10/29/2040	11/2/2020	114.63449	98.82198635	85.50768463	74.27650144	64.78461538	56.74690247	49.92664179	44.12706995	39.18444496
130424A00005	4/24/2013	3.07	4/24/2030	4/24/2013	117.48788	109.8517741	102.7775045	96.22059593	90.14031768	84.49934874	79.2634759	74.4013201	69.88408825
160524A00027	5/24/2016	3.06	5/27/2031	5/24/2016	117.4293	108.8339362	100.9498112	93.71396935	87.06934298	80.96417479	75.35149806	70.18867046	65.43695542
160610A00009	6/10/2016	1.89	6/12/2023	6/10/2016	100.61104	99.99606164	99.38858648	98.78847956	98.19560731	97.60983938	97.03104853	96.45911055	95.89390418
191115A00028	11/15/2019	2.34	9/28/2029	11/15/2019	110.62488	103.8074942	97.46026954	91.54832495	86.03953609	80.90430408	76.11534516	71.64749877	67.47755248
210901A00012	9/1/2021	0.51	9/1/2023	9/1/2021	99.556439	98.72926327	97.91573492	97.11551876	96.32829058	95.5537366	94.7915531	94.04144595	93.3031303
170224A00020	2/24/2017	3.08	2/24/2027	2/24/2017	110.3782	106.0311097	101.8818904	97.92051329	94.1375049	90.52391808	87.07129982	83.77166151	80.61745099
171026A00008	10/26/2017	2.6	10/25/2024	10/26/2017	103.29362	101.3311957	99.41604534	97.54674069	95.72190406	93.94020867	92.20037631	90.50117527	88.84141826
181107A00008	11/7/2018	3.42	11/7/2023	11/7/2018	102.40981	101.3900521	100.3906136	99.41089097	98.45030452	97.50829712	96.5843331	95.6778972	94.78849363
190507A00027	5/7/2019	2.59	5/7/2024	5/7/2019	102.38466	100.8827048	99.41028056	97.96658981	96.55086232	95.16235498	93.8003505	92.46415637	91.15310373
190812A00006	8/12/2019	1.86	8/12/2024	8/12/2019	101.5709	99.81981086	98.10708414	96.43158879	94.79223397	93.18797049	91.61778885	90.08071736	88.5758203
200317A00065	3/19/2020	2.05	3/19/2025	3/19/2020	102.75426	100.4100463	98.13094082	95.91478381	93.7594972	91.66308352	89.62362237	87.63926693	85.70824073
200420A00047	4/20/2020	0.77	4/20/2023	4/20/2020	100.00227	99.53254359	99.0672241	98.60624744	98.14955297	97.69708116	97.2487736	96.80457296	96.36442294

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200429A00056	5/1/2020	1.54	4/30/2025	5/1/2020	101.62945	99.18911925	96.81974322	94.51884944	92.2840717	90.11314024	88.00387717	85.95419216	83.96207832
180216A00004	2/16/2018	2.75	2/16/2023	2/16/2018	100.7014	100.401774	100.1039416	99.80788461	99.51358723	99.22103368	98.93020842	98.64109609	98.35368153
180313A00026	3/13/2018	3.34	3/13/2028	3/13/2018	114.34024	108.8766343	103.7125144	98.82988308	94.21191801	89.84288523	85.70806356	81.79367451	78.08681731
190724A00023	7/24/2019	2.13	7/24/2025	7/24/2019	103.8002	101.1009534	98.48543391	95.95050341	93.49316323	91.11054888	88.79992284	86.55866789	84.38428079
200207A00017	2/7/2020	1.96	2/8/2027	2/7/2020	105.51864	101.3198183	97.31151951	93.48407262	89.82835461	86.33575402	82.99813924	79.80782893	76.75756439
200922A00029	9/24/2020	2.73	9/25/2023	9/24/2020	101.5253	100.6248975	99.74043848	98.87150535	98.01769192	97.17860598	96.35386881	95.54311459	94.74598981
210212A00014	2/17/2021	1.38	2/17/2026	2/17/2021	101.9082	98.70207028	95.61285065	92.63564897	89.76580761	86.99888942	84.33066597	81.75710639	79.27436701
191025A00005	10/28/2019	1.98	10/28/2024	10/28/2019	102.0682	100.1105426	98.20028341	96.33598554	94.51626203	92.73977733	91.00524501	89.3114256	87.65712452
200506A00002	5/8/2020	0.97	5/5/2025	5/8/2020	100.20708	97.77196077	95.40802428	93.11277947	90.88384097	88.7189212	86.61582568	84.57244865	82.58676889
150601A00667	6/1/2015	3.88	1/16/2036	6/1/2015	131.43946	118.0294273	106.211946	95.78561737	86.57564814	78.43020358	71.21727895	64.82201168	59.14437014
170111A00012	1/11/2017	3.31	1/11/2030	1/11/2017	117.72045	110.3926496	103.5834037	97.25307921	91.36527676	85.88655219	80.78616126	76.0358281	71.60953453
190829A00029	8/29/2019	1.75	7/14/2023	8/29/2019	100.55482	99.85399266	99.16290831	98.48136735	97.809173	97.14613386	96.49206373	95.84678142	95.21011061
190919A00007	9/19/2019	2.04	9/19/2024	9/19/2019	102.04309	100.1872551	98.37412703	96.60247479	94.87110943	93.17888366	91.52469012	89.90745974	88.32616017
160815A00007	8/15/2016	2.23	8/17/2026	8/15/2016	105.698	101.9528142	98.36087386	94.91508692	91.6087326	88.43543679	85.38915202	82.46413883	79.65494824
170630A00027	6/30/2017	2.35	6/28/2024	6/30/2017	102.45502	100.8099372	99.19901016	97.62124319	96.0756757	94.5613843	93.07748089	91.62311099	90.1974521
200227A00022	2/27/2020	1.41	2/27/2023	2/27/2020	100.2839	99.95520034	99.62865169	99.30422852	98.98191021	98.66167636	98.34350687	98.02738189	97.71328179
200228A00039	2/28/2020	1.33	4/28/2023	2/28/2020	100.26836	99.77616444	99.28878552	98.80615076	98.32819122	97.8548393	97.38602867	96.92169429	96.46177235
210125A00006	1/27/2021	2.16	1/26/2027	1/27/2021	106.29617	102.1165984	98.1250009	94.31188241	90.66828278	87.1857446	83.85628183	80.67235053	77.6268216
210212A00008	2/12/2021	0.95	10/13/2026	2/12/2021	100.97206	97.17076181	93.53194622	90.0478469	86.71111327	83.51478175	80.45225344	77.517273	74.70390904
130712A00005	7/12/2013	3.25	7/17/2023	7/12/2013	101.69785	100.9835915	100.2793701	99.58497678	98.90020644	98.22485979	97.558743	96.90166752	96.25344994
170215A00043	2/15/2017	2.7	8/28/2024	2/15/2017	103.16568	101.3579046	99.59049664	97.86231416	96.17225293	94.51924712	92.90226772	91.32032097	89.77244691
190327A00006	3/27/2019	2.53	3/27/2024	3/27/2019	102.11528	100.7248356	99.35996192	98.02001319	96.70436654	95.41241932	94.14358839	92.89730928	91.67303546
190627A00010	6/27/2019	1.97	6/27/2024	6/27/2019	101.81614	100.1792753	98.57637994	97.006459	95.46855844	93.96176105	92.48518468	91.0379805	89.61933139
200430A00017	4/30/2020	0.94	4/30/2025	4/30/2020	100.12841	97.70709778	95.35631184	93.07359986	90.85660794	88.70307821	86.61084418	84.57782648	82.6020288
190806A00026	8/6/2019	1.71	8/7/2023	8/6/2019	100.61853	99.85223011	99.09756467	98.35427085	97.62209305	96.90078329	96.1901009	95.4898123	94.79969068
190917A00028	9/17/2019	2.02	3/1/2023	9/17/2019	100.49026	100.1556684	99.82329411	99.49311866	99.1651203	98.83927759	98.51556939	98.19397482	97.87447327
211222A00029	12/22/2021	1.26	10/15/2024	12/22/2021	100.60822	98.69874926	96.83481192	95.01504772	93.2381456	91.50284222	89.80791986	88.15220447	86.53456377
160926A00004	9/26/2016	1.66	9/26/2023	9/26/2016	100.64232	99.74235517	98.85842138	97.99008908	97.13694817	96.29860282	95.47467083	94.66478308	93.86858294
181227A00019	12/28/2020	3.1	12/29/2025	12/28/2020	107.193	104.0351566	100.9875291	98.04562218	95.20515244	92.4620377	89.81238619	87.25248632	84.7787971
190820A00013	8/20/2019	1.76	8/21/2023	8/20/2019	100.60598	99.80322429	99.01323931	98.23572193	97.47037871	96.71692535	95.97508636	95.2445947	94.52519145
191009A00027	10/9/2019	1.74	10/6/2023	10/9/2019	100.63996	99.71468947	98.80636087	97.91451562	97.03870823	96.17850914	95.33350399	94.503293	93.68749029
191126A00023	11/26/2019	1.81	5/27/2025	11/26/2019	102.719	100.1876915	97.73146394	95.34763931	93.03365579	90.78705913	88.60549744	86.48671612	84.42855319
200214A00015	2/18/2020	1.76	8/6/2024	2/18/2020	101.37338	99.63973297	97.94377669	96.28438165	94.66045938	93.0709644	91.51489207	89.99127654	88.49918886

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200303A00002	3/3/2020	1.06	3/3/2023	3/3/2020	100.1975	99.85771042	99.52021913	99.18500587	98.85204763	98.52132171	98.1928057	97.86647749	97.54231526
221018A00047	10/18/2022	4.78	10/20/2025	10/18/2022	111.678	108.6395306	105.7015257	102.8601055	100.1115617	97.45234972	94.87908041	92.38851258	89.97754546
160307A00027	3/7/2016	2.71	3/6/2026	3/7/2016	106.40991	103.0820875	99.87648454	96.78799135	93.81173389	90.94306628	88.17755885	85.51098698	82.93932048
180730A00023	7/30/2018	3.13	7/30/2024	7/30/2018	103.98562	102.2425438	100.5370181	98.86789099	97.23406185	95.63447497	94.06811714	92.53401544	91.03123523
200204A00012	2/4/2020	1.98	2/4/2027	2/4/2020	105.5816	101.3928446	97.3936608	93.57443217	89.92608811	86.44006772	83.10828798	79.9231141	76.87733194
221014A00037	10/14/2022	4.86	10/15/2024	10/14/2022	107.6852	105.7045081	103.7707239	101.8824453	100.0383239	98.23706065	96.47740323	94.75814439	93.07811981
181114A00014	11/14/2018	3.17	11/14/2023	11/14/2018	102.30816	101.2685943	100.2501555	99.25220288	98.27412235	97.31532419	96.37524182	95.45333067	94.54906716
190327A00013	3/27/2019	2.53	3/27/2024	3/27/2019	102.11528	100.7248356	99.35996192	98.02001319	96.70436654	95.41241932	94.14358839	92.89730928	91.67303546
190701A00008	7/3/2019	2.1	7/3/2023	7/3/2019	100.78094	100.1087872	99.4455722	98.79112091	98.14526049	97.50782267	96.87864352	96.25756336	95.6444266
200615A00019	6/17/2020	1.34	6/16/2025	6/17/2020	101.21556	98.6582776	96.17803482	93.77203816	91.43761626	89.17221233	86.97337837	84.83876971	82.7661399
200709A00014	7/13/2020	0.57	1/20/2023	7/13/2020	100.04509	99.82125101	99.59842243	99.37659848	99.15577233	98.93593723	98.71708647	98.49921342	98.28231148
200720A00035	7/20/2020	1.81	7/20/2035	7/20/2020	106.3088	94.82279952	84.70384604	75.78133887	67.90678066	60.95081725	54.80068433	49.35800592	44.53689433
220106A00019	1/10/2022	3.17	1/7/2033	1/10/2022	119.93525	109.7849106	100.6094262	92.30913412	84.79507104	77.98777449	71.81622258	66.21689711	61.13295501
190813A00008	8/13/2019	1.88	8/13/2024	8/13/2019	101.61012	99.85606206	98.14048152	96.46224559	94.82026294	93.21348372	91.64089755	90.10153168	88.59444923
190830A00012	8/30/2019	1.76	8/30/2024	8/30/2019	101.44694	99.6501594	97.89366816	96.17632714	94.49703926	92.85474511	91.24842137	89.6770794	88.13976376
191216A00042	12/16/2019	1.95	12/16/2022	12/16/2019	100.23216	100.1046152	99.97741438	99.85055163	99.72402562	99.59783496	99.47197831	99.34645431	99.22126159
200129A00018	2/3/2020	1.74	12/15/2022	2/3/2020	100.20061	100.0758795	99.95147784	99.82740027	99.7036455	99.58021224	99.45709922	99.33430514	99.21182875
200221A00031	2/21/2020	1.69	2/21/2025	2/21/2020	101.82409	99.55986065	97.35688829	95.2131616	93.12674707	91.0957867	89.11849449	87.19315322	85.31811125
200417A00009	4/17/2020	1.35	4/16/2027	4/17/2020	103.08315	98.76163774	94.64478655	90.72187382	86.98279379	83.41801835	80.01856103	76.77594347	73.68216406
211015A00028	10/15/2021	0.73	10/16/2023	10/15/2021	99.678084	98.7312716	97.80232863	96.89075305	95.99606162	95.11778888	94.25548635	93.40872175	92.57707826
120411A00013	4/11/2012	3.59	4/15/2027	4/11/2012	113.05969	108.5193652	104.191035	100.0636686	96.12687078	92.37083796	88.78632132	85.36459259	82.09741203
160830A00061	8/30/2018	1.89	8/30/2023	8/30/2018	100.71788	99.89070032	99.0770569	98.27661789	97.48906403	96.71408629	95.95138543	95.20067167	94.46166423
181109A00027	11/13/2018	3.48	4/15/2024	11/13/2018	103.58805	102.1356283	100.7108295	99.31292884	97.94123108	96.59506447	95.27377974	93.97674915	92.70336565
190625A00017	6/25/2019	2.02	12/15/2022	6/25/2019	100.2356	100.110837	99.98639633	99.86227987	99.7384863	99.61501434	99.49186269	99.36903007	99.24651523
190925A00019	9/27/2019	1.93	9/27/2023	9/27/2019	100.80087	99.89870861	99.01263835	98.14222915	97.28706873	96.44675918	95.62091633	94.80916916	94.01115921
200108A00021	1/13/2020	1.97	1/13/2025	1/13/2020	102.32338	100.1601639	98.0530778	96.00026485	93.99994271	92.05040253	90.15000529	88.29717829	86.49041183
200922A00037	9/24/2020	2.76	9/23/2025	9/24/2020	105.51951	102.6435146	99.86112751	97.16881012	94.56317364	92.04097545	89.59911193	87.23461171	84.94462932
210429A00005	4/29/2021	2.08	4/29/2031	4/29/2021	109.20244	101.0129695	93.50395074	86.61521818	80.29221697	74.48545197	69.14999516	64.24504316	59.73351962
190501A00017	5/1/2019	2.61	5/1/2024	5/1/2019	102.3853	100.8991443	99.4420488	98.01323652	96.61195653	95.237484	93.889119	92.5661855	91.26803032
190626A00015	6/26/2019	2.15	6/26/2024	6/26/2019	101.91407	100.2824923	98.68468086	97.1196493	95.58645174	94.08417871	92.61195538	91.16893982	89.75432153
190816A00016	8/16/2019	2.2	8/16/2029	8/16/2019	109.59072	102.9165652	96.69615996	90.89628252	85.4863069	80.43798877	75.72526845	71.32409128	67.21224368
190926A00016	9/26/2019	2.28	5/24/2030	9/26/2019	110.60111	103.1872609	96.32759305	89.9777231	84.09704331	78.6483795	73.59768429	68.91375919	64.56800268
191004A00003	10/4/2019	1.89	10/5/2026	10/4/2019	104.63911	100.786103	97.09608555	93.56133189	90.17452256	86.92872081	83.8173506	80.83417597	77.97328166

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191017A00026	10/17/2019	2.3	7/17/2029	10/17/2019	110.20106	103.5816368	97.40705642	91.64504311	86.26583257	81.24196012	76.54807116	72.16074819	68.05835299
200115A00018	1/15/2020	1.9	1/16/2024	1/15/2020	101.02677	99.82926277	98.6600202	97.51805357	96.40241703	95.31220798	94.24656471	93.20466402	92.18571916
220726A00060	7/26/2022	3.32	7/26/2024	7/26/2022	104.06208	102.3328795	100.6406812	98.9843654	97.36285414	95.77511317	94.22014951	92.69700938	91.20477625
050902A00032	9/2/2005	4.69	8/22/2025	9/2/2005	111.13455	108.255588	105.4673221	102.7663839	100.1495466	97.61372244	95.15595542	92.77341499	90.46338991
180724A00075	7/24/2018	2.98	7/24/2023	7/24/2018	101.53682	100.8043144	100.0823769	99.37077585	98.66929035	97.97770564	97.29581302	96.62340965	95.96029829
200922A00043	9/24/2020	2.4	9/25/2023	9/24/2020	101.22501	100.3260854	99.44308681	98.57559619	97.72320762	96.88552926	96.06218274	95.25280257	94.45703559
210624A00022	6/24/2021	0.87	6/24/2025	6/24/2021	100.32481	97.75078522	95.25502649	92.83467472	90.48699173	88.20935805	85.99926686	83.85431824	81.77221382
220819A00037	8/19/2022	3.61	2/20/2024	8/19/2022	103.39695	102.0913932	100.8113471	99.55608111	98.32489039	97.11709717	95.93204927	94.7691189	93.62770154
150220A00022	2/20/2015	2.8	2/20/2025	2/20/2015	104.38939	102.097862	99.86808271	97.69802173	95.58572996	93.5293347	91.5270361	89.5771038	87.67787374
170908A00017	9/9/2019	2.32	9/9/2024	9/9/2019	102.52551	100.6917837	98.89968446	97.14802732	95.43566799	93.76150176	92.12446185	90.52351788	88.95767437
180629A00071	6/29/2018	3.02	6/29/2023	6/29/2018	101.38731	100.7236489	100.0686631	99.42218275	98.78404318	98.15408374	97.53214793	96.91808322	96.31174092
181016A00087	10/16/2018	3.31	10/16/2023	10/16/2018	102.17473	101.214914	100.2731351	99.34889129	98.44169567	97.55107924	96.67659007	95.81779254	94.9742666
200604A00009	6/4/2020	0.7	6/4/2025	6/4/2020	99.859861	97.34501406	94.90547795	92.53854665	90.24162935	88.01224513	85.84801749	83.74666914	81.70601718
200814A00011	8/18/2020	1.58	8/16/2030	8/18/2020	105.32264	97.90080815	91.05286426	84.73153314	78.89365632	73.49981784	68.51400209	63.90328453	59.637552
210527A00019	5/27/2021	1	5/27/2026	5/27/2021	101.3182	97.85404487	94.52572038	91.3271781	88.25267034	85.29673667	82.45418785	79.72009068	77.08975386
211222A00012	12/22/2021	0.88	7/17/2023	12/22/2021	99.933905	99.22750194	98.5310442	97.84432311	97.16713554	96.49928398	95.84057635	95.19082581	94.54985057
170427A00046	4/27/2017	3.1	4/27/2028	4/27/2017	113.31519	107.7598892	102.5160385	97.56451457	92.88746258	88.46820881	84.29117644	80.34180793	76.60649326
180130A00084	1/30/2018	2.59	1/30/2023	1/30/2018	100.5756	100.3230512	100.0717717	99.82174845	99.57297221	99.32543364	99.07912357	98.83403288	98.59015256
181203A00053	12/4/2018	3.23	12/1/2023	12/4/2018	102.36039	101.2768011	100.2161476	99.17770543	98.16078203	97.16471339	96.18886257	95.23261833	94.29539385
190530A00045	5/30/2019	2.44	5/30/2024	5/30/2019	102.24385	100.6828459	99.15319153	97.65401116	96.18445974	94.74372315	93.33101679	91.94558422	90.58669591
191121A00034	11/21/2019	2.28	11/2/2029	11/21/2019	110.27587	103.3839494	96.97358787	91.00859557	85.45567979	80.28419927	75.46594039	70.97491327	66.78716594
200225A00017	2/25/2020	1.94	2/25/2030	2/25/2020	108.03578	100.9306492	94.34332867	88.23343055	82.5639129	77.30078293	72.41283195	67.87139457	63.65012979
200306A00046	3/6/2020	1.01	3/3/2025	3/6/2020	100.26191	97.98854917	95.77748662	93.62668353	91.53418093	89.49809455	87.51661157	85.58798744	83.71054296
200326A00029	3/26/2020	1.82	3/26/2027	3/26/2020	105.12798	100.8145468	96.70234261	92.78096695	89.04061119	85.47201971	82.06645603	78.81567106	75.71187346
200611A00011	6/11/2020	1.2	6/9/2028	6/11/2020	102.98058	97.59635704	92.52388601	87.74354532	83.23704983	78.98735115	74.9785476	71.19580116	67.62526095
200722A00012	7/22/2020	0.41	7/21/2023	7/22/2020	99.650369	98.93358085	98.22705136	97.53056121	96.84389763	96.16685384	95.49922881	94.84082708	94.19145859
210209A00029	2/12/2021	0.8	12/15/2025	2/12/2021	99.910513	96.9037067	94.00187249	91.20075128	88.49628394	85.88460035	83.36200926	80.92498886	78.57017783
111024A00022	10/24/2011	3.11	10/30/2023	10/24/2011	102.15508	101.1565498	100.1775205	99.21742817	98.27572721	97.35189281	96.44541995	95.55582249	94.68263228
150601A00916	6/1/2015	7.27	4/5/2030	6/1/2015	146.31106	137.7320853	129.7568673	122.3389156	115.4355727	109.0076792	103.0192694	97.43729493	92.23137315
180103A00027	1/3/2018	2.51	1/3/2023	1/3/2018	100.40198	100.2244839	100.0476146	99.87137112	99.69575025	99.52074869	99.34636317	99.17259044	98.99942728
180814A00010	8/14/2018	3.1	8/14/2025	8/14/2018	106.60109	103.807657	101.1021096	98.48116363	95.94167618	93.48064192	91.095186	88.78255743	86.54012291
180912A00011	9/12/2018	3.41	9/11/2026	9/12/2018	110.38225	106.4815184	102.7419802	99.15613668	95.71688056	92.41746949	89.25150551	86.21291561	83.29593364
190326A00004	3/26/2019	2.58	9/26/2023	3/26/2019	101.39237	100.4899474	99.60356005	98.7327801	97.87719799	97.03641839	96.21005958	95.39775287	94.59914204

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190618A00002	6/18/2019	2.11	6/18/2025	6/18/2019	103.59073	100.9890447	98.46577372	96.01807275	93.64321703	91.33859906	89.10172264	86.93019725	84.82173282
191008A00031	10/8/2019	1.52	10/8/2024	10/8/2019	101.35361	99.44997507	97.59136312	95.77644164	94.00392418	92.27257078	90.58118588	88.92861644	87.31375016
150319A00013	3/19/2015	3.25	3/19/2030	3/19/2015	117.57971	110.0790396	103.1217602	96.66548889	90.67135487	85.1036945	79.92977154	75.11952316	70.64532914
160113A00030	1/13/2016	2.52	1/13/2025	1/13/2016	103.82626	101.6404457	99.51136436	97.43713229	95.41594669	93.44607921	91.52587224	89.65373528	87.82814166
170914A00039	9/14/2017	2.23	9/16/2024	9/14/2017	102.63279	100.7748011	98.95945415	97.18552146	95.4518185	93.75720229	92.10056954	90.48085505	88.89703012
190211A00002	2/11/2019	2.88	2/12/2024	2/11/2019	102.36911	101.0918507	99.84192641	98.61846087	97.42061416	96.24758204	95.09859403	93.97291166	92.86982681
190328A00003	3/28/2019	2.64	9/30/2024	3/28/2019	103.24264	101.345608	99.49280704	97.68294657	95.91477852	94.18709927	92.49874775	90.84860362	89.23558558
200302A00028	3/2/2020	1.25	2/26/2024	3/2/2020	100.29206	98.99257997	97.71678509	96.46406545	95.23383231	94.0255168	92.83856912	91.6724577	90.52666847
200303A00018	3/3/2020	1.27	3/3/2025	3/3/2020	100.87139	98.59077574	96.37261522	94.21486364	92.11555762	90.07280865	88.08479983	86.14978268	84.26607422
200511A00018	5/11/2020	0.98	2/2/2026	5/11/2020	100.55023	97.40873146	94.38060947	91.46110356	88.64568655	85.9300502	83.31009298	80.78190859	78.34177528
210216A00007	2/16/2021	1.3	2/16/2029	2/16/2021	104.48094	98.38966742	92.68947817	87.35332189	82.35614943	77.6747572	73.2876421	69.1748686	65.31794684
150601A00405	6/1/2015	4.63	1/17/2034	6/1/2015	136.1071	124.2079237	113.5268608	103.9302979	95.30002458	87.5313809	80.53163653	74.21857122	68.51923097
180205A00018	2/5/2018	2.66	2/3/2023	2/5/2018	100.61287	100.3492276	100.0869694	99.82608263	99.56655665	99.30838077	99.05154447	98.79603732	98.54184903
210106A00007	1/8/2021	0.49	7/25/2023	1/8/2021	99.634694	98.90813235	98.19210727	97.48639072	96.79076145	96.10500454	95.42891112	94.76227816	94.10490832
220531A00020	5/31/2022	2.86	5/31/2024	5/31/2022	102.91699	101.3478164	99.81017185	98.30317579	96.82597718	95.37775617	93.95772272	92.56511516	91.19919897
220823A00060	8/23/2022	3.5	8/23/2024	8/23/2022	104.83212	103.0175934	101.243342	99.50821205	97.81108742	96.1508922	94.52658879	92.93717625	91.38168871
190828A00015	8/28/2019	2.04	8/28/2029	8/28/2019	108.53269	101.8637011	95.65077337	89.86038777	84.46165146	79.42607729	74.72738525	70.34132118	66.24549131
200302A00008	3/2/2020	1.2	3/9/2023	3/2/2020	100.21415	99.85825843	99.50490204	99.15404886	98.80567228	98.45974608	98.1162444	97.77514175	97.43641299
200722A00010	7/22/2020	0.66	7/22/2024	7/22/2020	99.437452	97.75980587	96.11802851	94.51103452	92.93778261	91.39727342	89.88854728	88.41068225	86.96279224
200925A00003	9/25/2020	0.59	9/25/2024	9/25/2020	99.296001	97.45105103	95.64900605	93.88861754	92.1686816	90.48803684	88.84556263	87.24017736	85.67083685
210514A00033	5/18/2021	2.8	5/18/2028	5/18/2021	111.77999	106.211391	100.9583552	96.0013164	91.32202501	86.90345001	82.72969118	78.7858983	75.0581965
170427A00047	4/27/2017	3.18	4/27/2029	4/27/2017	115.66536	109.078572	102.9186644	97.15564077	91.76176022	86.71135998	81.98068945	77.5477584	73.39219803
180530A00030	5/30/2018	3.68	5/30/2034	5/30/2018	127.16266	115.4151887	104.9187764	95.53151243	87.12834084	79.59897949	72.8461037	66.78376161	61.33599049
180823A00013	8/23/2018	2.97	8/23/2023	8/23/2018	101.59162	100.779213	99.97979332	99.19304927	98.41868089	97.65639766	96.90591809	96.1669694	95.43928715
200304A00010	3/4/2020	1.2	3/4/2027	3/4/2020	102.92363	98.69683279	94.66582994	90.82059291	87.1516571	83.65008641	80.30744103	77.11574751	74.06747064
190529A00011	5/29/2019	2.36	5/30/2023	5/29/2019	100.86906	100.2882984	99.71420941	99.14667544	98.58558474	98.03082813	97.48229888	96.93989266	96.40350744
190814A00009	8/14/2019	1.84	8/14/2024	8/14/2019	101.54164	99.78561045	98.06815247	96.38813462	94.74446558	93.13609529	91.56201294	90.02124516	88.51285431
190930A00071	9/30/2019	2.05	9/29/2025	9/30/2019	103.48666	100.6244585	97.85615127	95.17816018	92.58706594	90.07959756	87.65262514	85.30315288	83.02831265
210603A00015	6/7/2021	2.71	6/7/2028	6/7/2021	111.3753	105.765407	100.4761799	95.48757838	90.7809171	86.33876881	82.14487301	78.18405175	74.44213199
180102A00020	1/2/2018	2.5	1/3/2023	1/2/2018	100.40021	100.2227089	100.0458419	99.86960076	99.69398223	99.518983	99.3445998	99.17082939	98.99766854
200429A00035	5/1/2020	1.41	4/30/2024	5/1/2020	100.57137	99.10205427	97.66147213	96.24885803	94.86347074	93.50459469	92.1715389	90.86363585	89.58024058
170915A00001	9/15/2017	2.43	9/16/2024	9/15/2017	102.76677	100.9119501	99.09961476	97.32854689	95.59756822	93.90554156	92.25136917	90.63399112	89.05238372
171103A00017	11/3/2017	2.09	11/3/2022	11/3/2017	100.0188	100.0104693	100.0021432	99.99382463	99.98551352	99.97720986	99.96891366	99.9606249	99.95234356

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
181128A00031	11/28/2018	3.29	11/28/2023	11/28/2018	102.40704	101.3311823	100.2779275	99.2465687	98.23642785	97.24685486	96.27722594	95.32694227	94.39542883
190523A00017	5/23/2019	2.51	3/15/2024	5/23/2019	102.04302	100.6843525	99.35016908	98.03986561	96.75285655	95.48857504	94.24647215	93.0260162	91.8266921
190820A00020	8/20/2019	1.76	8/20/2024	8/20/2019	101.41629	99.64580322	97.91451347	96.22128641	94.56502932	92.94468934	91.35925169	89.80773796	88.2892045
190923A00020	9/23/2019	2.05	9/24/2029	9/23/2019	109.61993	102.8067676	96.46483393	90.55911779	85.05737501	79.92989894	75.14930892	70.69035728	66.52975332
200227A00052	2/27/2020	1.41	2/27/2023	2/27/2020	100.2839	99.95520034	99.62865169	99.30422852	98.98191021	98.66167636	98.34350687	98.02738189	97.71328179
200403A00006	4/3/2020	1.05	4/3/2025	4/3/2020	100.37772	98.02394117	95.73674436	93.51387929	91.35318705	89.25259397	87.21010766	85.22381338	83.29187048
171205A00014	12/5/2017	2.49	12/5/2022	12/5/2017	100.239	100.1418967	100.0449911	99.94828036	99.85176386	99.75544098	99.65931114	99.56337374	99.46762819
190213A00023	2/13/2019	2.93	2/13/2024	2/13/2019	102.44071	101.1603385	99.90706472	98.68003172	97.47841645	96.30143051	95.14831825	94.01835504	92.91084572
190214A00008	2/14/2019	2.64	2/14/2023	2/14/2019	100.65906	100.3650214	100.0727134	99.78211686	99.49321676	99.20599817	98.92044634	98.63654674	98.35428496
200611A00013	6/11/2020	0.59	6/12/2023	6/11/2020	99.804095	99.19194833	98.58728176	97.98995911	97.39984715	96.81681588	96.24073841	95.67149086	95.10895229
150317A00013	3/17/2015	2.58	3/17/2025	3/17/2015	104.32068	101.9562725	99.65740135	97.42189649	95.24766799	93.13270702	91.07508218	89.0729361	87.12448209
180828A00032	8/28/2018	3.49	8/29/2033	8/28/2018	125.58404	114.4954739	104.5267854	95.55758846	87.4810589	80.20234312	73.63716075	67.7105766	62.35592075
180910A00028	9/10/2018	3.56	9/9/2033	9/10/2018	126.36923	115.2127925	105.1847597	96.16360047	88.04150106	80.7227529	74.12233699	68.16467993	62.78256019
190603A00003	6/3/2019	2.05	6/3/2024	6/3/2019	101.84495	100.2729814	98.73278474	97.22346127	95.74414836	94.2940153	92.87226181	91.47811657	90.11083597
191105A00018	11/5/2019	1.78	11/6/2023	11/5/2019	100.83242	99.8224007	98.8325293	97.86220798	96.91086207	95.97793924	95.06290844	94.16525881	93.28449882
200302A00031	3/2/2020	1.02	11/18/2022	3/2/2020	100.05931	100.0093614	99.95947853	99.90966123	99.85990935	99.81022275	99.76060132	99.7110449	99.66155338
200312A00017	3/16/2020	1.09	2/15/2023	3/16/2020	100.17388	99.87835091	99.58457317	99.29252881	99.00220245	98.71357893	98.42664324	98.14138057	97.85777627
200429A00018	5/4/2020	0.73	4/17/2023	5/4/2020	99.988092	99.5265485	99.06925989	98.61616759	98.16721399	97.72234247	97.2814975	96.8446245	96.4116699
220726A00059	7/26/2022	3.34	1/26/2024	7/26/2022	102.84829	101.6124601	100.406347	99.22888461	98.07906017	96.95590824	95.85850785	94.78598006	93.73748552
170120A00008	1/20/2017	3.63	1/20/2034	1/20/2017	126.0509	114.6791894	104.4870224	95.34404035	87.13499092	79.75790097	73.1224821	67.14873495	61.76572674
180914A00029	9/14/2018	3.48	9/14/2028	9/14/2018	116.27997	110.271461	104.6186279	99.29851101	94.28974587	89.57244526	85.12809011	80.93942878	76.99038431
181010A00020	10/10/2018	3.27	12/1/2022	10/10/2018	100.28403	100.1979646	100.1120502	100.0262832	99.94066317	99.85518972	99.76986251	99.68468119	99.59964538
190620A00056	6/25/2019	2.07	1/17/2023	6/25/2019	100.3721	100.1560155	99.94087059	99.72666189	99.51338324	99.30102855	99.08959176	98.87906688	98.66944797
200228A00067	2/28/2020	1.4	2/28/2025	2/28/2020	101.17122	98.89470933	96.68032123	94.52603132	92.42989264	90.39003222	88.40464787	86.47200504	84.59043396
200506A00005	5/6/2020	0.97	5/6/2025	5/6/2020	100.2078	97.77011379	95.40373398	93.10616569	90.87501732	88.70799545	86.60290009	84.55762032	82.57012999
200922A00041	9/24/2020	2.68	9/23/2024	9/24/2020	103.27906	101.40046	99.56526809	97.77222528	96.02011728	94.30777266	92.63406101	90.99789121	89.39820984
221028A00056	10/28/2022	4.77	10/28/2024	10/28/2022	107.6517	105.6369099	103.6706281	101.7513861	99.87776659	98.04840505	96.261987	94.51724599	92.81296143
181109A00029	11/9/2018	3.72	11/9/2026	11/9/2018	112.13856	108.0454936	104.1275519	100.3762955	96.78373371	93.34230232	90.0448385	86.88455727	83.85502943
190301A00012	3/1/2019	3.41	3/1/2029	3/1/2019	116.84367	110.3685877	104.303186	98.61933375	93.29097032	88.29394283	83.60585733	79.20594245	75.07492418
190314A00027	3/22/2019	2.92	3/21/2025	3/22/2019	104.84304	102.4683215	100.1595346	97.91448697	95.7310719	93.60726473	91.54111899	89.53076296	87.57439636
190430A00001	4/30/2019	2.47	5/2/2024	4/30/2019	102.35844	100.8668772	99.40455036	97.97067801	96.56450248	95.18529248	93.83234202	92.50496924	91.20251545
200224A00007	2/24/2020	1.59	2/24/2025	2/24/2020	101.60211	99.33191369	97.12335966	94.97443013	92.88318548	90.84776101	88.86636348	86.93726796	85.05881476
200228A00020	2/28/2020	1.32	2/24/2023	2/28/2020	100.25191	99.93150587	99.61314873	99.29681719	98.98249197	98.67015405	98.35978464	98.05136519	97.74487738

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200305A00008	3/10/2020	1.01	6/19/2023	3/10/2020	100.05678	99.42493384	98.80104184	98.18495331	97.57652248	96.97560723	96.3820689	95.79577226	95.21658536
200311A00006	3/13/2020	1.12	3/10/2025	3/13/2020	100.52589	98.23156404	96.00054882	93.83075638	91.72018219	89.66689874	87.66905218	85.72485902	83.83260308
200811A00003	8/11/2020	0.57	8/11/2025	8/11/2020	99.530976	96.84485311	94.24378057	91.72455952	89.28413318	86.91957965	84.62810491	82.40703627	80.25381619
220118A00008	1/18/2022	1.36	1/18/2024	1/18/2022	100.36998	99.17144189	98.00135414	96.85870935	95.74255128	94.65196769	93.58608779	92.54407992	91.52514937
150819A00012	8/19/2015	3.04	8/19/2025	8/19/2015	106.09815	103.306903	100.6037364	97.98536545	95.44865055	92.99058807	90.60830331	88.29904414	86.06017494
170111A00011	1/11/2017	3.24	1/11/2029	1/11/2017	115.51049	109.2110325	103.3029429	97.75973533	92.55685924	87.67154535	83.08266687	78.77061236	74.71716912
180222A00027	2/22/2018	3.24	2/22/2028	2/22/2018	114.464	109.0249332	103.8819214	99.01728084	94.41447097	90.05801801	85.93344061	82.02718125	78.32654267
190426A00016	5/1/2019	2.58	4/14/2023	5/1/2019	100.83958	100.3838702	99.93228245	99.48476109	99.04125123	98.601699	98.16605148	97.7342567	97.30626359
190930A00077	9/30/2019	2.23	9/28/2029	9/30/2019	109.87381	103.0816827	96.75847287	90.86937596	85.38233577	80.26781704	75.49859542	71.04956593	66.89756808
200511A00021	5/11/2020	1.53	2/1/2029	5/11/2020	105.01905	98.98576776	93.33596514	88.04328878	83.08333377	78.43348841	74.07279296	69.98181024	66.14250711
220826A00033	8/26/2022	3.73	8/26/2025	8/26/2022	108.09026	105.2523159	102.5042313	99.8426741	97.26445231	94.76650983	92.34592006	89.99987955	87.72570211
150601A00664	6/1/2015	3.78	1/16/2032	6/1/2015	123.95963	114.5008545	105.8686902	97.98575489	90.78231851	84.19550631	78.16859104	72.65036163	67.59455981
150821A00018	8/21/2015	2.6	8/21/2024	8/21/2015	103.1795	101.385732	99.63173534	97.91636236	96.23850555	94.59709769	92.99111002	91.41955053	89.88146234
170322A00022	3/22/2017	3.89	9/23/2041	3/22/2017	136.90272	118.611432	103.2406582	90.29344147	79.36066755	70.10508437	62.2483004	55.56019476	49.85028132
190606A00023	6/6/2019	2.23	6/6/2024	6/6/2019	101.94093	100.3635337	98.81806772	97.30362626	95.8193397	94.36437074	92.93791285	91.53918882	90.16744942
150601A00830	6/1/2015	6.743	7/31/2025	6/1/2015	116.27204	113.3812266	110.5792799	107.862872	105.2288238	102.6740988	100.1957954	97.79113975	95.45747922
170313A00033	3/13/2017	3.31	3/15/2027	3/13/2017	111.52279	107.1001536	102.8807427	98.85416417	95.01061045	91.34082219	87.8360548	84.48804728	81.28899306
170322A00023	3/22/2017	3.82	9/22/2039	3/22/2017	134.8723	118.2263465	104.0085825	91.8420563	81.4106572	72.44899436	64.73400183	58.07797079	52.32276036
170728A00031	7/28/2017	2.27	1/27/2023	7/28/2017	100.4555	100.2117137	99.96911692	99.72769618	99.48744292	99.2483487	99.01040517	98.77360405	98.53793714
180705A00062	7/5/2018	3.04	7/6/2023	7/5/2018	101.43269	100.7499673	100.0764325	99.4118983	98.75618513	98.10911807	97.4705268	96.84024548	96.21811256
181211A00018	12/11/2018	3.14	12/11/2023	12/11/2018	102.32301	101.2129415	100.1269547	99.06427377	98.02415396	97.00588174	96.00877351	95.03217389	94.07545437
190724A00024	7/24/2019	2.49	7/24/2029	7/24/2019	112.45122	105.7023059	99.4079357	93.53502975	88.05309054	82.93398517	78.15174959	73.68241021	69.503821
191105A00014	11/5/2019	1.96	11/6/2023	11/5/2019	100.90624	99.89741348	98.90868109	97.93944982	96.98914713	96.0572227	95.14314737	94.24641211	93.36652708
200228A00026	2/28/2020	2.14	2/28/2035	2/28/2020	110.23343	98.81450172	88.71082952	79.76308118	71.83199113	64.79574555	58.54771852	52.99451139	48.05425348
200506A00010	5/6/2020	0.94	5/6/2026	5/6/2020	101.05553	97.64969369	94.37585865	91.22821729	88.20124834	85.28970257	82.48858777	79.79315474	77.19888398
170613A00032	6/13/2017	2.45	6/13/2025	6/13/2017	104.4609	101.8611438	99.33935292	96.89271225	94.5185253	92.214211	89.97729783	87.80541832	85.69630393
171026A00009	10/26/2017	2.75	10/27/2025	10/26/2017	105.68771	102.720726	99.85317613	97.0811795	94.4010325	91.80919645	89.30228923	86.87707745	84.53046895
180620A00014	6/20/2018	3.4	6/20/2028	6/20/2018	115.29613	109.543117	104.1189917	99.00314476	94.17636721	89.62074842	85.31958142	81.25727565	77.41927646
190214A00006	2/14/2019	2.67	2/14/2024	2/14/2019	102.26407	100.9798657	99.72258468	98.49138322	97.28545258	96.10401765	94.94633518	93.81169216	92.69940425
150601A00668	6/1/2015	3.89	1/16/2037	6/1/2015	132.99797	118.6410412	106.096296	95.12021499	85.50341197	77.06567974	69.65177904	63.12785435	57.37838058
180111A00007	1/11/2018	2.66	1/14/2025	1/11/2018	104.14179	101.9497981	99.8147315	97.73470186	95.70789855	93.73258579	91.80709892	89.92984079	88.09927838
180124A00020	1/24/2018	2.53	1/24/2023	1/24/2018	100.53029	100.2943786	100.0595821	99.82589323	99.59330404	99.36180677	99.13139369	98.90205717	98.67378964
180410A00017	4/10/2018	3.02	10/10/2023	4/10/2018	101.8637	100.9215296	99.99677811	99.08896761	98.19763539	97.32233544	96.46263772	95.61812747	94.78840452

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190409A00019	4/9/2019	2.91	4/9/2029	4/9/2019	114.80206	108.2539877	102.128929	96.39728961	91.03169133	86.00679638	81.29914568	76.88701046	72.75025636
190620A00027	6/20/2019	2.14	6/20/2024	6/20/2019	101.85554	100.2409755	98.65959685	97.11044907	95.59260998	94.10519254	92.64734315	91.21824001	89.81709164
200127A00016	1/27/2020	1.81	1/27/2025	1/27/2020	102.01003	99.8141629	97.67606589	95.59379619	93.56549253	91.58937188	89.66372539	87.78691455	85.95736768
200302A00033	3/2/2020	1.31	3/3/2025	3/2/2020	100.96515	98.68342598	96.46417347	94.30535289	92.20500019	90.16122621	88.17221341	86.23621272	84.35154057
200828A00002	8/28/2020	0.73	8/28/2026	8/28/2020	100.52585	96.83725234	93.30206285	89.91314249	86.66372225	83.54738075	80.55802447	77.68986938	74.93742358
210709A00002	7/9/2021	1.36	7/9/2029	7/9/2021	104.89779	98.43385183	92.40768696	86.78742801	81.54368893	76.64935755	72.0794081	67.81073011	63.82197229
210830A00011	8/30/2021	0.53	8/30/2023	8/30/2021	99.577579	98.75561064	97.94711704	97.151769	96.36924842	95.59924733	94.84146758	94.0956204	93.36142604
220225A00013	2/25/2022	1.92	2/23/2024	2/25/2022	101.17234	99.87452917	98.60123664	97.35179159	96.12554931	94.92188837	93.7402096	92.5799351	91.44050724
180116A00015	1/16/2018	3.06	1/18/2028	1/16/2018	112.51788	107.2508782	102.2658281	97.54608642	93.0760831	88.84124744	84.82793806	81.02337846	77.41559729
191104A00024	11/4/2019	2.26	8/3/2029	11/4/2019	109.96842	103.3143723	97.11034519	91.32349781	85.92355829	80.88260618	76.17487764	71.7765878	67.66576869
140922A00026	9/22/2014	3.02	9/30/2024	9/22/2014	104.22457	102.3132248	100.4464869	98.62304814	96.84164814	95.10107161	93.40014629	91.73774113	90.11276458
181130A00037	11/30/2018	3.05	11/30/2023	11/30/2018	102.27649	101.1943191	100.135023	99.09788406	98.08221246	97.08734667	96.11265215	95.1575199	94.22136522
190918A00007	9/20/2019	1.95	12/15/2022	9/20/2019	100.22685	100.1020976	99.9776667	99.85355997	99.7297761	99.60631381	99.48317182	99.36034884	99.23784361
200228A00016	2/28/2020	1.35	2/22/2024	2/28/2020	100.41501	99.12505418	97.8597732	96.61847747	95.40050698	94.20522606	93.03202223	91.88030515	90.74950558
200818A00010	8/18/2020	1.88	8/20/2035	8/18/2020	107.14906	95.54861774	85.33500849	76.33434302	68.39536132	61.38638908	55.19271556	49.71433366	44.86399052
140423A00036	4/23/2014	4.03	4/23/2029	4/23/2014	121.09618	114.3482618	108.0338329	102.1225957	96.5865214	91.39967232	86.53803582	81.97937189	77.70307361
150601A00512	6/1/2015	3.79	7/16/2029	6/1/2015	119.71781	112.7899175	106.3214166	100.2792192	94.6327927	89.35395273	84.41666998	79.79689438	75.47239425
190528A00007	5/28/2019	2.44	11/15/2023	5/28/2019	101.43349	100.3978083	99.38323623	98.38912837	97.41487005	96.45987095	95.52356399	94.60540415	93.70486743
190829A00045	8/29/2019	1.9	8/28/2026	8/29/2019	104.49941	100.7485369	97.15246912	93.70403367	90.39642899	87.2232016	84.17822653	81.25568883	78.4500663
200722A00011	7/22/2020	0.59	7/24/2023	7/22/2020	99.710785	98.98658178	98.27284199	97.56934045	96.87585818	96.19218243	95.51810642	94.85342916	94.19795524
220421A00015	4/21/2022	3.12	9/16/2024	4/21/2022	104.06865	102.2012248	100.3765252	98.59332408	96.85043684	95.14672007	93.48107009	91.85242125	90.25974434
170822A00019	8/22/2017	2.44	8/22/2024	8/22/2017	102.65907	100.8717626	99.12408465	97.41489423	95.74309203	94.10761843	92.5074517	90.94160632	89.40913144
170919A00073	9/19/2017	2.28	9/19/2024	9/19/2017	102.74247	100.8753426	99.05123219	97.26889466	95.52713072	93.82478318	92.16073524	90.53390882	88.94326292
180529A00066	5/29/2018	2.99	5/26/2023	5/29/2018	101.2194	100.6483236	100.083691	99.52538925	98.97331219	98.42735614	97.88741966	97.35340355	96.82521077
180813A00013	8/13/2018	2.99	12/5/2022	8/13/2018	100.28761	100.1904604	100.0935086	99.99675175	99.90018918	99.80382033	99.70764459	99.61166138	99.51587012
180830A00039	8/30/2018	3.03	8/30/2023	8/30/2018	101.67372	100.8421726	100.0242124	99.21950592	98.427733	97.64858365	96.88175775	96.12696464	95.38392271
181217A00010	12/17/2018	3.11	12/15/2023	12/17/2018	102.31348	101.1927922	100.0966571	99.02426936	97.97486287	96.94770408	95.9420904	94.95734856	93.99283314
190524A00032	5/24/2019	2.45	5/24/2023	5/24/2019	100.90348	100.3388584	99.78055273	99.22845373	98.68245828	98.14246552	97.60837678	97.08009557	96.55752748
200130A00012	1/30/2020	1.72	1/30/2023	1/30/2020	100.32856	100.0767239	99.82615184	99.57682963	99.32874796	99.08189766	98.83626962	98.59185483	98.34864436
200330A00041	4/1/2020	1.09	4/1/2025	4/1/2020	100.47272	98.1230187	95.83962933	93.62031745	91.46293768	89.36542908	87.32581136	85.34218115	83.41270861
201130A00005	11/30/2020	0.28	11/30/2022	11/30/2020	100.03717	99.95398998	99.87094232	99.78803135	99.70525675	99.6226182	99.54011538	99.45774796	99.37551562
220711A00020	7/11/2022	3.25	1/11/2024	7/11/2022	102.77442	101.5769531	100.407397	99.26478319	98.14818796	97.05672924	95.98956453	94.9458886	93.92493149
170803A00032	8/3/2017	2.12	8/3/2023	8/3/2017	100.92661	100.1697288	99.42416995	98.68967922	97.96601158	97.25292915	96.55020098	95.85760282	95.17491681

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180518A00014	5/18/2018	3.17	5/18/2023	5/18/2018	101.28247	100.7329226	100.189339	99.65162695	99.11969147	98.59343971	98.07278076	97.55762565	97.04788729
190110A00012	1/10/2019	2.97	1/18/2024	1/10/2019	102.34317	101.131872	99.94923187	98.79423921	97.66593224	96.56339335	95.48574662	94.43215543	93.40182032
190809A00020	8/9/2019	2.44	8/9/2034	8/9/2019	115.12012	103.7741182	93.67912872	84.68957526	76.67754608	69.5305695	63.14967905	57.44772968	52.34793132
121101A00011	11/1/2012	2.03	11/1/2022	11/1/2012	100.0061	100.0033232	100.0005478	99.99777467	99.99500392	99.99223552	99.98946944	99.9867057	99.98394428
150610A00009	6/10/2015	3.03	6/10/2025	6/10/2015	105.96275	103.3512433	100.8177281	98.35939751	95.97356304	93.65765096	91.40919634	89.22583767	87.10531177
150721A00027	7/21/2015	3.74	7/22/2030	7/21/2015	121.76845	113.7909043	106.4114801	99.58180722	93.25767798	87.39867149	81.96781003	76.9312483	72.25799224
170612A00039	6/12/2017	2.29	6/12/2024	6/12/2017	102.27455	100.674524	99.10714375	97.57147973	96.06663381	94.5917416	93.1459709	91.72852012	90.33861693
180130A00085	1/30/2018	2.79	1/30/2025	1/30/2018	104.52452	102.2861774	100.1068418	97.98451706	95.91729592	93.90335175	91.94093423	90.02836542	88.16403612
181005A00017	10/5/2018	3.27	4/11/2023	10/5/2018	101.13909	100.6907603	100.246412	99.8059909	99.36944505	98.93672332	98.5077755	98.08255228	97.66100517
190731A00004	7/31/2019	2.18	7/31/2024	7/31/2019	102.0936	100.3690624	98.68170387	97.03038936	95.41402836	93.83157478	92.28202463	90.76441388	89.27781646
200131A00038	1/31/2020	1.73	1/30/2025	1/31/2020	101.83811	99.63647191	97.49293205	95.40553129	93.37239193	91.39171551	89.46177863	87.58092915	85.74758251
200220A00015	2/20/2020	1.57	2/20/2025	2/20/2020	101.84071	99.57306811	97.36682474	95.21995184	93.13050642	91.09662181	89.11650409	87.18842876	85.31073755
200922A00036	9/24/2020	1.55	9/23/2025	9/24/2020	102.01339	99.18856656	96.45610599	93.8125045	91.25441243	88.77862474	86.38207387	84.0618231	81.81506022
050923A00096	9/23/2005	4.86	9/22/2025	9/23/2005	111.98493	109.0084226	106.1281414	103.3404499	100.6418732	98.02908622	95.49890639	93.04828661	90.67430883
170417A00068	4/17/2019	2.59	4/17/2024	4/17/2019	102.29188	100.8439905	99.42374671	98.03042838	96.66333734	95.32179906	94.00516164	92.71279491	91.4440895
180913A00029	9/13/2018	3.11	9/13/2023	9/13/2018	101.8109	100.9411981	100.0863506	99.245981	98.41972341	97.60722423	96.80814159	96.02214488	95.24891427
181109A00028	11/9/2018	3.72	11/9/2026	11/9/2018	112.13856	108.0454936	104.1275519	100.3762955	96.78373371	93.34230232	90.0448385	86.88455727	83.85502943
190215A00004	2/15/2019	2.84	2/15/2023	2/15/2019	100.69367	100.3971373	100.1023591	99.80931887	99.51800107	99.22839053	98.94047222	98.65423129	98.36965306
191015A00029	10/15/2019	1.91	10/15/2024	10/15/2019	101.88601	99.96367794	98.08712936	96.2549945	94.46595558	92.71874277	91.01213214	89.34494362	87.71603916
191220A00001	12/20/2019	2.62	12/19/2031	12/20/2019	113.98827	105.0364478	96.87191635	89.42096629	82.61715606	76.40056017	70.71709915	65.51794167	60.75897053
200110A00014	1/10/2020	1.73	1/10/2023	1/10/2020	100.3022	100.1052987	99.90917818	99.71383819	99.519274	99.32548095	99.13245438	98.94018969	98.74868231
160606A00004	6/6/2016	2.43	6/8/2026	6/6/2016	106.02903	102.4610078	99.03270946	95.73789295	92.57063196	89.5252979	86.5965431	83.779285	81.06869144
180823A00035	8/23/2018	3.05	8/22/2025	8/23/2018	106.51603	103.7026555	100.9784056	98.3399616	95.78414534	93.30791556	90.9083611	88.58269444	86.32824569
190227A00005	2/27/2019	2.87	2/27/2024	2/27/2019	102.45722	101.1399935	99.84646801	98.57604366	97.32814279	96.10220671	94.89769501	93.71408478	92.55086991
190401A00010	4/1/2019	2.62	4/1/2024	4/1/2019	102.26299	100.8583555	99.47976664	98.12656654	96.79811552	95.4937949	94.21300617	92.95517014	91.7197262
190625A00023	6/25/2019	2.47	6/25/2027	6/25/2019	108.5019	103.8744257	99.47229031	95.28330496	91.29601068	87.49962748	83.88401017	80.43960731	77.15742317
200630A00004	6/30/2020	0.66	7/1/2024	6/30/2020	99.436844	97.81328887	96.22358112	94.66672697	93.14177116	91.6477955	90.18391709	88.74928653	87.34308639
150407A00010	4/7/2015	2.21	4/10/2023	4/7/2015	100.70014	100.2552419	99.81427917	99.37719818	98.94394768	98.51447735	98.08873776	97.66668033	97.24825734
180403A00005	4/3/2018	2.72	4/3/2023	4/3/2018	100.89888	100.472592	100.0499007	99.63076276	99.21513358	98.8029692	98.39422638	97.98886265	97.5868362
180813A00059	8/13/2018	3.01	8/11/2023	8/13/2018	101.56857	100.7884829	100.0203705	99.26396284	98.51899363	97.78520458	97.06234514	96.35017223	95.64844991
190701A00009	7/3/2019	2.14	7/2/2024	7/3/2019	101.92264	100.274962	98.66161098	97.08158141	95.53390364	94.01764576	92.53191171	91.0758395	89.64859957
190826A00056	8/26/2019	1.72	8/26/2024	8/26/2019	101.3615	99.57592404	97.83018428	96.12314556	94.45371304	92.82083039	91.22347818	89.66067229	88.13146247
200709A00004	7/10/2020	1.4	7/10/2025	7/10/2020	101.4235	98.80072123	96.25846967	93.79376067	91.40374493	89.08569858	86.83701665	84.65520692	82.53788415

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220601A00038	6/3/2022	3.69	5/28/2032	6/3/2022	124.16088	114.3582798	105.4423233	97.32724501	89.93601959	83.19942948	77.05523611	71.44744274	66.32563856
180104A00013	1/4/2018	2.39	1/4/2023	1/4/2018	100.40455	100.2240763	100.0442603	99.86509439	99.68657518	99.50869908	99.33146261	99.15486229	98.97889468
190626A00004	6/26/2019	2.15	6/26/2024	6/26/2019	101.91407	100.2824923	98.68468086	97.1196493	95.58645174	94.08417871	92.61195538	91.16893982	89.75432153
200225A00018	2/25/2020	1.94	2/25/2030	2/25/2020	108.03578	100.9306492	94.34332867	88.23343055	82.5639129	77.30078293	72.41283195	67.87139457	63.65012979
220421A00013	4/21/2022	3.33	9/15/2026	4/21/2022	110.10861	106.2023169	102.4579274	98.86789044	95.42504861	92.12261306	88.95414261	85.91352417	82.99495429
160714A00029	8/10/2016	2.27	8/10/2026	8/10/2016	105.81036	102.0812298	98.50398183	95.07159297	91.77740662	88.61511128	85.5787204	82.66255364	79.86121927
171018A00011	10/18/2017	2.68	10/18/2027	10/18/2017	110.79438	105.7902577	101.0442988	96.54183486	92.26910509	88.21319615	84.36198562	80.70408958	77.22881389
180629A00008	6/29/2018	3.02	6/29/2023	6/29/2018	101.38731	100.7236489	100.0686631	99.42218275	98.78404318	98.15408374	97.53214793	96.91808322	96.31174092
180910A00032	9/10/2018	3.22	9/10/2024	9/10/2018	104.2137	102.3610884	100.5505229	98.78080685	97.05078321	95.3593349	93.70538329	92.08788661	90.50583846
190131A00036	1/31/2019	2.69	7/31/2023	1/31/2019	101.35023	100.5996388	99.86014424	99.13149931	98.4134666	97.70581562	97.0083225	96.32076976	95.64294609
200115A00015	1/17/2020	1.88	1/17/2023	1/17/2020	100.33095	100.1149273	99.89984571	99.6857001	99.47248433	99.26019229	99.04881795	98.8383553	98.62879841
200827A00007	8/27/2020	0.77	8/27/2025	8/27/2020	99.73809	97.0164271	94.38193072	91.83135269	89.36158454	86.96965028	84.65269994	82.40800352	80.23294522
171219A00025	12/19/2017	2.33	12/19/2022	12/19/2017	100.31088	100.1748053	100.0391111	99.9037994	99.7688687	99.6343173	99.50014358	99.36634591	99.23292267
180918A00023	9/18/2018	3.17	9/18/2023	9/18/2018	101.88942	101.0059535	100.1378049	99.28458044	98.44589736	97.6213859	96.81068878	96.0134606	95.22936744
191206A00019	12/6/2019	1.96	11/15/2023	12/6/2019	100.92947	99.8966201	98.88483636	97.89347753	96.92192985	95.96960389	95.03593344	94.12037432	93.22240335
200210A00009	2/10/2020	1.57	2/10/2025	2/10/2020	101.80498	99.56652371	97.38799306	95.26738528	93.20278236	91.19234455	89.23430645	87.32697336	85.46871788
200227A00005	2/27/2020	1.43	2/27/2024	2/27/2020	100.53468	99.23090397	97.95060313	96.69318203	95.458069	94.24471117	93.05257374	91.88113916	90.72990655
200309A00046	3/9/2020	0.78	3/11/2025	3/9/2020	100.02419	97.72708786	95.49359578	93.32160778	91.20910418	89.15414321	87.15485747	85.2094507	83.31619459
200417A00016	4/21/2020	2.18	4/21/2025	4/21/2020	103.1943	100.7580296	98.39178084	96.09314793	93.85981894	91.68957519	89.58028687	87.52990887	85.53647689
200511A00019	5/11/2020	1.18	2/1/2027	5/11/2020	102.17439	98.06608569	94.14425528	90.39942048	86.82264317	83.40548893	80.13999552	77.01864341	74.03432844
200615A00005	6/15/2020	0.61	6/15/2023	6/15/2020	99.809759	99.18953866	98.57699752	97.97199319	97.37438718	96.78404437	96.20083292	95.62462417	95.05529252
200922A00040	9/24/2020	2	9/23/2024	9/24/2020	101.98307	100.1171353	98.29436728	96.51351509	94.77337098	93.07276973	91.41058693	89.78573726	88.19717284
220624A00016	6/24/2022	3.34	6/24/2026	6/24/2022	109.93042	106.2356475	102.6865441	99.27653551	95.99938849	92.84918681	89.82031293	86.90743105	84.10547118
180514A00035	5/14/2018	3.07	5/14/2024	5/14/2018	103.34586	101.8146819	100.3138337	98.84248601	97.39983843	95.98511919	94.59758376	93.23651369	91.90121543
180522A00019	5/22/2018	3.16	5/22/2023	5/22/2018	101.29695	100.7364827	100.1822215	99.63406163	99.0919026	98.55564613	98.02519609	97.50045843	96.9813411
190103A00010	1/3/2019	2.7	1/3/2024	1/3/2019	102.07045	100.8987538	99.75390169	98.63498315	97.5411244	96.4714905	95.42528322	94.40173909	93.40012748
190514A00073	5/14/2019	2.53	5/14/2024	5/14/2019	102.3111	100.7915676	99.30210183	97.84188205	96.4101159	95.00603925	93.62891491	92.27803145	90.95270205
200210A00021	2/10/2020	1.76	2/10/2025	2/10/2020	101.94557	99.71143523	97.53698606	95.4202361	93.359278	91.35228205	89.39749234	87.4932232	85.63785576
160705A00005	7/5/2016	1.49	7/5/2023	7/5/2016	100.42827	99.75130659	99.08343647	98.42448016	97.7742601	97.13260343	96.49934182	95.87431134	95.25735229
180802A00006	8/2/2018	2.99	8/2/2023	8/2/2018	101.5868	100.8298333	100.0841366	99.34945767	98.62555367	97.9121888	97.20913409	96.51616719	95.83307208
190926A00015	9/26/2019	2.32	11/26/2030	9/26/2019	111.08834	103.1987674	95.93357417	89.23998156	83.06992764	77.37962663	72.12916816	67.28215593	62.80538179
191002A00016	10/2/2019	1.79	10/2/2023	10/2/2019	100.68023	99.76538327	98.86709096	97.98490838	97.11840535	96.2671669	95.43079257	94.60889579	93.80110331
210216A00008	2/16/2021	0.71	2/17/2026	2/16/2021	100.12139	96.9342445	93.86383379	90.90526133	88.0538634	85.3051976	82.65503098	80.09932885	77.63424432

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160330A00054	3/30/2016	2.9	3/31/2031	3/30/2016	117.19287	108.6924206	100.886495	93.71443657	87.12118421	81.05673019	75.47563272	70.33657791	65.60198568
170117A00046	1/17/2017	2.55	1/17/2024	1/17/2017	101.82413	100.6188384	99.44202184	98.29268097	97.16986164	96.0726534	95.00018708	93.95163244	92.92619606
170906A00020	9/6/2017	2.14	9/6/2023	9/6/2017	100.94382	100.0969205	99.26419274	98.44528279	97.63984878	96.84756013	96.06809697	95.30114973	94.54641874
190329A00018	3/29/2019	2.6	3/29/2024	3/29/2019	102.22211	100.8256756	99.45500163	98.1094402	96.78836176	95.49115733	94.21723765	92.96603242	91.73698952
190816A00006	8/16/2019	1.77	8/16/2024	8/16/2019	101.42205	99.66192015	97.94055575	96.25682564	94.60963842	92.99794347	91.42072903	89.87702044	88.36587837
200429A00045	5/1/2020	1.54	4/30/2025	5/1/2020	101.62945	99.18911925	96.81974322	94.51884944	92.2840717	90.11314024	88.00387717	85.95419216	83.96207832
210106A00006	1/8/2021	0.48	7/17/2023	1/8/2021	99.646993	98.94173259	98.24640663	97.56080613	96.88472813	96.21797531	95.56035578	94.91168285	94.27177492
221031A00003	10/31/2022	4.89	11/12/2024	10/31/2022	108.06751	106.0072081	103.9971831	102.0358866	100.1218252	98.25356181	96.42971351	94.64894885	92.90998559
140521A00019	5/21/2014	3.43	5/22/2028	5/21/2014	116.09821	110.3733673	104.9724218	99.87527922	95.06319729	90.51868743	86.2254242	82.16816193	78.33265781
180720A00068	7/20/2018	2.89	7/20/2023	7/20/2018	101.45281	100.7314317	100.0203128	99.31923219	98.62797811	97.94634481	97.27413224	96.61114588	95.95719652
180727A00039	7/27/2018	3.48	7/27/2028	7/27/2018	115.97825	110.1083458	104.5788835	99.36821528	94.4561847	89.82401951	85.45422873	81.33050812	77.43765317
200428A00013	4/30/2020	1.49	4/29/2024	4/30/2020	100.6905	99.22290545	97.78396354	96.37290676	94.98899733	93.63152297	92.29979581	90.99315135	89.71094744
210129A00013	1/29/2021	0.65	1/9/2025	1/29/2021	99.406098	97.28591354	95.22070934	93.20866896	91.24805155	89.3371878	87.47447627	85.65838005	83.88742357
170609A00026	6/9/2017	2.3	6/9/2023	6/9/2017	100.8583	100.2505504	99.65011658	99.05686616	98.47067066	97.89140468	97.31894579	96.75317442	96.19397379
180827A00010	8/27/2018	2.99	8/25/2023	8/27/2018	101.61719	100.7993114	99.99458366	99.20269618	98.42334325	97.65622884	96.90106619	96.15757743	95.42549325
190523A00020	5/23/2019	2.5	2/9/2024	5/23/2019	101.86022	100.5942786	99.3563484	98.14549996	96.96084368	95.80152894	94.66674195	93.55570376	92.46766839
190826A00065	8/26/2019	2.09	8/28/2029	8/26/2019	108.87001	102.1898107	95.96621843	90.16568114	84.75727634	79.71248917	75.00501373	70.61057166	66.50674651
191004A00002	10/4/2019	2.08	10/4/2029	10/4/2019	108.8573	102.0845591	95.7811099	89.91201401	84.44510279	79.35074425	74.60163108	70.17258742	66.04039263
200327A00036	3/27/2020	0.77	9/27/2023	3/27/2020	99.828443	98.92985302	98.04733215	97.18045284	96.32880254	95.49198312	94.66961017	93.86131248	93.06673147
150601A00490	6/1/2015	3.19	7/2/2024	6/1/2015	103.6085	101.9462267	100.3185485	98.72444694	97.1629454	95.63310527	94.134024	92.66483337	91.22469783
160830A00038	8/30/2016	2.24	8/28/2026	8/30/2016	105.79627	102.0206912	98.40066111	94.928978	91.59881318	88.40368729	85.3374506	82.39426453	79.56858431
170518A00034	5/18/2017	2.15	5/18/2023	5/18/2017	100.76889	100.2203663	99.67781506	99.14113679	98.61023636	98.08502067	97.56539863	97.05128107	96.54258072
190402A00004	4/2/2019	2.9	4/2/2029	4/2/2019	114.70742	108.1808935	102.0748505	96.35995712	91.00906837	85.99705648	81.30065151	76.89829507	72.77000629
190829A00031	8/29/2019	1.54	8/29/2024	8/29/2019	101.27484	99.47801461	97.72150574	96.00416849	94.32490082	92.68263886	91.07635528	89.50505781	87.96778781
200131A00010	2/3/2020	1.68	2/3/2023	2/3/2020	100.32589	100.0630618	99.8016102	99.54152279	99.28278897	99.02539823	98.76934013	98.51460437	98.26118074
200221A00004	2/21/2020	1.69	2/21/2025	2/21/2020	101.82409	99.55986065	97.35688829	95.2131616	93.12674707	91.0957867	89.11849449	87.19315322	85.31811125
200224A00021	2/24/2020	1.58	9/24/2024	2/24/2020	101.18541	99.32460582	97.50694247	95.73116413	93.99606221	92.30047078	90.64326477	89.02335827	87.43970289
200504A00015	5/4/2020	0.68	5/4/2023	5/4/2020	99.93479	99.42732829	98.92500097	98.42773006	97.93543954	97.44805491	96.96550314	96.48771264	96.01461324
220217A00021	2/17/2022	1.85	2/13/2024	2/17/2022	101.04023	99.76939706	98.5255052	97.30769723	96.11515449	94.94709271	93.80276025	92.68143634	91.58242952
220916A00043	9/16/2022	4.07	9/16/2031	9/16/2022	127.81119	118.4321882	109.8455457	101.97941	94.76881674	88.15499276	82.08473687	76.50986513	71.38671396
170313A00032	3/13/2017	3.69	6/14/2032	3/13/2017	124.23108	114.3821968	105.4278309	97.28110016	89.86401713	83.10653164	76.94568447	71.32485543	66.19309456
171206A00048	12/6/2017	3.04	12/6/2032	12/6/2017	120.03063	109.8745826	100.6902211	92.37866849	84.85160712	78.03010437	71.84357128	66.22884111	61.12935399
190821A00030	8/21/2019	1.8	8/21/2024	8/21/2019	101.49199	99.71819521	97.98371842	96.2874247	94.6282206	93.00505232	91.41690398	89.86279589	88.34178298

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200109A00012	1/14/2020	1.94	12/15/2022	1/14/2020	100.2256	100.1008491	99.97641962	99.85231427	99.72853179	99.60507088	99.48193027	99.35910867	99.23660481
200304A00034	3/4/2020	1.12	3/4/2024	3/4/2020	100.12411	98.80769989	97.51457453	96.24417016	94.99594042	93.769356	92.56390399	91.37908724	90.21442378
200430A00009	4/30/2020	1.16	4/30/2026	4/30/2020	101.36084	97.97663543	94.72282235	91.59369287	88.58382211	85.68805082	82.90147089	80.21941165	77.63742708
210428A00007	4/28/2021	1.74	10/27/2028	4/28/2021	106.2004	100.3744358	94.90470505	89.76761577	84.94125484	80.40525976	76.14070137	72.12997599	68.35670625
211222A00025	12/22/2021	1.2	7/15/2024	12/22/2021	100.34657	98.67919414	97.04714581	95.44936273	93.88482919	92.35256986	90.85164774	89.38116226	87.94024746
221031A00044	10/31/2022	4.89	10/31/2024	10/31/2022	107.92591	105.9003622	103.923762	101.9946159	100.1114887	98.27299884	96.47781579	94.72465768	93.01228932
150601A01024	6/1/2015	5.33	2/27/2026	6/1/2015	114.81222	111.3628174	108.0381179	104.8329492	101.742382	98.76171654	95.88647037	93.11236741	90.43532721
170322A00011	3/22/2017	2.48	3/22/2024	3/22/2017	102.19307	100.8124009	99.45694775	98.1260799	96.81918682	95.5356778	94.27498111	93.03654323	91.81982813
170831A00022	8/31/2017	2.27	2/29/2024	8/31/2017	101.66634	100.3494402	99.05565867	97.78444262	96.53525259	95.30756581	94.10087564	92.9146909	91.74853535
180914A00026	9/14/2018	3.15	9/14/2023	9/14/2018	101.85111	100.9785318	100.1209082	99.27785279	98.44899639	97.63398215	96.8324651	96.04411168	95.26859923
190510A00018	5/10/2019	2.54	5/10/2023	5/10/2019	100.90865	100.3819942	99.86083557	99.34508755	98.83466605	98.32948872	97.82947494	97.33454571	96.84462366
190620A00057	6/25/2019	2.09	5/15/2023	6/25/2019	100.68054	100.1410248	99.60729094	99.0792436	98.55679214	98.03984781	97.52832375	97.0221349	96.52119798
200227A00026	2/27/2020	1.41	2/27/2023	2/27/2020	100.2839	99.95520034	99.62865169	99.30422852	98.98191021	98.66167636	98.34350687	98.02738189	97.71328179
210917A00008	9/17/2021	1.55	9/15/2028	9/17/2021	105.03965	99.35198268	94.00647471	88.98085471	84.25440548	79.80784992	75.62324419	71.68387923	67.97419001
150317A00012	3/17/2015	2.46	3/18/2024	3/17/2015	102.14964	100.7797349	99.43468458	98.11386783	96.81668674	95.5425626	94.29093519	93.06126201	91.85301759
150601A00523	6/1/2015	4.55	7/25/2031	6/1/2015	129.75021	120.4904497	111.9970471	104.2016745	97.042461	90.46335282	84.41353682	78.84692411	73.72168704
150601A00734	6/1/2015	2.92	5/1/2025	6/1/2015	104.97979	102.4944411	100.0811043	97.73728157	95.46057304	93.24867657	91.09938331	89.01057321	86.9802109
150819A00013	8/19/2015	3.51	8/19/2030	8/19/2015	120.13335	112.1452867	104.7627011	97.93620929	91.62070895	85.77498368	80.36134954	75.34533525	70.69539293
170110A00020	1/10/2017	2.4	1/10/2024	1/10/2017	101.74409	100.5558506	99.39529282	98.26145602	97.15342514	96.07032654	95.01132562	93.97562469	92.96246093
170203A00012	2/3/2017	3.63	2/2/2035	2/3/2017	127.63221	115.2702215	104.2904857	94.52853455	85.84036523	78.09979435	71.19616613	65.03236601	59.52309744
200302A00036	3/2/2020	1.45	3/2/2026	3/2/2020	102.18797	98.94100996	95.81362834	92.80082258	89.89782586	87.10009402	84.40329405	81.80329313	79.29614834
200429A00015	4/29/2020	0.66	4/29/2024	4/29/2020	99.618005	98.15586733	96.72233594	95.31664618	93.9380605	92.58586689	91.2593778	89.95792905	88.68087886
200429A00046	5/1/2020	2.07	4/30/2025	5/1/2020	102.95536	100.4982382	98.11244094	95.79548658	93.54499802	91.35869503	89.23438964	87.16998184	85.16345539
180503A00040	5/3/2018	3.3	5/5/2025	5/3/2018	106.06771	103.5579694	101.1210643	98.75445865	96.45571854	94.22250954	92.05259218	89.9438174	87.89412228
190329A00017	3/29/2019	2.59	3/29/2023	3/29/2019	100.78699	100.3750896	99.96654567	99.5613206	99.15937413	98.76066662	98.36515909	97.97281316	97.58359106
190605A00020	6/5/2019	2.19	2/5/2024	6/5/2019	101.45468	100.2017406	98.97775853	97.78173048	96.61270011	95.46975449	94.35202166	93.25866833	92.18889775
190816A00031	8/16/2019	1.77	8/16/2024	8/16/2019	101.42205	99.66192015	97.94055575	96.25682564	94.60963842	92.99794347	91.42072903	89.87702044	88.36587837
190826A00058	8/26/2019	1.91	8/26/2026	8/26/2019	104.52835	100.7820787	97.19022137	93.745624	90.44150368	87.2714252	84.22928132	81.30927433	78.50589866
200227A00016	2/27/2020	1.47	2/27/2025	2/27/2020	101.33183	99.05626122	96.8427059	94.68914282	92.59362655	90.55428587	88.56932051	86.63699805	84.75565093
191122A00018	11/26/2019	3.11	11/22/2039	11/26/2019	123.82174	107.9114968	94.37483781	82.83723611	72.98543504	64.55712815	57.33242496	51.12678353	45.78515169
200303A00010	3/3/2020	1.34	3/3/2025	3/3/2020	101.03548	98.75291366	96.53284216	94.37321983	92.27208211	90.22753937	88.23777359	86.30103525	84.41564033
200414A00016	4/16/2020	1.64	4/15/2024	4/16/2020	100.8898	99.45799004	98.05344374	96.67544982	95.32332238	93.99639864	92.69403799	91.41562105	90.16054881
200922A00030	9/24/2020	2.45	9/25/2023	9/24/2020	101.27051	100.3713599	99.48814009	98.62043091	97.76782645	96.92993482	96.1063776	95.29678924	94.50081653

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220927A00071	9/27/2022	4.7	9/26/2024	9/27/2022	107.16283	105.2380689	103.3577958	101.5207157	99.72558014	97.97118523	96.2563693	94.58001128	92.94102901
171208A00008	12/8/2017	2.25	12/8/2022	12/8/2017	100.24289	100.1373568	100.0320559	99.92698873	99.82215444	99.71755225	99.61318135	99.50904093	99.4051302
180604A00050	6/4/2018	3.15	6/4/2024	6/4/2018	103.40668	101.8225453	100.2703727	98.74926212	97.25834574	95.79678785	94.36378332	92.95855616	91.58035827
191121A00010	11/21/2019	2.59	11/20/2037	11/21/2019	118.6107	104.4094917	92.13736284	81.51834291	72.31739428	64.3341546	57.39766096	51.36189951	46.10204776
191212A00028	12/13/2019	1.93	1/17/2023	12/13/2019	100.34178	100.12574	99.91064173	99.69647952	99.4832472	99.27093868	99.0595479	98.84906887	98.63949566
220302A00006	3/2/2022	1.52	4/25/2023	3/2/2022	100.36091	99.87659753	99.39694868	98.92189617	98.45137416	97.98531808	97.52366459	97.06635151	96.61331786
220815A00006	8/15/2022	3.52	8/15/2024	8/15/2022	104.56809	102.781444	101.0339942	99.3245942	97.65213858	96.01556332	94.41384404	92.84599407	91.31106274
160628A00050	6/28/2016	1.56	6/28/2023	6/28/2016	100.47119	99.81288192	99.16317293	98.52189133	97.88887406	97.26396223	96.64700101	96.03783948	95.43633052
180102A00021	1/2/2018	2.82	1/2/2026	1/2/2018	106.33416	103.1795058	100.1353801	97.19726042	94.36083695	91.62200318	88.97684484	86.42162956	83.9527971
180619A00021	6/19/2018	3.24	6/19/2028	6/19/2018	115.22576	109.4487705	104.0028165	98.86711422	94.02229696	89.45030933	85.13431121	81.05858955	77.20847699
190924A00035	9/24/2019	1.88	9/13/2024	9/24/2019	101.7182	99.88152794	98.08680791	96.332834	94.61844718	92.94252869	91.3039984	89.70181322	88.13496558
191122A00020	11/26/2019	3.2	11/23/2037	11/26/2019	125.12741	110.6141174	98.04634337	87.14787045	77.68324328	69.4515589	62.28123037	56.02556699	50.55904035
191212A00019	12/13/2019	1.93	12/19/2022	12/13/2019	100.24162	100.1057748	99.97031036	99.83522624	99.70052083	99.5661925	99.43223965	99.29866068	99.16545401
200515A00001	5/15/2020	0.59	5/15/2023	5/15/2020	99.86545	99.32848967	98.79728864	98.27175474	97.75179756	97.23732861	96.72826125	96.22451067	95.72599382
200313A00032	3/18/2020	1.46	3/18/2025	3/18/2020	101.34376	99.01918288	96.75921396	94.5617075	92.42460234	90.34591721	88.3237472	86.35626032	84.4416943
200511A00028	5/13/2020	1.02	5/13/2024	5/13/2020	99.976646	98.47843542	97.00988626	95.57018874	94.15856239	92.77425446	91.41653868	90.08471408	88.7781039
151211A00055	12/11/2015	2.62	12/11/2024	12/11/2015	103.86572	101.7661901	99.71951563	97.72400652	95.77803934	93.88005484	92.02855485	90.22209933	88.4593037
170615A00015	6/15/2017	2.25	6/14/2024	6/15/2017	102.2193	100.6142973	99.04211728	97.50182065	95.99250182	94.51328943	93.06334464	91.64185964	90.24805615
170912A00009	9/12/2017	2.11	12/15/2022	9/12/2017	100.24685	100.1220733	99.99762013	99.87349117	99.74968514	99.62620072	99.50303666	99.38019166	99.25766446
180130A00091	1/30/2018	2.74	1/25/2023	1/30/2018	100.55971	100.3212681	100.0839626	99.84778472	99.61272638	99.37877965	99.14593666	98.9141896	98.68353074
181004A00029	10/4/2018	3.7	10/4/2028	10/4/2018	117.69503	111.5921249	105.8529282	100.4537813	95.37268418	90.58917064	86.08419356	81.84001963	77.84013239
190122A00042	1/22/2019	2.79	1/23/2023	1/22/2019	100.58592	100.3526776	100.1205275	99.88946115	99.65947081	99.43054894	99.20268808	98.97588082	98.7501198
200123A00049	1/23/2020	1.63	1/23/2023	1/23/2020	100.31532	100.0825128	99.85079865	99.62016657	99.39060893	99.16211819	98.9346869	98.70830764	98.48297308
200130A00021	1/30/2020	1.54	1/30/2023	1/30/2020	100.31025	100.058157	99.80732352	99.55774471	99.30941114	99.06231354	98.81644273	98.57178961	98.32834518
180205A00050	2/5/2018	2.81	2/6/2023	2/5/2018	100.64108	100.3694094	100.0992116	99.83047138	99.563177	99.29731678	99.03287917	98.76985277	98.50822627
180731A00004	7/31/2018	2.97	7/31/2023	7/31/2018	101.56195	100.8104813	100.070114	99.34060528	98.62171776	97.91322072	97.21489015	96.52650842	95.84786409
190807A00014	8/7/2019	1.75	8/7/2023	8/7/2019	100.58094	99.81570931	99.06208439	98.3198035	97.58861193	96.86826256	96.15851558	95.45913817	94.76990432
190820A00021	8/20/2019	2.13	8/20/2029	8/20/2019	109.12708	102.4582775	96.24382328	90.45040235	85.04730952	80.00622863	75.30103503	70.90761551	66.80370381
200806A00002	8/6/2020	0.43	8/6/2024	8/6/2020	99.237594	97.5194247	95.83874502	94.1944253	92.58538079	91.01056966	89.46899088	87.95968215	86.48171801
211206A00010	12/6/2021	1.54	12/4/2026	12/6/2021	103.49141	99.50568332	95.69482439	92.05024121	88.56380884	85.22784405	82.03507874	78.97863515	76.05200263
220429A00006	4/29/2022	3.06	4/29/2024	4/29/2022	103.05291	101.5668504	100.1097573	98.68086113	97.27941583	95.90470099	94.55602096	93.23270372	91.93409989
130926A00009	9/26/2013	4	10/2/2028	9/26/2013	120.33676	114.1309765	108.2944488	102.8031739	97.63482624	92.76863672	88.18527637	83.86674945	79.79629501
151116A00025	11/16/2015	3.04	11/14/2025	11/16/2015	106.68237	103.6520512	100.7244446	97.89549471	95.16132789	92.51824588	89.96271651	87.49136529	85.10096733

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170918A00007	9/18/2017	2.8	9/20/2027	9/18/2017	110.51007	105.6088842	100.9563941	96.53869889	92.34274397	88.35626533	84.56773778	80.9663268	77.54184377
171212A00024	12/12/2017	2.29	12/12/2022	12/12/2017	100.26832	100.1516792	100.0353218	99.91925001	99.80346293	99.68795941	99.57273837	99.45779874	99.34313943
191004A00032	10/4/2019	2.01	1/3/2028	10/4/2019	107.03135	101.9432316	97.1277141	92.56875304	88.25133448	84.16140325	80.2857964	76.61218164	73.12900041
200429A00058	5/1/2020	1.83	4/30/2025	5/1/2020	102.35494	99.90542962	97.52706839	95.21738674	92.97401252	90.79467022	88.67717645	86.61943557	84.61943558
200604A00001	6/4/2020	0.65	6/5/2023	6/4/2020	99.856325	99.2627972	98.67629405	98.09669115	97.52386733	96.95770424	96.39808627	95.84490047	95.29803648
160119A00025	1/19/2016	3.05	1/19/2028	1/19/2016	112.47185	107.2034212	102.2171686	97.49642404	93.02559821	88.79010295	84.77628104	80.97134151	77.36329987
160504A00004	5/4/2016	2.3	5/4/2026	5/4/2016	105.82307	102.3386154	98.98817076	95.76586775	92.66612399	89.68363126	86.81334049	84.05044758	81.39038011
190215A00005	2/15/2019	2.89	2/15/2024	2/15/2019	102.41532	101.1296681	99.87063111	98.63738755	97.42914872	96.24515825	95.08469047	93.94704886	92.83156454
190814A00006	8/14/2019	1.84	8/14/2023	8/14/2019	100.66089	99.87659346	99.10448805	98.34428856	97.59572109	96.85852007	96.13242799	95.41719504	94.71257887
190930A00070	9/30/2019	1.93	9/27/2024	9/30/2019	101.86468	99.98922401	98.15739101	96.36790508	94.61953978	92.91111215	91.24148086	89.60954444	88.01423968
200922A00027	9/24/2020	1.65	9/23/2025	9/24/2020	102.30315	99.47409945	96.73751273	94.08988513	91.52786377	89.0482405	86.64794479	84.32403704	82.0737023
180814A00032	8/14/2018	3.1	8/14/2025	8/14/2018	106.60109	103.807657	101.1021096	98.48116363	95.94167618	93.48064192	91.095186	88.78255743	86.54012291
190220A00007	2/20/2019	2.87	2/20/2024	2/20/2019	102.4231	101.1242712	99.85083861	98.60207545	97.37727999	96.17577735	94.99691816	93.84007733	92.70465296
190225A00026	2/25/2019	3.43	2/27/2034	2/25/2019	125.71253	114.1675954	103.8358664	94.58180372	86.28571054	78.84180899	72.1565567	66.14717439	60.74035702
190930A00012	9/30/2019	1.93	9/30/2024	9/30/2019	101.87593	99.99236988	98.15278787	96.35589663	94.60045504	92.88526618	91.20917542	89.57106862	87.96987047
191025A00010	10/25/2019	2.24	7/25/2028	10/25/2019	108.91211	103.2460835	97.91160297	92.88749484	88.15405115	83.69292029	79.48700615	75.52037537	71.77817198
130702A00018	7/2/2013	3.17	7/17/2023	7/2/2013	101.64045	100.9264174	100.2224227	99.52825379	98.84370564	98.16857902	97.50268013	96.84582045	96.19781659
150720A00011	7/20/2015	2.69	7/20/2023	7/20/2015	101.30764	100.5868536	99.87631353	99.17580593	98.48511918	97.80404761	97.13239126	96.4699557	95.81655181
190110A00013	1/10/2019	2.97	1/17/2024	1/10/2019	102.33773	101.1291181	99.94904085	98.79649236	97.67051698	96.57020289	95.49467958	94.44311554	93.4147161
191120A00011	11/20/2019	1.88	1/20/2023	11/20/2019	100.33973	100.1154206	99.89212792	99.66984154	99.44855461	99.22826034	99.00895204	98.79062305	98.57326679
200305A00036	3/5/2020	1.36	3/5/2027	3/5/2020	103.0121	98.79884623	94.78037779	90.94673656	87.28852007	83.79685004	80.46334063	77.2800687	74.23954602
160129A00067	1/29/2016	2.53	1/29/2026	1/29/2016	105.99648	102.7665562	99.65224068	96.64869292	93.75131005	90.9557119	88.25772856	85.65338867	83.1389085
170821A00038	8/23/2017	2.39	8/23/2024	8/23/2017	102.80798	101.0124264	99.25680047	97.53995315	95.86077787	94.21820781	92.61121415	91.03880441	89.5000209
190110A00009	1/10/2019	2.97	1/16/2024	1/10/2019	102.33228	101.1263645	99.94885047	98.79874662	97.67510341	96.57701478	95.50361564	94.45407956	93.42761666
190514A00020	5/14/2019	2.66	5/14/2025	5/14/2019	104.50572	101.9923099	99.55245489	97.18356999	94.88317728	92.64890139	90.47846442	88.36968135	86.32045556
190820A00019	8/20/2019	1.76	8/21/2023	8/20/2019	100.60598	99.80322429	99.01323931	98.23572193	97.47037871	96.71692535	95.97508636	95.2445947	94.52519145
210924A00005	9/24/2021	2.37	9/24/2036	9/24/2021	113.40996	100.5831597	89.38762797	79.60510786	71.04764062	63.55322545	56.98211801	51.21367243	46.1436447
150601A00665	6/1/2015	3.82	1/14/2033	6/1/2015	125.83736	115.3833872	105.927222	97.36712141	89.61225274	82.5814727	76.20224668	70.40969339	65.14574012
150826A00039	8/26/2015	3.22	8/27/2029	8/26/2015	117.49704	110.4930514	103.9633193	97.87313848	92.1905188	86.8859563	81.9322281	77.30420517	72.97868135
160816A00003	8/16/2016	1.63	8/16/2023	8/16/2016	100.56653	99.77635516	98.99856306	98.23286053	97.47896724	96.73661148	96.00552983	95.28546682	94.57617467
171214A00005	12/14/2017	2.29	12/14/2022	12/14/2017	100.27893	100.1567322	100.0348503	99.91328102	99.79202319	99.67107555	99.55043684	99.43010586	99.31008138
091112A00011	11/12/2009	4.77	11/15/2024	11/12/2009	108.12892	106.0545105	104.0309392	102.0566312	100.1300694	98.2497941	96.41440113	94.62253878	92.87290561
111216A00001	12/16/2011	3.95	12/30/2031	12/16/2011	125.89878	116.3969773	107.7198552	99.79065139	92.5401508	85.90590761	79.83155011	74.26616013	69.16371872

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150603A00017	6/3/2015	2.84	6/3/2025	6/3/2015	105.41991	102.8346552	100.326228	97.89188216	95.52898449	93.23501316	91.00755221	88.8442863	86.74299578
180406A00014	4/6/2018	2.95	4/6/2023	4/6/2018	100.97258	100.5383473	100.1078504	99.68104016	99.25786919	98.83829107	98.42226013	98.00973147	97.60066096
190208A00005	2/8/2019	2.63	2/8/2023	2/8/2019	100.62821	100.3507578	100.0748451	99.80045627	99.52757857	99.25619951	98.98630671	98.71788791	98.45093102
190529A00031	5/29/2019	2.36	5/30/2023	5/29/2019	100.86906	100.2882984	99.71420941	99.14667544	98.58558474	98.03082813	97.48229888	96.93989266	96.40350744
190821A00017	8/21/2019	1.8	8/21/2024	8/21/2019	101.49199	99.71819521	97.98371842	96.2874247	94.6282206	93.00505232	91.41690398	89.86279589	88.34178298
191120A00024	11/20/2019	2.23	11/16/2029	11/20/2019	109.95783	103.0408707	96.6096885	90.62760892	85.06090374	79.87854333	75.05196769	70.55487803	66.36304694
200505A00004	5/5/2020	0.77	5/5/2025	5/5/2020	100.02492	97.5852566	95.21705124	92.91780635	90.68512291	88.51670047	86.41033237	84.36390134	82.37537524
200731A00004	7/31/2020	0.38	7/31/2023	7/31/2020	99.6035	98.86018815	98.12789418	97.406375	96.69539452	95.99472352	95.30413935	94.62342575	93.95237258
210607A00001	6/7/2021	0.46	6/7/2023	6/7/2021	99.736726	99.13823659	98.54689799	97.96258273	97.3851663	96.81452709	96.25054633	95.69310802	95.14209885
210608A00017	6/10/2021	2.67	6/8/2029	6/10/2021	112.52929	105.9341107	99.77457817	94.01957276	88.64035261	83.6103632	78.90505987	74.50174569	70.37942316
190517A00005	5/17/2019	2.31	5/17/2024	5/17/2019	102.18344	100.6536972	99.15435889	97.68459232	96.24359153	94.83057953	93.4448069	92.0855506	90.7521128
190528A00006	5/28/2019	2.43	9/15/2023	5/28/2019	101.22086	100.3486246	99.49139955	98.6487952	97.82043965	97.00597356	96.20504958	95.41733188	94.64249563
200205A00013	2/5/2020	1.77	2/6/2023	2/5/2020	100.35812	100.0869632	99.81727242	99.54903713	99.28224557	99.01688608	98.75294715	98.49041737	98.22928545
200604A00005	6/4/2020	0.89	6/4/2025	6/4/2020	100.02235	97.51257927	95.07781321	92.71535857	90.4226396	88.19718962	86.03664551	83.9387427	81.90131027
221018A00049	10/18/2022	4.59	10/18/2027	10/18/2022	119.50192	114.3075635	109.3774555	104.6966969	100.2513084	96.02816685	92.01494844	88.20007603	84.57267001
190110A00003	1/10/2019	2.97	1/10/2024	1/10/2019	102.29963	101.1098492	99.94772189	98.81229562	97.70265737	96.6179354	95.55729685	94.51994567	93.50512054
190820A00029	8/20/2019	1.76	8/20/2024	8/20/2019	101.41629	99.64580322	97.91451347	96.22128641	94.56502932	92.94468934	91.35925169	89.80773796	88.2892045
210817A00013	8/19/2021	2	8/19/2026	8/19/2021	104.83723	101.103161	97.52224977	94.0874108	90.79192198	87.62940749	84.59381792	81.67941168	78.88073757
220922A00042	9/22/2022	4.6	3/22/2024	9/22/2022	104.99632	103.5978108	102.2247807	100.8765915	99.55262639	98.25228847	96.97500013	95.72020214	94.48735292
221026A00031	10/26/2022	4.9	4/26/2024	10/26/2022	105.7892	104.2899265	102.8196832	101.3777007	99.96323478	98.57556655	97.21400184	95.87786995	94.5665227
110505A00022	5/5/2011	4.59	5/15/2026	5/5/2011	113.50894	109.8718609	106.3738621	103.0088477	99.77102541	96.65488816	93.65519862	90.76697423	87.98547338
170228A00015	2/28/2017	2.87	5/28/2025	2/28/2017	105.1214	102.5633703	100.0809014	97.6713069	95.33201393	93.06055735	90.85457475	88.71180128	86.63006504
181109A00023	11/9/2018	3.39	11/9/2022	11/9/2018	100.08715	100.0621448	100.0371619	100.0122054	99.98727537	99.96237165	99.93749423	99.91264307	99.88781813
190805A00011	8/5/2019	1.91	8/5/2024	8/5/2019	101.63615	99.90270971	98.20689942	96.54758731	94.92368393	93.33414312	91.77795976	90.25416776	88.76183811
200227A00012	2/27/2020	1.41	2/27/2023	2/27/2020	100.2839	99.95520034	99.62865169	99.30422852	98.98191021	98.66167636	98.34350687	98.02738189	97.71328179
200305A00002	3/5/2020	1.14	3/5/2025	3/5/2020	100.56851	98.28640362	96.06694528	93.9080778	91.80782758	89.76429645	87.77565834	85.84015613	83.95609867
210715A00009	7/15/2021	0.54	7/17/2023	7/15/2021	99.69003	98.98459799	98.28910227	97.60333368	96.92708924	96.26017161	95.60238886	94.95355429	94.31348626
180126A00028	1/26/2018	2.69	1/26/2023	1/26/2018	100.55294	100.3117564	100.0717302	99.83285592	99.5951254	99.35853042	99.12306285	98.88871467	98.6554779
190819A00026	8/19/2019	1.62	8/19/2024	8/19/2019	101.39172	99.61988104	97.88729377	96.19281241	94.53533858	92.91381428	91.32722008	89.77457336	88.25492666
190823A00005	8/23/2019	1.62	8/23/2024	8/23/2019	101.40384	99.62145471	97.87874913	96.17458437	94.50786044	92.87751683	91.28253083	89.72191584	88.19471982
171030A00021	10/30/2017	2.29	11/30/2022	10/30/2017	100.19466	100.1114402	100.0283602	99.9454158	99.86260684	99.77993296	99.69739384	99.61498918	99.53271866
180918A00011	9/18/2018	3.17	9/18/2023	9/18/2018	101.88942	101.0059535	100.1378049	99.28458044	98.44589736	97.6213859	96.81068878	96.0134606	95.22936744
190328A00019	3/28/2019	2.56	3/28/2024	3/28/2019	102.16151	100.7681274	99.40040597	98.05770234	96.73939031	95.44486409	94.17353752	92.92484323	91.69823191

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190529A00023	5/29/2019	2.38	5/29/2024	5/29/2019	102.14417	100.5866069	99.06029782	97.56436982	96.09798161	94.66032264	93.25061174	91.86809568	90.512048
200818A00009	8/18/2020	1.7	8/18/2033	8/18/2020	105.29358	95.3607565	86.45381986	78.46134464	71.28452661	64.83569755	59.03702067	53.8193446	49.12119585
151223A00074	12/23/2015	3.01	12/23/2027	12/23/2015	112.86108	107.6288779	102.6741028	97.98053648	93.5329972	89.31726726	85.32002638	81.5287901	77.93185279
160119A00019	1/19/2016	2.95	1/19/2027	1/19/2016	109.58072	105.3503844	101.3087376	97.44630254	93.75413745	90.22379946	86.84731358	83.61714381	80.52616626
160707A00032	7/7/2016	1.52	7/7/2023	7/7/2016	100.45009	99.76766404	99.09448353	98.43036044	97.77511284	97.12856368	96.49054055	95.8608756	95.23940536
190830A00010	9/3/2019	1.75	9/1/2023	9/3/2019	100.60295	99.77096135	98.95267903	98.14776356	97.35588968	96.5767426	95.8100176	95.05541959	94.31266278
200402A00011	4/2/2020	0.8	3/31/2023	4/2/2020	100.04461	99.62909857	99.21701752	98.80832823	98.40298905	98.00095903	97.60219786	97.20666592	96.81432418
201208A00031	12/10/2020	1.43	12/9/2024	12/10/2020	101.06225	99.00356065	96.99666548	95.039913	93.13171636	91.27055117	89.4549525	87.68351208	85.95487562
210624A00020	6/24/2021	0.78	6/24/2024	6/24/2021	99.634386	98.02774592	96.45433497	94.91318686	93.40337271	91.92399926	90.47420716	89.05316932	87.66008936
130405A00006	4/5/2013	2.41	4/7/2025	4/5/2013	104.0165	101.6006098	99.25318791	96.97190767	94.7545392	92.59894125	90.50305705	88.46491045	86.48260229
160119A00029	1/19/2016	3.39	1/20/2032	1/19/2016	120.95213	111.6166943	103.1011599	95.32853937	88.22946942	81.74142222	75.80799822	70.37829562	65.40634764
170328A00015	3/28/2017	2.75	11/29/2024	3/28/2017	103.79892	101.7370361	99.72641729	97.76544856	95.85257753	93.98631207	92.16521741	90.38791349	88.65307243
180918A00041	9/18/2018	3.18	9/18/2024	9/18/2018	104.44256	102.561598	100.7238443	98.92805432	97.17302493	95.45759543	93.78064554	92.14109377	90.53789582
200226A00015	2/26/2020	1.53	2/26/2024	2/26/2020	100.66512	99.36303487	98.08467845	96.82944015	95.59673007	94.38597821	93.19663368	92.02816386	90.88005368
200304A00040	3/4/2020	1.12	3/1/2024	3/4/2020	100.12454	98.81587241	97.53023243	96.26706254	95.02582523	93.80599962	92.60708092	91.42857974	90.27002157
200604A00012	6/4/2020	1.59	6/4/2030	6/4/2020	105.45461	98.2028195	91.49904003	85.29906995	79.56248887	74.25231343	69.33468875	64.77860891	60.55566387
200626A00014	6/26/2020	0.62	6/26/2025	6/26/2020	99.661817	97.09139963	94.59933237	92.18274236	89.83888305	87.56512725	85.35896101	83.21797783	81.13987327
211222A00004	12/22/2021	1.26	10/15/2024	12/22/2021	100.60822	98.69874926	96.83481192	95.01504772	93.2381456	91.50284222	89.80791986	88.15220447	86.53456377
220112A00004	1/12/2022	1.55	1/12/2026	1/12/2022	102.75173	99.6184146	96.59639687	93.68106914	90.86804365	88.15314215	85.5323843	83.00197689	80.55830369
120127A00019	1/27/2012	3.87	1/30/2032	1/27/2012	125.31325	115.7600352	107.0432089	99.08427223	91.81251038	85.16418093	79.0817919	73.51345767	68.41232466
140626A00036	6/26/2014	3.55	6/26/2029	6/26/2014	119.37564	112.4730683	106.0265001	100.0032341	94.37308706	89.10818564	84.18277714	79.57305752	75.25701401
150827A00029	8/27/2015	2.74	8/27/2024	8/27/2015	103.4706	101.6582929	99.88646443	98.15396443	96.45968139	94.8025428	93.18151351	91.59559409	90.0438194
180104A00018	1/4/2018	2.97	1/4/2027	1/4/2018	109.55499	105.3644488	101.3592933	97.53029028	93.86872393	90.36636008	87.01541661	83.80853595	80.73875929
180530A00025	5/30/2018	3.49	5/30/2030	5/30/2018	119.64143	111.880886	104.6942818	98.03586982	91.86378628	86.13969863	80.82849055	75.89797632	71.31864203
180718A00026	7/18/2018	3.03	7/18/2023	7/18/2018	101.48063	100.7653682	100.0601904	99.36488254	98.67923829	98.00305696	97.33614341	96.67830782	96.02936555
181005A00016	10/5/2018	3.26	1/10/2023	10/5/2018	100.58256	100.3854787	100.1891766	99.99365279	99.79890272	99.60492172	99.41170519	99.21924858	99.02754736
190819A00004	8/20/2019	1.81	5/24/2024	8/20/2019	101.22597	99.68900744	98.18276062	96.7063777	95.25903754	93.83994871	92.44834822	91.08350017	89.74469457
200122A00034	1/22/2020	1.87	1/22/2024	1/22/2020	101.00473	99.79155573	98.60738934	97.45120312	96.32201453	95.21888656	94.14092512	93.08727659	92.05712559
200922A00035	9/24/2020	2.94	9/23/2024	9/24/2020	103.77458	101.8911429	100.0512008	98.25349682	96.49681439	94.77997966	93.10185992	91.46136184	89.85742987
220630A00045	6/30/2022	3.39	6/30/2026	6/30/2022	109.67647	105.9827532	102.434934	99.02642273	95.75096352	92.60261951	89.57575435	86.66501508	83.86531606
120709A00016	7/9/2012	3.2	7/15/2027	7/9/2012	112.02704	107.2654849	102.7369875	98.42885192	94.32914243	90.42663732	86.71078182	83.17164457	79.79987711
180618A00026	6/18/2018	3.05	4/13/2023	6/18/2018	101.04987	100.5963153	100.1468413	99.70138919	99.25990496	98.82233565	98.38862924	97.95873462	97.53260157
190131A00019	1/31/2019	3.44	1/30/2034	1/31/2019	125.68686	114.2174954	103.9455526	94.73802911	86.47739964	79.05974128	72.39309313	66.39602153	60.9963639

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190211A00016	2/11/2019	3.01	2/11/2025	2/11/2019	104.81148	102.5411246	100.3313012	98.17999717	96.08528295	94.04530717	92.05829282	90.12253368	88.23639087
190521A00043	5/21/2019	2.54	5/22/2023	5/21/2019	100.94805	100.3887107	99.8355654	99.28851259	98.74745191	98.21228521	97.68291645	97.15925169	96.64119902
190808A00052	8/8/2019	1.7	8/8/2024	8/8/2019	101.50097	99.7568617	98.05083841	96.38175857	94.74852671	93.15009021	91.58543721	90.05359459	88.55362611
201208A00029	12/10/2020	1.52	12/9/2025	12/10/2020	102.14081	99.11439919	96.19290146	93.37208834	90.64792492	88.01656304	85.47433138	83.01772613	80.64340228
210527A00026	6/1/2021	2.78	6/1/2028	6/1/2021	111.73557	106.1318178	100.8474169	95.86246185	91.15839102	86.71788916	82.5247971	78.5640286	74.82149359
211222A00030	12/22/2021	1.33	1/15/2025	12/22/2021	100.91157	98.75909994	96.66267548	94.62043757	92.63060156	90.69145667	88.80136223	86.95874415	85.1620916
160606A00005	6/6/2016	2.92	6/6/2031	6/6/2016	116.27555	107.7028864	99.84266137	92.63159354	86.0123387	79.93290537	74.34612954	69.20920345	64.4832525
190206A00013	2/6/2019	2.68	2/6/2023	2/6/2019	100.63251	100.3605663	100.0900954	99.82108705	99.55352935	99.28741053	99.02271897	98.75944317	98.49757174
190808A00025	8/8/2019	1.7	8/8/2024	8/8/2019	101.50097	99.7568617	98.05083841	96.38175857	94.74852671	93.15009021	91.58543721	90.05359459	88.55362611
190816A00022	8/16/2019	1.77	8/16/2024	8/16/2019	101.42205	99.66192015	97.94055575	96.25682564	94.60963842	92.99794347	91.42072903	89.87702044	88.36587837
200103A00009	1/3/2020	1.9	1/3/2024	1/3/2020	100.99416	99.83114611	98.69479657	97.58420276	96.49849698	95.43685009	94.39846943	93.38259681	92.38850666
200309A00004	3/9/2020	0.71	3/8/2024	3/9/2020	99.724793	98.39835285	97.09558043	95.81589737	94.55874404	93.32357849	92.10987567	90.91712685	89.74483897
180621A00017	6/21/2018	3.42	6/21/2028	6/21/2018	115.41457	109.6555617	104.2258723	99.10485589	94.27327259	89.71318356	85.40785601	81.34167561	77.50006596
180719A00061	7/19/2018	3.07	7/19/2023	7/19/2018	101.51411	100.7960205	100.0880915	99.39010694	98.70185811	98.02314212	97.35376168	96.69352495	96.04224529
180730A00078	7/30/2018	3.14	7/28/2023	7/30/2018	101.60856	100.8658496	100.1339911	99.41274482	98.70188104	98.00117673	97.3104152	96.62938585	95.95788401
191031A00033	10/31/2019	2.2	5/31/2028	10/31/2019	108.51668	103.0038016	97.8063786	92.90470979	88.28042726	83.91639755	79.79663228	75.90620577	72.23117897
191106A00022	11/6/2019	2.34	1/2/2030	11/6/2019	110.81582	103.7515676	97.19051665	91.09412736	85.42700736	80.15663777	75.25312555	70.68897849	66.43890049
191218A00014	12/18/2019	2.04	12/18/2024	12/18/2019	102.38541	100.2890039	98.24569615	96.25377369	94.31159542	92.41758568	90.57023099	88.76807709	87.00972612
201116A00010	11/16/2020	0.57	11/15/2023	11/16/2020	99.469919	98.44526255	97.4415534	96.45815531	95.49445719	94.54987221	93.62383666	92.71580879	91.82526775
220923A00035	9/23/2022	4.7	3/22/2024	9/23/2022	105.1364	103.7368648	102.3628273	101.0136476	99.68870844	98.38741266	97.10918213	95.85345721	94.61969594
170427A00044	4/27/2017	3.02	4/27/2027	4/27/2017	110.57326	106.0569492	101.7536714	97.65224551	93.74213994	90.01342744	86.45674721	83.06326953	79.82466294
180920A00014	9/20/2018	3.59	9/20/2028	9/20/2018	116.95953	110.9153069	105.2294769	99.87885958	94.84188532	90.09847957	85.62995192	81.41889395	77.44908521
190807A00021	8/7/2019	2	8/7/2026	8/7/2019	104.7791	101.0771236	97.52584813	94.11829865	90.84786769	87.70829119	84.69362842	81.79824322	79.01678638
191003A00014	10/3/2019	1.71	9/20/2024	10/3/2019	101.42091	99.56845613	97.75871445	95.99044985	94.26247168	92.57363106	90.92281919	89.30896564	87.73103677
200306A00001	3/6/2020	1.11	3/6/2026	3/6/2020	101.06376	97.82549065	94.70701766	91.70330849	88.80957123	86.02123859	83.33395617	80.74357144	78.24612334
200327A00075	3/31/2020	1.75	3/29/2024	3/31/2020	101.01516	99.62765824	98.26577076	96.92884716	95.61626191	94.32740987	93.06170552	91.81858215	90.59749107
200730A00001	7/30/2020	0.46	7/30/2024	7/30/2020	99.291953	97.59137572	95.92756669	94.29939971	92.70579517	91.14571745	89.61817272	88.1222067	86.65690272
150401A00008	4/1/2015	2.62	4/1/2025	4/1/2015	104.17984	101.7846111	99.45667811	97.19378051	94.99374439	92.85448136	90.77398466	88.7503255	86.78164954
160811A00011	8/11/2016	2.25	8/11/2026	8/11/2016	105.74057	102.0101534	98.4317859	94.99843314	91.70343051	88.54045863	85.5035233	82.58693671	79.78529991
180403A00041	4/3/2018	2.91	4/3/2025	4/3/2018	105.21257	102.7926595	100.4409366	98.15509771	95.93293276	93.77231902	91.67121714	89.62766728	87.63978558
180917A00078	9/17/2018	3.05	9/15/2023	9/17/2018	101.85522	100.9787493	100.1173609	99.27066619	98.43829131	97.61987487	96.81506759	96.02353176	95.24494077
181029A00081	10/29/2018	3.27	4/28/2023	10/29/2018	101.23138	100.7364055	100.2462624	99.76088301	99.28019806	98.80413972	98.33264147	97.86563804	97.40306541
181116A00015	11/19/2018	3.29	2/15/2024	11/19/2018	102.93625	101.6470292	100.3844884	99.14779959	97.93617248	96.74884916	95.58510247	94.44423443	93.32557479

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191004A00001	10/4/2019	2.47	10/4/2034	10/4/2019	113.90035	102.5962418	92.55002777	83.61398365	75.65846326	68.569604	62.24733412	56.60364006	51.56105904
200226A00005	2/26/2020	1.53	2/27/2023	2/26/2020	100.32353	99.99475372	99.66812301	99.3436182	99.02121863	98.70090393	98.38265397	98.06644891	97.75226913
211222A00010	12/22/2021	1.06	1/16/2024	12/22/2021	100.00189	98.81097732	97.6482282	96.51264968	95.40329874	94.31927554	93.25972099	92.22381445	91.21077159
160211A00035	2/11/2016	2.25	2/11/2025	2/11/2016	103.07126	100.8211541	98.63115737	96.49926861	94.42357025	92.40222248	90.43345946	88.5155857	86.64697265
180815A00021	8/15/2018	3.01	8/15/2023	8/15/2018	101.59505	100.8039942	100.0252553	99.25854663	98.50359082	97.76011882	97.02786978	96.30659073	95.59603624
180831A00019	8/31/2018	3.21	9/2/2025	8/31/2018	106.67186	103.8355594	101.0897686	98.43112368	95.85640701	93.36253708	90.94656195	88.60565307	86.33709951
190808A00009	8/8/2019	1.89	8/8/2024	8/8/2019	101.61097	99.86993019	98.16684121	96.50056441	94.87000979	93.27412994	91.71191792	90.18240528	88.68466019
191223A00055	12/23/2019	2.46	12/7/2029	12/23/2019	111.60939	104.5822776	98.05094328	91.97774946	86.32810467	81.07020153	76.17477904	71.61490624	67.36578539
200511A00016	5/11/2020	0.71	2/1/2024	5/11/2020	99.564417	98.33451165	97.13433493	95.96281916	94.81894687	93.70174823	92.61029835	91.54371462	90.50115442
170120A00011	1/20/2017	3.75	1/20/2037	1/20/2017	131.89225	117.5993705	105.1142584	94.19364184	84.6283881	76.23854178	68.86910969	62.3864739	56.67533654
180619A00023	6/19/2018	3.04	6/19/2023	6/19/2018	101.35608	100.7195487	100.0910133	99.4703227	98.85733056	98.25189413	97.65387418	97.06313487	96.47954369
181023A00025	10/23/2018	3.27	10/23/2023	10/23/2018	102.16655	101.1881997	100.2285933	99.28719154	98.36347968	97.45696213	96.56716165	95.69361858	94.83588994
200430A00008	4/30/2020	0.94	4/30/2025	4/30/2020	100.12841	97.70709778	95.35631184	93.07359986	90.85660794	88.70307821	86.61084418	84.57782648	82.6020288
211222A00008	12/22/2021	1.13	4/15/2024	12/22/2021	100.14192	98.71581855	97.31688573	95.94440945	94.59770638	93.27611626	91.97900087	90.70574315	89.45574632
160930A00005	9/30/2016	2.03	9/30/2024	9/30/2016	102.06842	100.1829668	98.34152297	96.54280507	94.78557102	93.06862296	91.39080533	89.75100313	88.14814021
170130A00031	1/30/2017	2.96	7/30/2025	1/30/2017	105.74954	103.0156673	100.3666404	97.79927049	95.31051217	92.89745674	90.55732493	88.28746003	86.08532144
200127A00030	1/27/2020	1.8	1/27/2025	1/27/2020	101.98754	99.79193035	97.65408522	95.57206221	93.54400023	91.5681164	89.64270197	87.76611861	85.93679473
200228A00031	2/28/2020	1.35	2/28/2024	2/28/2020	100.43044	99.12480173	97.84237948	96.58260177	95.34491514	94.12878382	92.93368904	91.75912833	90.60461495
200302A00053	3/2/2020	1.31	3/3/2025	3/2/2020	100.96515	98.68342598	96.46417347	94.30535289	92.20500019	90.16122621	88.17221341	86.23621272	84.35154057
210428A00008	4/28/2021	1.93	4/26/2030	4/28/2021	107.98546	100.7354816	94.02482696	87.81057667	82.0534353	76.71740668	71.76950132	67.1794713	62.91956968
160706A00010	7/6/2016	1.99	7/7/2025	7/6/2016	103.00265	100.3661194	97.81018155	95.33186005	92.92831315	90.59682369	88.3347927	86.13973326	84.00926481
190326A00032	3/26/2019	2.4	3/26/2024	3/26/2019	102.09565	100.7052483	99.34041701	98.00050735	96.68489666	95.39298255	94.12418209	92.87793108	91.65368321
190328A00046	3/28/2019	2.7	3/4/2025	3/28/2019	104.22869	101.9055318	99.64581117	97.44745255	95.30846201	93.22692175	91.20098674	89.22888155	87.30889729
191121A00004	11/21/2019	1.77	11/21/2024	11/21/2019	101.99165	99.96542035	97.98942056	96.06207345	94.18186739	92.34734888	90.55711986	88.8098351	87.10419983
120306A00004	3/6/2012	2.95	3/15/2023	3/6/2012	100.8692	100.4954119	100.1244045	99.75614488	99.39060243	99.02774706	98.6675491	98.30997932	97.95500893
171026A00010	10/26/2017	2.84	10/26/2026	10/26/2017	108.50638	104.5233051	100.7101141	97.05866161	93.56123758	90.21054052	86.99965351	83.9220219	80.97143235
190523A00023	5/23/2019	2.48	3/22/2023	5/23/2019	100.71732	100.3247271	99.93519894	99.54869921	99.16519261	98.78464442	98.40702042	98.03228694	97.66041082
190821A00028	8/21/2019	1.8	8/21/2023	8/21/2019	100.63853	99.83562762	99.04549922	98.26784002	97.50235654	96.74876447	96.00678827	95.27616088	94.55662335
200312A00004	3/13/2020	1.23	1/24/2025	3/13/2020	100.7017	98.52849529	96.41238074	94.35144438	92.34385116	90.38784285	88.48173414	86.62390888	84.81281661
210305A00013	3/5/2021	2.41	3/5/2036	3/5/2021	113.79263	101.3671555	90.46653293	80.89373925	72.47819101	65.072079	58.54722556	52.79238898	47.71094942
210609A00011	6/11/2021	1.32	6/11/2024	6/11/2021	100.50318	98.92403739	97.37707044	95.8613612	94.37602667	92.92021692	91.49311355	90.0939282	88.72190114
180823A00053	8/23/2018	3.2	8/23/2028	8/23/2018	115.38638	109.4319375	103.8280166	98.55210812	93.58326069	88.90196673	84.49005557	80.33059528	76.40780205
190328A00031	4/25/2019	2.56	4/25/2024	4/25/2019	102.28294	100.8136334	99.37278201	97.95963357	96.57345992	95.21355788	93.8792482	92.56987457	91.28480264

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190528A00028	5/28/2019	2.42	5/30/2023	5/28/2019	100.90415	100.3232725	99.74906793	99.18141931	98.62021489	98.06534548	97.51670435	96.97418713	96.4376918
190603A00005	6/3/2019	2.25	6/3/2024	6/3/2019	101.95947	100.390054	98.85229676	97.34530882	95.86823174	94.42023872	93.00053316	91.60834727	90.24294074
190816A00020	8/16/2019	1.79	8/16/2024	8/16/2019	101.4581	99.69763069	97.97593838	96.29188634	94.64438304	93.03237767	91.45485835	89.91085024	88.39941388
190826A00030	8/26/2019	1.72	8/26/2026	8/26/2019	104.3026	100.547087	96.94674094	93.49436226	90.18312198	87.00654186	83.95847443	81.03308437	78.22483097
191119A00027	11/19/2019	1.8	11/19/2024	11/19/2019	102.04624	100.024834	98.05345097	96.13052365	94.25454987	92.42408505	90.63773953	88.89417605	87.19210737
200131A00032	1/31/2020	2.1	1/31/2030	1/31/2020	109.1457	102.068986	95.50241001	89.40648344	83.74497476	78.48462509	73.59488913	69.04770001	64.81725583
220510A00014	5/13/2022	2.72	11/6/2023	5/13/2022	101.68549	100.672386	99.67943661	98.70604644	97.75164166	96.81567066	95.89760301	94.99692847	94.11315606
180222A00025	2/22/2018	3.48	2/22/2033	2/22/2018	124.69922	114.1198975	104.5654269	95.93001806	88.11934599	81.04925207	74.64460052	68.83826866	63.57025473
190906A00012	9/6/2019	1.76	9/6/2024	9/6/2019	101.46973	99.65413105	97.87961769	96.14502925	94.44924049	92.79116489	91.16975306	89.58399124	88.03289985
190429A00004	4/29/2019	2.65	4/15/2024	4/29/2019	102.3709	100.9277806	99.51211745	98.12319646	96.76032661	95.42284021	94.11009188	92.82145767	91.55633414
190808A00024	8/8/2019	1.69	2/8/2024	8/8/2019	100.96644	99.70678788	98.47538449	97.27127772	96.09355983	94.94136333	93.81385865	92.71025217	91.62978421
191115A00015	11/18/2019	2.61	11/18/2024	11/18/2019	103.44505	101.4167096	99.43835857	97.5084357	95.6254445	93.78794562	91.99455427	90.24393768	88.53481279
200727A00016	7/27/2020	0.43	7/27/2023	7/27/2020	99.65076	98.91793651	98.1958267	97.48419718	96.78282128	96.09147882	95.40995587	94.73804456	94.07554283
200922A00033	9/24/2020	2.37	9/23/2024	9/24/2020	102.68824	100.8154149	98.98588684	97.19840152	95.45174764	93.74475662	92.07630077	90.44529162	88.85067827
190712A00018	7/12/2019	2.25	7/12/2024	7/12/2019	102.1342	100.4588461	98.81881313	97.21304494	95.64053062	94.10029919	92.59141764	91.11298904	89.66415075
200224A00024	2/24/2020	1.59	2/24/2025	2/24/2020	101.60211	99.33191369	97.12335966	94.97443013	92.88318548	90.84776101	88.86636348	86.93726796	85.05881476
200227A00030	2/27/2020	1.59	2/27/2026	2/27/2020	102.64327	99.39661801	96.26918373	93.2559915	90.35229645	87.55357531	84.85551485	82.25400102	79.74510873
150408A00004	4/8/2015	2.17	4/10/2023	4/8/2015	100.68227	100.2374209	99.79650542	99.35947131	98.92626738	98.49684333	98.07114973	97.649138	97.23076042
150601A00737	6/1/2015	2.68	12/31/2024	6/1/2015	104.02042	101.8665832	99.76793696	97.7226763	95.72907156	93.78546328	91.89025874	90.04192861	88.23900394
180622A00018	6/22/2018	2.92	6/22/2023	6/22/2018	101.34949	100.7041418	100.0670129	99.43794388	98.81678232	98.20337967	97.59759107	96.99927528	96.4082945
181211A00009	12/11/2018	3.14	12/11/2023	12/11/2018	102.32301	101.2129415	100.1269547	99.06427377	98.02415396	97.00588174	96.00877351	95.03217389	94.07545437
190529A00013	5/29/2019	2.38	5/29/2024	5/29/2019	102.14417	100.5866069	99.06029782	97.56436982	96.09798161	94.66032264	93.25061174	91.86809568	90.512048
210507A00008	5/7/2021	1.94	5/7/2031	5/7/2021	108.03349	99.87300162	92.39320221	85.53372979	79.23986181	73.46196442	68.15499571	63.27805978	58.79400611
130424A00004	4/24/2013	2.46	4/24/2025	4/24/2013	104.22632	101.7622557	99.36928234	97.04494609	94.78688967	92.59285134	90.46066042	88.38823299	86.37356792
131217A00024	12/17/2013	4.34	1/2/2029	12/17/2013	122.19472	115.7168164	109.6364911	103.9270513	98.56374269	93.5235955	88.78528633	84.32901133	80.13637003
150601A00666	6/1/2015	3.88	1/16/2035	6/1/2015	129.82847	117.3797732	106.3145846	96.46906978	87.69969392	79.88061033	72.90139409	66.66507662	61.08643974
190826A00057	8/26/2019	1.87	8/26/2025	8/26/2019	102.84176	100.0784781	97.40327094	94.81285703	92.30409967	89.87399595	87.51967029	85.23836829	83.0274509
200214A00002	2/14/2020	1.58	11/15/2024	2/14/2020	101.57957	99.57386619	97.61765194	95.70938516	93.8475857	92.03082988	90.25774784	88.52702111	86.83738025
200228A00014	2/28/2020	1.4	2/28/2025	2/28/2020	101.17122	98.89470933	96.68032123	94.52603132	92.42989264	90.39003222	88.40464787	86.47200504	84.59043396
201204A00016	12/8/2020	1.58	12/8/2023	12/8/2020	100.56816	99.4764788	98.40837919	97.36310275	96.33992419	95.33814868	94.35711024	93.39617027	92.45471616
211222A00020	12/22/2021	0.97	10/16/2023	12/22/2021	99.91033	98.9623081	98.03217109	97.11941707	96.22356246	95.34414147	94.4807053	93.63282136	92.80007253
170224A00039	5/24/2017	3.17	5/24/2027	5/24/2017	111.44757	106.8403531	102.4530473	98.27397564	94.29214007	90.49718237	86.87934328	83.42942457	80.13875381
190730A00016	7/30/2019	2	7/30/2024	7/30/2019	101.99916	100.2740719	98.58620159	96.93440967	95.31760442	93.73473864	92.18480733	90.66684545	89.17992597

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200224A00001	2/24/2020	1.59	2/24/2025	2/24/2020	101.60211	99.33191369	97.12335966	94.97443013	92.88318548	90.84776101	88.86636348	86.93726796	85.05881476
170915A00031	9/15/2017	2.1	9/15/2023	9/15/2017	101.01647	100.1440309	99.28661919	98.44385347	97.61536074	96.80078057	95.99976459	95.21197599	94.437089
181127A00027	11/27/2018	3.25	11/28/2022	11/27/2018	100.25635	100.1786097	100.1009932	100.0234992	99.94612732	99.86887743	99.79174921	99.71474239	99.63785669
190128A00035	1/28/2019	3.04	1/26/2024	1/28/2019	102.47403	101.2406659	100.0369711	98.86188699	97.71440189	96.59355139	95.49841559	94.42811651	93.38181575
190814A00003	8/14/2019	2.01	8/14/2029	8/14/2019	109.27659	102.5792432	96.33842325	90.52063884	85.0950207	80.03310485	75.30863329	70.8973722	66.77694603
201030A00005	11/2/2020	2.49	10/29/2040	11/2/2020	113.49153	97.77250052	84.54108759	73.38359012	63.95736954	55.97831852	49.21059154	43.45818026	38.55799511
160628A00049	6/28/2016	1.88	6/27/2025	6/28/2016	103.01868	100.4004401	97.86173458	95.3996512	93.01140471	90.69433091	88.44588045	86.26361293	84.14519143
161208A00007	12/8/2016	2.6	12/8/2023	12/8/2016	101.70358	100.6051825	99.53046492	98.47866908	97.44906719	96.44096207	95.45368546	94.48659656	93.53908061
190715A00010	7/15/2019	2.23	7/15/2024	7/15/2019	102.11293	100.4299327	98.7825448	97.16969723	95.59036673	94.04357072	92.52836519	91.04384282	89.58913117
190828A00020	8/28/2019	1.95	5/28/2027	8/28/2019	105.92656	101.4336362	97.15721416	93.0857295	89.20829676	85.51466636	81.99518393	78.6407525	75.44279733
200818A00008	8/18/2020	1.5	8/18/2031	8/18/2020	104.20022	95.95915279	88.42927371	81.54561902	75.24946707	69.48770584	64.21227147	59.37964551	54.9504046
140313A00030	3/13/2014	3.27	3/15/2024	3/13/2014	103.25818	101.8881023	100.5427398	99.2214854	97.92374677	96.64895057	95.39654165	94.16598241	92.95675201
140710A00027	7/10/2014	2.8	7/17/2023	7/10/2014	101.37496	100.6619874	99.95904098	99.26590993	98.58238947	97.90828049	97.24338936	96.58752773	95.94051236
150720A00012	7/20/2015	2.99	7/21/2025	7/20/2015	106.13451	103.4108946	100.7713166	98.21263958	95.73186527	93.32612896	90.99269242	88.72893727	86.53235877
170824A00038	8/24/2017	2.23	8/24/2023	8/24/2017	100.98793	100.1755546	99.37622006	98.58961264	97.81543012	97.05337978	96.30317806	95.56455015	94.83722971
190107A00010	1/7/2019	2.66	1/9/2023	1/7/2019	100.48021	100.2858131	100.0921778	99.89930168	99.70718021	99.51580891	99.32518333	99.13529905	98.9461517
190215A00017	2/15/2019	2.89	2/15/2024	2/15/2019	102.41532	101.1296681	99.87063111	98.63738755	97.42914872	96.24515825	95.08469047	93.94704886	92.83156454
190729A00008	7/29/2019	2.18	1/29/2024	7/29/2019	101.411	100.1767108	98.97234913	97.79684094	96.64915905	95.52832454	94.43340388	93.36350641	92.31778185
200310A00042	3/10/2020	1.41	3/11/2030	3/10/2020	104.19682	97.19425404	90.70739818	84.69574001	79.1221347	73.95251273	69.15561132	64.70273052	60.56751163
200511A00023	5/11/2020	1.7	2/3/2031	5/11/2020	106.10984	98.25183701	91.03291847	84.39779646	78.29623615	72.68256936	67.5152574	62.75649783	58.37187064
150826A00038	8/26/2015	2.94	8/26/2026	8/26/2015	108.96112	105.1168005	101.4303183	97.89437396	94.50204099	91.24674784	88.12225803	85.12265117	82.24230528
160129A00066	1/29/2016	3.04	1/29/2031	1/29/2016	118.16534	109.7852736	102.076283	94.98076861	88.44636993	82.42546453	76.87471576	71.75466569	67.02936874
160706A00026	7/6/2016	2.19	7/6/2027	7/6/2016	107.25886	102.6312341	98.23058316	94.04455107	90.06152648	86.27059058	82.66147167	79.22450308	75.95058408
170224A00021	2/24/2017	3.4	2/24/2032	2/24/2017	121.16245	111.7279734	103.1297964	95.28873999	88.13352396	81.59993827	75.63010858	70.17184153	65.1780406
180716A00054	7/16/2018	3.59	7/16/2040	7/16/2018	133.90624	116.52681	101.8016518	89.30036457	78.66499692	69.59749122	61.84935759	55.21317462	49.51558608
180823A00055	8/23/2018	3.44	8/23/2033	8/23/2018	125.03318	113.9877989	104.0572346	95.12173833	87.07504384	79.82278488	73.28110669	67.37544562	62.03945598
190122A00043	1/22/2019	2.96	1/22/2025	1/22/2019	104.85783	102.6366983	100.4736482	98.36673713	96.31410296	94.31396147	92.3646022	90.4643848	88.61173538
190409A00033	4/9/2019	2.62	6/9/2023	4/9/2019	101.05428	100.4458538	99.84474612	99.25082754	98.66396956	98.08404671	97.51093646	96.94451917	96.384678
191120A00031	11/20/2019	1.69	11/21/2022	11/20/2019	100.10828	100.0499786	99.99175488	99.93361247	99.87555124	99.817571	99.7596716	99.70185286	99.64411461
200731A00005	7/31/2020	0.45	7/31/2024	7/31/2020	99.274143	97.57114883	95.90501865	94.27462235	92.67887612	91.1167404	89.58721763	88.08935002	86.62221756
200803A00005	8/3/2020	0.54	6/30/2023	8/3/2020	99.729095	99.06894358	98.41747791	97.77452741	97.13992623	96.51351282	95.89512976	95.28462364	94.68184493
211022A00008	10/22/2021	1.12	10/22/2024	10/22/2021	100.34061	98.41594478	96.53761076	94.70420746	92.91438882	91.16685827	89.46036655	87.79370962	86.16572671
111024A00010	10/24/2011	3.11	10/30/2023	10/24/2011	102.15508	101.1565498	100.1775205	99.21742817	98.27572721	97.35189281	96.44541995	95.55582249	94.68263228

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150601A00688	6/1/2015	2.61	2/21/2025	6/1/2015	104.16762	101.8697082	99.63391558	97.45819942	95.34059763	93.27922492	91.2722692	89.31798824	87.41470646
170706A00090	7/6/2017	2.48	7/6/2023	7/6/2017	101.04799	100.3667466	99.69467127	99.03158272	98.37730153	97.731653	97.09446706	96.46557805	95.84482463
180110A00027	1/10/2018	2.6	1/10/2023	1/10/2018	100.45244	100.2555384	100.0594237	99.86408684	99.66952307	99.47572778	99.28269638	99.0904243	98.89890704
191126A00022	11/26/2019	1.72	5/26/2023	11/26/2019	100.54165	99.97217072	99.40912747	98.85241232	98.301919	97.75754363	97.21918461	96.68674259	96.16012041
191230A00013	12/30/2019	1.84	12/2/2024	12/30/2019	102.17807	100.1203413	98.11409316	96.15769208	94.24957086	92.38822351	90.57220229	88.80011503	87.0706225
200218A00024	2/20/2020	1.73	7/17/2023	2/20/2020	100.54359	99.83476179	99.13589904	98.44679671	97.7672513	97.09706491	96.43604507	95.7840046	95.14076133
200429A00051	5/1/2020	2.54	4/30/2025	5/1/2020	104.13117	101.659155	99.25879552	96.92759875	94.66317796	92.46324361	90.32559882	88.24813495	86.22882751
211222A00026	12/22/2021	1.2	7/15/2024	12/22/2021	100.34657	98.67919414	97.04714581	95.44936273	93.88482919	92.35256986	90.85164774	89.38116226	87.94024746
071231A00068	12/31/2007	4.93	12/30/2022	12/31/2007	100.80376	100.6366145	100.4700256	100.303988	100.1384988	99.97355535	99.80915504	99.64529518	99.48197312
160706A00030	7/6/2016	2.59	7/7/2031	7/6/2016	113.53745	105.0018775	97.1845196	90.02092016	83.45272605	77.42708388	71.89609504	66.81632738	62.14837743
170728A00040	7/28/2017	2.44	1/27/2025	7/28/2017	103.71848	101.4972453	99.33444926	97.2281213	95.17637749	93.17741318	91.22949888	89.33097638	87.48025517
171207A00036	12/7/2017	2.23	12/7/2022	12/7/2017	100.23565	100.1328884	100.0303531	99.92803896	99.82594512	99.72407088	99.62241549	99.52097823	99.41975835
180116A00014	1/16/2018	3.01	1/19/2027	1/16/2018	109.8329	105.5972931	101.5505385	97.68316027	93.98620997	90.45123837	87.07026442	83.83574636	80.74055481
180604A00048	6/4/2018	3.01	6/5/2023	6/4/2018	101.27565	100.6772779	100.0859759	99.5016145	98.924072	98.35322945	97.7889707	97.23118227	96.67975327
180910A00013	9/10/2018	3.08	9/11/2023	9/10/2018	101.77473	100.9105526	100.0610487	99.22584482	98.4045818	97.59691243	96.80250095	96.02102261	95.25216318
200214A00020	2/18/2020	1.78	1/15/2025	2/18/2020	101.90892	99.74519743	97.63775413	95.58472169	93.58430897	91.63479894	89.73454491	87.88196701	86.07554883
200226A00006	2/26/2020	1.57	2/26/2025	2/26/2020	101.56198	99.28653641	97.07302314	94.91941348	92.82376297	90.7842016	88.79893052	86.86621895	84.98440109
160307A00028	3/7/2016	2.91	3/7/2028	3/7/2016	112.01791	106.6310663	101.5396124	96.72581818	92.17310823	87.86597768	83.78991793	79.93134784	76.27755003
190104A00033	1/4/2019	3.37	1/31/2029	1/4/2019	116.41501	110.0362739	104.0563678	98.44811742	93.18634498	88.2477131	83.61058038	79.25486892	75.16194307
190110A00014	1/10/2019	2.97	1/17/2024	1/10/2019	102.33773	101.1291181	99.94904085	98.79649236	97.67051698	96.57020289	95.49467958	94.44311554	93.4147161
190627A00009	6/27/2019	1.93	6/27/2023	6/27/2019	100.71564	100.0591181	99.41113508	98.77152141	98.14011571	97.51676079	96.90130344	96.29359433	95.69348784
190628A00004	6/28/2019	2.12	6/28/2023	6/28/2019	100.7845	100.1257858	99.47565252	98.8339378	98.20047899	97.57511759	96.95769918	96.34807321	95.74609292
200709A00008	7/10/2020	1.88	7/10/2026	7/10/2020	104.20243	100.5831008	97.10868037	93.7725507	90.56843888	87.49039488	84.53277277	81.69021315	78.95762678
181227A00028	12/27/2018	3.46	12/27/2028	12/27/2018	116.77759	110.4788716	104.5685858	99.0206216	93.81075848	88.91652189	84.31704825	79.9929611	75.92625736
190110A00002	1/10/2019	2.93	1/10/2023	1/10/2019	100.5175	100.3205086	100.1243002	99.92886982	99.73421289	99.54032475	99.34720078	99.15483644	98.9632272
190603A00047	6/3/2019	2.22	6/2/2023	6/3/2019	100.79396	100.2053376	99.62357376	99.04854728	98.48014169	97.91824317	97.36274051	96.81352503	96.27049049
190617A00027	6/17/2019	2.21	6/16/2023	6/17/2019	100.81834	100.1918381	99.57311453	98.96202367	98.35842477	97.76218054	97.17315704	96.59122356	96.01625253
190816A00035	8/16/2019	1.77	8/16/2023	8/16/2019	100.59994	99.81067733	99.0337585	98.26890027	97.51582335	96.774257	96.04393873	95.324614	94.61603587
200311A00040	3/12/2020	1.3	3/11/2025	3/12/2020	100.95262	98.6506302	96.41219069	94.23520896	92.11767103	90.05764045	88.0532548	86.10272245	84.20431944
210818A00007	8/18/2021	0.81	8/18/2025	8/18/2021	100.20485	97.49133639	94.86417939	92.32014471	89.85613828	87.46920057	85.1564998	82.91532555	80.74308276
221028A00043	10/28/2022	4.88	4/24/2024	10/28/2022	105.73778	104.2443595	102.779761	101.343219	99.93399696	98.55138358	97.19469177	95.86325765	94.55643951
221018A00006	10/18/2022	4.55	10/18/2027	10/18/2022	119.30451	114.1149854	109.1895298	104.5132525	100.072182	95.85320236	91.8439969	88.03299503	84.4093234
150220A00021	2/20/2015	2.72	2/20/2024	2/20/2015	102.2257	100.9282329	99.65614094	98.40869593	97.1851968	95.98496928	94.80736455	93.6517581	92.51754852

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190318A00021	3/18/2019	2.76	3/18/2024	3/18/2019	102.40147	101.0323847	99.68809365	98.36798312	97.07145724	95.79793921	94.54687062	93.31771068	92.10993557
200131A00015	2/5/2020	1.73	2/5/2025	2/5/2020	101.85887	99.64007044	97.48021998	95.37733792	93.32952918	91.33497729	89.39194037	87.49874743	85.65379479
210226A00012	2/26/2021	2.31	2/26/2036	2/26/2021	112.52473	100.1954365	89.3797919	79.882307	71.53370458	64.18729149	57.71584478	52.00894033	46.97065928
210528A00003	5/28/2021	0.63	5/28/2024	5/28/2021	99.36811	97.83594183	96.33454529	94.86306151	93.42066312	92.0065529	90.61996244	89.26015083	87.92640338
220323A00008	3/23/2022	2.47	3/25/2024	3/23/2022	102.0233	100.6387389	99.27955503	97.94511099	96.63479042	95.34799698	94.08415353	92.84270137	91.6230995
221014A00026	10/14/2022	4.63	10/14/2027	10/14/2022	119.65786	114.4704714	109.5463881	104.8707954	100.4297919	96.21032602	92.2001393	88.38771439	84.76222643
160714A00054	7/14/2016	2.03	7/15/2024	7/14/2016	101.76994	100.0899835	98.44557413	96.8356517	95.25919439	93.71522104	92.20278898	90.72099223	89.26895957
180614A00038	6/14/2018	3.08	6/14/2023	6/14/2018	101.35884	100.7358249	100.1204678	99.51263066	98.91217597	98.31896966	97.73288087	97.15378188	96.58154803
190114A00040	1/14/2019	2.89	1/14/2025	1/14/2019	104.65167	102.453924	100.3132212	98.22767017	96.19545701	94.21484272	92.28415956	90.4018074	88.56625037
190530A00006	5/30/2019	2.25	5/30/2024	5/30/2019	102.14631	100.5826376	99.05042977	97.54880086	96.07690171	94.6339143	93.21905034	91.83154987	90.47068003
191108A00014	11/8/2019	2.25	11/8/2029	11/8/2019	111.08498	104.1089951	97.62229773	91.58798859	85.97212961	80.74349523	75.87334264	71.33520239	67.10468781
200504A00004	5/4/2020	0.75	5/5/2025	5/4/2020	99.974535	97.53550951	95.16793263	92.86930236	90.63722009	88.46938575	86.36359311	84.31772526	82.32975042
180126A00029	1/26/2018	2.88	1/27/2025	1/26/2018	104.41643	102.1930451	100.0279981	97.91933152	95.86516798	93.86370895	91.91323068	90.01208032	88.15867237
190131A00053	1/31/2019	2.67	1/31/2023	1/31/2019	100.60122	100.3458745	100.0918183	99.83904381	99.5875415	99.33730181	99.08831526	98.84057252	98.59406431
190411A00017	4/15/2019	2.65	4/15/2024	4/15/2019	102.3709	100.9277806	99.51211745	98.12319646	96.76032661	95.42284021	94.11009188	92.82145767	91.55633414
190717A00008	7/17/2019	2.22	7/17/2024	7/17/2019	102.12133	100.4327396	98.77996696	97.16193317	95.57760619	94.02599514	92.50614819	91.01715063	89.55812299
200203A00011	2/3/2020	1.7	2/15/2023	2/3/2020	100.35506	100.059185	99.76505857	99.47266706	99.18199511	98.89302754	98.60574934	98.32014568	98.03620189
200709A00006	7/10/2020	2.58	7/10/2030	7/10/2020	112.92933	105.3116959	98.26996017	91.7574218	85.73140413	80.15288724	74.98617643	70.19860243	65.76025018
200720A00034	7/20/2020	0.77	7/21/2025	7/20/2020	99.728269	97.10069057	94.55468365	92.08719454	89.695307	87.37623481	85.12731484	82.94600062	80.82985626
220406A00007	4/6/2022	2.87	4/8/2024	4/6/2022	102.65677	101.2303269	99.8306749	98.45712806	97.1090201	95.78570689	94.48656562	93.21099386	91.95840875
181227A00022	12/27/2019	2.91	12/27/2022	12/27/2019	100.42882	100.2706333	100.112947	99.95576071	99.79907207	99.64287875	99.48717841	99.33196873	99.17724741
200922A00034	9/24/2020	2.24	9/23/2026	9/24/2020	105.94354	102.0963808	98.41040667	94.87804365	91.49211264	88.24580671	85.13266992	82.14657733	79.2817164
051003A00009	10/3/2005	5.15	10/15/2025	10/3/2005	112.71591	109.6753004	106.7346771	103.8901928	101.1381745	98.47511038	95.897642	93.40255675	90.98678058
150601A00404	6/1/2015	4.29	1/17/2029	6/1/2015	121.62047	115.1200203	109.0211118	103.296621	97.92140697	92.87215253	88.12722185	83.66653028	79.47142489
160122A00029	1/22/2016	2.48	1/22/2025	1/22/2016	103.78326	101.5743636	99.42330126	97.32813234	95.2870019	93.29813255	91.35982049	89.47043168	87.62839841
160628A00038	6/28/2016	1.88	6/27/2025	6/28/2016	103.01868	100.4004401	97.86173458	95.3996512	93.01140471	90.69433091	88.44588045	86.26361293	84.14519143
200611A00010	6/11/2020	1.08	6/11/2027	6/11/2020	101.99608	97.55590999	93.33240538	89.31387821	85.48933501	81.84843045	78.38142545	75.07914836	71.93295875
171025A00026	10/25/2017	2.64	10/25/2024	10/25/2017	103.37335	101.4101062	99.49415886	97.62407258	95.7984692	94.01602152	92.27545095	90.57552538	88.91505716
181015A00024	10/15/2018	3.29	10/16/2023	10/15/2018	102.15538	101.195661	100.2539816	99.32983595	98.42273727	97.53221652	96.65782182	95.79911757	94.95568375
190621A00015	6/21/2019	2.2	6/21/2024	6/21/2019	101.95875	100.3405965	98.75574179	97.20322128	95.68210853	94.1915125	92.73057576	91.29847289	89.89440898
190805A00009	8/5/2019	1.91	8/5/2024	8/5/2019	101.63615	99.90270971	98.20689942	96.54758731	94.92368393	93.33414312	91.77795976	90.25416776	88.76183811
190816A00021	8/16/2019	1.77	8/16/2023	8/16/2019	100.59994	99.81067733	99.0337585	98.26890027	97.51582335	96.774257	96.04393873	95.324614	94.61603587
200225A00050	2/25/2020	1.57	2/25/2025	2/25/2020	101.55879	99.28624834	97.0754833	94.92447662	92.83128643	90.79404553	88.81095805	86.88029627	85.00039762

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220622A00010	6/22/2022	3.43	7/12/2024	6/22/2022	104.14813	102.45505	100.7976062	99.17473901	97.58542885	96.02869654	94.50360116	93.00923813	91.54473746
190107A00024	1/7/2019	2.91	1/5/2024	1/7/2019	102.20103	101.0251465	99.87629311	98.75354595	97.65602232	96.58287892	95.5333097	94.50654377	93.50184356
190211A00017	2/11/2019	3.12	2/11/2026	2/11/2019	107.59151	104.3088557	101.1444363	98.09331383	95.15079182	92.31239749	89.57386966	86.93114724	84.38035858
190607A00018	6/7/2019	2.19	6/7/2024	6/7/2019	101.88097	100.3013649	98.75377104	97.23727926	95.75101646	94.29414202	92.86584629	91.46534908	90.09189837
190801A00010	8/1/2019	1.97	8/1/2023	8/1/2019	100.80784	100.0568304	99.31696949	98.58801368	97.86972335	97.16186584	96.46421521	95.77655201	95.09866303
190816A00011	8/16/2019	1.77	8/16/2024	8/16/2019	101.42205	99.66192015	97.94055575	96.25682564	94.60963842	92.99794347	91.42072903	89.87702044	88.36587837
200326A00028	3/26/2020	1.54	3/26/2025	3/26/2020	101.55069	99.20315747	96.92138661	94.70317482	92.54640802	90.44905484	88.40916282	86.4248549	84.49432602
200922A00044	9/24/2020	2.61	9/25/2023	9/24/2020	101.41611	100.5162386	99.6323106	98.76390202	97.91060672	97.07203262	96.24780115	95.43754658	94.64091555
211005A00019	10/5/2021	0.47	10/5/2023	10/5/2021	99.539343	98.6210099	97.71949533	96.83434151	95.96510668	95.11136486	94.27270515	93.44873106	92.63905987
220106A00018	1/10/2022	3.11	1/8/2032	1/10/2022	118.40518	109.2112659	100.8251191	93.17097611	86.18056946	79.79234641	73.95077596	68.60573072	63.71193512
180530A00026	5/30/2018	3.55	5/30/2031	5/30/2018	121.55465	112.781464	104.7307983	97.33883386	90.54771747	84.30497304	78.562976	73.27848135	68.4121999
180816A00038	8/16/2018	3.38	8/16/2028	8/16/2018	115.52659	109.6167423	104.052767	98.81253832	93.87546173	89.22235912	84.83536397	80.69782487	76.79421677
191003A00019	10/3/2019	1.71	9/27/2024	10/3/2019	101.44299	99.5716763	97.7439069	95.95840808	94.21395553	92.50936833	90.8435071	89.2152723	87.62360253
200228A00005	2/28/2020	1.35	2/28/2024	2/28/2020	100.43044	99.12480173	97.84237948	96.58260177	95.34491514	94.12878382	92.93368904	91.75912833	90.60461495
200306A00030	3/6/2020	0.88	3/6/2023	3/6/2020	100.10251	99.75506773	99.41003302	99.06738402	98.727096	98.38914459	98.05350574	97.72015575	97.38907123
161213A00017	12/13/2016	2.24	12/13/2022	12/13/2016	100.26765	100.1482397	100.0291263	99.9103121	99.79179582	99.67357633	99.55565246	99.43802307	99.32068701
170929A00057	9/29/2017	2.16	9/29/2023	9/29/2017	101.10694	100.1966741	99.30274732	98.42471949	97.56216951	96.714691	95.88189169	95.06339282	94.25882857
180205A00019	2/5/2018	2.88	2/5/2025	2/5/2018	104.76984	102.5114521	100.3129829	98.17241812	96.0878313	94.05737586	92.07928116	90.15184865	88.27344827
200309A00005	3/9/2020	0.77	3/7/2025	3/9/2020	99.999432	97.7128288	95.48928174	93.3267161	91.22313759	89.17662847	87.18534417	85.24751007	83.3614184
081205A00033	12/5/2008	4.77	12/7/2023	12/5/2008	104.10856	102.9986217	101.9124647	100.8493274	99.8084821	98.78923173	97.79090787	96.8128695	95.85450159
190828A00031	8/28/2019	1.71	8/28/2024	8/28/2019	101.34906	99.55840573	97.80780023	96.09611044	94.42224071	92.78513346	91.18376759	89.61715697	88.08434904
200227A00009	2/27/2020	1.47	2/27/2025	2/27/2020	101.33183	99.05626122	96.8427059	94.68914282	92.59362655	90.55428587	88.56932051	86.63699805	84.75565093
200511A00017	5/11/2020	0.83	2/3/2025	5/11/2020	99.810422	97.6209752	95.48969554	93.4146238	91.39388343	89.42567632	87.50827882	85.64003791	83.81936765
151229A00080	12/29/2015	3.49	12/30/2030	12/29/2015	120.49577	112.1528547	104.4680787	97.38566184	90.85483562	84.82937181	79.26715399	74.12979158	69.38227194
180717A00047	7/17/2018	3.3	9/17/2025	7/17/2018	107.03946	104.1574328	101.3685522	98.66931049	96.05635529	93.52647778	91.07660596	88.70379799	86.40523598
180820A00055	8/20/2018	3.37	8/21/2028	8/20/2018	115.49837	109.5761551	104.0012813	98.75150165	93.80610863	89.1458186	84.75266689	80.60991088	76.70194085
190424A00023	4/24/2019	2.43	4/24/2023	4/24/2019	100.84535	100.3618642	99.8830114	99.40872593	98.93894265	98.47359763	98.01262811	97.55597254	97.10357051
190501A00028	5/1/2019	2.42	5/1/2024	5/1/2019	102.27794	100.7896469	99.3305049	97.89973167	96.49657298	95.12030087	93.77021251	92.44562905	91.14589467
200115A00017	1/15/2020	1.88	1/17/2023	1/15/2020	100.33095	100.1149273	99.89984571	99.6857001	99.47248433	99.26019229	99.04881795	98.8383553	98.62879841
200415A00035	4/17/2020	2.16	4/16/2025	4/17/2020	103.12489	100.702756	98.34987847	96.06388514	93.84250153	91.68354429	89.58491703	87.54460624	85.56067755
200429A00010	4/29/2020	0.78	4/29/2025	4/29/2020	100.0468	97.62232673	95.26853595	92.98296858	90.763264	88.60715795	86.5124779	84.47713873	82.49913867
200429A00043	5/1/2020	1.56	4/30/2025	5/1/2020	101.67948	99.23851996	96.86852427	94.56702443	92.33165383	90.1601423	88.0503116	86.00007101	84.0074133
200819A00007	8/19/2020	0.38	8/21/2023	8/19/2020	99.554561	98.75552891	97.96924464	97.19540476	96.43371579	95.68389343	94.94566217	94.21875499	93.50291302

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
060808A00022	8/8/2006	5.57	6/15/2026	8/8/2006	117.42226	113.6294313	109.9836099	106.478245	103.1071184	99.86432425	96.74425184	93.74156875	90.85120539
160718A00010	7/18/2016	1.65	7/18/2023	7/18/2016	100.55079	99.83842226	99.13611963	98.44367304	97.76087597	97.08752766	96.42343287	95.76840171	95.12224949
171002A00013	10/2/2017	2.23	11/30/2022	10/2/2017	100.18966	100.1064442	100.0233683	99.94042805	99.85762322	99.77495346	99.69241846	99.61001791	99.52775151
190809A00022	8/9/2019	1.88	8/9/2024	8/9/2019	101.59655	99.8530434	98.1475836	96.47903989	94.8463221	93.24838239	91.68421323	90.15284538	88.65334609
190926A00017	9/26/2019	2.23	9/26/2029	9/26/2019	109.86997	103.0830348	96.7643218	90.87909774	85.39537553	80.28368175	75.51684743	71.06981712	66.91947466
200306A00012	3/6/2020	0.95	3/6/2024	3/6/2020	99.893136	98.57320204	97.27669905	96.00305783	94.75172682	93.52217176	92.31387498	91.12633478	89.95906485
200428A00011	4/30/2020	1.95	4/29/2025	4/30/2020	102.65176	100.2011242	97.82157403	95.51063965	93.26595401	91.0852464	88.96633794	86.90713717	84.90563607
200529A00009	5/29/2020	0.42	5/30/2023	5/29/2020	99.786155	99.20835435	98.63720912	98.07260511	97.5144306	96.96257638	96.41693571	95.87740423	95.34387991
200720A00042	7/22/2020	2.04	7/21/2026	7/22/2020	104.8456	101.1861591	97.6740955	94.30263721	91.06536431	87.95618999	84.9693409	82.09933894	79.34098416
200730A00002	7/30/2020	0.67	11/6/2024	7/30/2020	99.447973	97.49354602	95.5869982	93.72685646	91.911704	90.14017725	88.41096342	86.72279829	85.07446399
200925A00004	9/25/2020	0.53	9/25/2023	9/25/2020	99.523363	98.63281624	97.758094	96.89877759	96.05446325	95.22476118	94.40929499	93.60770113	92.81962829
170111A00016	1/11/2017	3.51	1/11/2033	1/11/2017	123.30726	112.9834783	103.6476643	95.19896347	87.54734487	80.61238617	74.32220158	68.61249446	63.42571949
180620A00038	6/20/2018	3.4	6/20/2028	6/20/2018	115.29613	109.543117	104.1189917	99.00314476	94.17636721	89.62074842	85.31958142	81.25727565	77.41927646
180917A00032	9/17/2018	3.17	9/15/2023	9/17/2018	101.87388	100.9985193	100.1382015	99.29254148	98.46116661	97.64371682	96.83984407	96.04921183	95.27149462
190430A00002	4/30/2019	2.4	11/2/2022	4/30/2019	100.01426	100.0087005	100.0031481	99.9976005	99.99205777	99.98651986	99.98098677	99.97545849	99.96993501
191129A00012	11/29/2019	1.99	11/29/2024	11/29/2019	102.21172	100.1667525	98.17271038	96.22799187	94.33105386	92.48041312	90.67464346	88.91237307	87.19228203
160922A00014	9/22/2016	2.06	9/22/2026	9/22/2016	105.7505	101.8957009	98.20268557	94.66384455	91.27196287	88.0202001	84.9020689	81.911415	79.04239836
180801A00015	8/1/2018	3.16	8/1/2023	8/1/2018	101.64337	100.8897577	100.1473034	99.41576535	98.69490401	97.98448694	97.28428836	96.59408897	95.91367569
191002A00006	10/2/2019	1.84	10/2/2024	10/2/2019	101.70878	99.82171277	97.97883124	96.1788378	94.4204821	92.70255844	91.02390386	89.38339631	87.77995294
191107A00011	11/8/2019	2.02	2/24/2023	11/8/2019	100.4773	100.1564315	99.83761533	99.52082694	99.20604707	98.89325666	98.58243692	98.27356927	97.96663538
200403A00014	4/3/2020	0.63	4/17/2023	4/3/2020	99.982925	99.52090832	99.06315707	98.60961249	98.16021669	97.71491282	97.2736451	96.83635874	96.40299993
150904A00021	9/4/2015	2.52	9/5/2023	9/4/2015	101.35061	100.5033408	99.67020911	98.85086486	98.04496785	97.25218898	96.4722098	95.70472212	94.94942756
160616A00028	6/16/2016	1.81	6/16/2023	6/16/2016	100.56563	99.94003173	99.32220138	98.71199585	98.10927455	97.51390028	96.92573922	96.34466076	95.77053746
170609A00043	6/9/2017	3.07	6/9/2032	6/9/2017	119.80744	110.1037096	101.2885456	93.2752641	85.98607383	79.3511243	73.30765765	67.79925472	62.77516487
190826A00018	8/26/2019	1.9	8/27/2029	8/26/2019	108.55267	101.8466572	95.60039604	89.78002995	84.35435923	79.2946185	74.57427532	70.16884644	66.05573001
190927A00036	9/27/2019	1.94	9/6/2024	9/27/2019	101.80445	99.98564782	98.20799942	96.47033416	94.77152518	93.11048441	91.48616096	89.89753964	88.34363949
200227A00031	2/27/2020	1.43	2/27/2024	2/27/2020	100.53468	99.23090397	97.95060313	96.69318203	95.458069	94.24471117	93.05257374	91.88113916	90.72990655
200302A00034	3/2/2020	1.25	3/1/2024	3/2/2020	100.29917	98.98927506	97.7024277	96.43807073	95.19566607	93.97469234	92.7746442	91.59503178	90.43538008
200604A00010	6/4/2020	0.89	6/4/2025	6/4/2020	100.02235	97.51257927	95.07781321	92.71535857	90.4226396	88.19718962	86.03664551	83.9387427	81.90131027
220322A00010	3/22/2022	2.34	9/22/2023	3/22/2022	101.16172	100.2711	99.39612803	98.53639292	97.69149912	96.86106473	96.04472084	95.24211099	94.45289068
220909A00052	9/9/2022	3.95	3/8/2024	9/9/2022	103.97934	102.6251121	101.2949839	99.98836764	98.70469268	97.44340638	96.20397345	94.98587524	93.78860911
190530A00008	5/30/2019	2.38	5/30/2025	5/30/2019	104.20398	101.6454392	99.16281397	96.75339149	94.41457728	92.14388616	89.93893684	87.79744682	85.71722758
190830A00021	8/30/2019	1.76	8/30/2024	8/30/2019	101.44694	99.6501594	97.89366816	96.17632714	94.49703926	92.85474511	91.24842137	89.6770794	88.13976376

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191115A00014	11/18/2019	2.45	11/18/2024	11/18/2019	103.11569	101.0908196	99.11586285	97.18926794	95.30954022	93.47524216	91.68499071	89.93745477	88.23135288
141208A00008	12/8/2014	3.02	12/16/2024	12/8/2014	104.47016	102.3562702	100.2957094	98.28676168	96.32778379	94.41719761	92.55348714	90.73519552	88.96092221
160620A00015	6/20/2016	1.71	6/20/2023	6/20/2016	100.56269	99.92560343	99.29657677	98.67545323	98.06208445	97.45632579	96.85803619	96.26707804	95.68331712
170110A00022	1/10/2017	2.27	1/10/2023	1/10/2017	100.40869	100.2116301	100.015356	99.81986288	99.62514608	99.4312009	99.23802268	99.04560683	98.85394877
171219A00063	12/19/2017	2.8	12/20/2027	12/19/2017	111.76628	106.5697936	101.6488791	96.98744077	92.57040533	88.38365593	84.41396588	80.64893778	77.07694699
200228A00025	2/28/2020	1.57	3/2/2027	2/28/2020	103.91028	99.68527761	95.65502153	91.80957791	88.1395667	84.63612974	81.29089914	78.09596779	75.04386171
200228A00030	2/28/2020	1.32	2/28/2023	2/28/2020	100.25493	99.92356161	99.59437365	99.26734429	98.94245243	98.61967724	98.29899816	97.9803949	97.66384741
211222A00017	12/22/2021	0.88	7/17/2023	12/22/2021	99.933905	99.22750194	98.5310442	97.84432311	97.16713554	96.49928398	95.84057635	95.19082581	94.54985057
150316A00043	3/16/2015	2.37	3/16/2023	3/16/2015	100.68888	100.312393	99.93872676	99.56785331	99.19974132	98.83435991	98.47167864	98.11166754	97.75429707
170216A00045	2/16/2017	3.73	2/17/2037	2/16/2017	131.72786	117.3793483	104.8548418	93.90771481	84.32609718	75.92780787	68.55604952	62.07574651	56.37042776
190214A00013	2/14/2019	2.64	2/14/2023	2/14/2019	100.65906	100.3650214	100.0727134	99.78211686	99.49321676	99.20599817	98.92044634	98.63654674	98.35428496
191017A00022	10/17/2019	2.25	7/17/2028	10/17/2019	108.94562	103.2988876	97.98147199	92.97240827	88.25218106	83.80261335	79.60676741	75.64885359	71.91414632
200228A00066	2/28/2020	1.35	2/28/2024	2/28/2020	100.43044	99.12480173	97.84237948	96.58260177	95.34491514	94.12878382	92.93368904	91.75912833	90.60461495
200312A00042	3/16/2020	1.38	3/16/2023	3/16/2020	100.28145	99.90628443	99.53393252	99.16436086	98.7975383	98.43343415	98.07201818	97.7132606	97.35713207
210507A00009	5/7/2021	2.02	5/7/2032	5/7/2021	108.59938	99.55815838	91.34842433	83.88921147	77.10782686	70.93896521	65.32392439	60.20990779	55.54940345
130513A00007	5/13/2013	2.54	5/15/2023	5/13/2013	100.92506	100.3847854	99.85029163	99.32149026	98.79829051	98.28060357	97.7683425	97.26142217	96.75975923
160706A00028	7/6/2016	2.39	7/6/2029	7/6/2016	110.77329	104.1625926	97.99406562	92.23576667	86.85822581	81.83424033	77.13868865	72.74836057	68.64180214
190603A00033	6/3/2019	2.05	6/3/2024	6/3/2019	101.84495	100.2729814	98.73278474	97.22346127	95.74414836	94.2940153	92.87226181	91.47811657	90.11083597
200122A00035	1/22/2020	1.94	1/22/2025	1/22/2020	102.2862	100.1001086	97.97123608	95.89767101	93.8775794	91.90920384	89.99085958	88.12093078	86.2978671
200305A00009	3/10/2020	1.04	10/18/2023	3/10/2020	99.977321	99.02366123	98.08809009	97.17009712	96.26919072	95.38489746	94.51676124	93.66434254	92.82721766
220927A00073	9/27/2022	4.72	9/26/2025	9/27/2022	111.23279	108.2651528	105.3936855	102.6147465	99.92485633	97.32068564	94.79904802	92.35689301	89.99129952
190531A00013	5/31/2019	2.31	12/6/2022	5/31/2019	100.22653	100.1266758	100.0270263	99.92758392	99.82834789	99.72931761	99.63049242	99.53187167	99.4334547
190927A00012	10/1/2019	1.96	10/1/2024	10/1/2019	101.93705	100.0503095	98.20767494	96.40785626	94.64960702	92.93172519	91.25305129	89.61246657	88.00889133
200207A00004	2/7/2020	1.53	2/7/2023	2/7/2020	100.32117	100.0470371	99.77440453	99.50326273	99.23359942	98.96540249	98.69865993	98.4333599	98.16949067
221031A00042	10/31/2022	4.73	10/30/2026	10/31/2022	116.0648	111.9211576	107.9529517	104.1517925	100.5097357	97.01925774	93.67323127	90.46490219	87.387868
081215A00091	12/15/2008	4.19	12/15/2023	12/15/2008	103.66062	102.5299956	101.4241104	100.3421604	99.28337356	98.24701047	97.23236307	96.23875286	95.26552934
140113A00012	1/13/2014	3.48	1/17/2023	1/13/2014	100.67749	100.4609331	100.2453184	100.0306415	99.81689622	99.60407653	99.39217633	99.18118962	98.97111046
170728A00032	7/28/2017	2.36	7/27/2023	7/28/2017	101.0227	100.2850938	99.55823513	98.84188999	98.13583146	97.43983916	96.75369897	96.07720279	95.41014836
171120A00017	11/20/2017	2.41	11/21/2022	11/20/2017	100.14502	100.0867309	100.0285259	99.97040161	99.91235796	99.85439477	99.79651186	99.73870907	99.68098623
190910A00004	9/11/2019	1.86	9/11/2024	9/11/2019	101.6735	99.84259978	98.0534078	96.30473119	94.59542048	92.92436605	91.29049649	89.69277702	88.13020798
220729A00035	8/3/2022	3.14	8/3/2027	8/3/2022	111.83094	107.0255663	102.4576537	98.11414718	93.98278761	90.05205487	86.31111896	82.74979458	79.35849893
190424A00007	4/24/2019	2.66	4/24/2024	4/24/2019	102.42764	100.9598984	99.52052688	98.10877949	96.7239313	95.36528223	94.03215604	92.72389925	91.43988021
190930A00008	9/30/2019	1.9	10/10/2023	9/30/2019	100.79835	99.86164203	98.94228284	98.03979535	97.15371829	96.28360711	95.42903317	94.58958306	93.76485793

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210621A00008	6/21/2021	1.04	6/23/2025	6/21/2021	100.43548	97.87007604	95.38246019	92.96979386	90.62936258	88.35856925	86.15492812	84.01605916	81.93968276
170322A00026	3/22/2017	3.22	3/22/2028	3/22/2017	113.75379	108.2822364	103.11208	98.22512984	93.60438534	89.23395072	85.09895774	81.18549437	77.48053857
180426A00053	4/26/2018	2.94	4/26/2023	4/26/2018	101.10247	100.6127899	100.1278542	99.64759071	99.1719322	98.70081261	98.23416716	97.77193229	97.31404565
180622A00005	6/22/2018	3.5	7/2/2029	6/22/2018	118.08601	111.2476291	104.8614414	98.89499882	93.31834966	88.10383573	83.22590474	78.66093917	74.38709988
190426A00009	4/26/2019	2.63	4/26/2024	4/26/2019	102.3921	100.9192588	99.47499043	98.05853731	96.66916702	95.30617238	93.96887034	92.65660092	91.3687263
190724A00021	7/24/2019	2.33	7/23/2027	7/24/2019	108.62369	103.9010825	99.41216119	95.1440827	91.08478627	87.22293805	83.54788294	80.04959984	76.71866026
200203A00001	2/3/2020	1.7	2/3/2023	2/3/2020	100.33116	100.0683276	99.8068668	99.54677024	99.28802731	99.03062749	98.77456035	98.51981559	98.26638298
200212A00003	2/12/2020	1.63	2/12/2025	2/12/2020	101.94988	99.70398267	97.51833315	95.39092758	93.31984213	91.30323084	89.33932184	87.42641373	85.56287221
200406A00006	4/6/2020	1.13	4/7/2025	4/6/2020	100.57669	98.20997216	95.91047493	93.6759204	91.50411949	89.39296996	87.34045238	85.34462639	83.40362711
200511A00020	5/11/2020	1.4	2/1/2028	5/11/2020	103.93457	98.85279763	94.0481151	89.50396022	85.20485436	81.13632215	77.2848208	73.63767467	70.18301493
201028A00003	10/30/2020	1.42	2/27/2026	10/30/2020	102.07846	98.84121556	95.72293737	92.71865579	89.82363453	87.0333585	84.34352231	81.75001945	79.24893202
211103A00007	11/3/2021	0.52	1/4/2023	11/3/2021	100.04743	99.86764537	99.68851076	99.51002188	99.33217523	99.15496734	98.97839478	98.80245412	98.62714198
220601A00022	6/1/2022	2.73	12/1/2023	6/1/2022	101.81341	100.733005	99.67548699	98.64013439	97.62625578	96.63318822	95.66029582	94.70696834	93.77261995
130107A00002	1/7/2013	3.22	1/18/2028	1/7/2013	113.34707	108.0587841	103.0532726	98.31385346	93.82491986	89.57186612	85.5410179	81.71956744	78.09551384
130508A00013	5/8/2013	2.23	5/15/2023	5/8/2013	100.80504	100.2645457	99.72985121	99.20085989	98.67748065	98.15962436	97.64720376	97.14013344	96.63832977
151002A00081	10/2/2015	2.29	10/2/2023	10/2/2015	101.23641	100.3174981	99.41521708	98.52912128	97.65877821	96.80377069	95.96369616	95.13816603	94.3268051
170613A00033	6/13/2017	2.3	6/13/2024	6/13/2017	102.29586	100.6929321	99.12274605	97.58436691	96.07689262	94.59945512	93.15121871	91.73137852	90.33915908
171204A00020	12/4/2017	2.48	12/5/2022	12/4/2017	100.23803	100.1409254	100.0440207	99.94731093	99.85079535	99.75447339	99.65834447	99.56240799	99.46666335
180511A00035	5/11/2018	2.93	5/11/2023	5/11/2018	101.16711	100.6363724	100.1112059	99.59152516	99.0772443	98.5682793	98.06454789	97.56596948	97.07246512
220823A00056	8/23/2022	3.5	8/23/2024	8/23/2022	104.83212	103.0175934	101.243342	99.50821205	97.81108742	96.1508922	94.52658879	92.93717625	91.38168871
180627A00027	6/27/2018	2.87	6/27/2023	6/27/2018	101.33825	100.6794172	100.0291449	99.38726295	98.75360969	98.12802761	97.5103632	96.90046681	96.29819254
190328A00083	3/28/2019	2.37	3/28/2024	3/28/2019	102.06046	100.6651048	99.29549231	97.95097199	96.63091496	95.33471291	94.06177726	92.81153833	91.58344466
190910A00030	9/10/2019	1.86	9/10/2024	9/10/2019	101.66994	99.84174086	98.05513567	96.30893397	94.60199098	92.93320155	91.30149852	89.70585116	88.14526371
200330A00045	3/30/2020	1.47	3/30/2027	3/30/2020	103.6066	99.31625885	95.22695021	91.32825269	87.61033669	84.06392847	80.6802759	77.45111649	74.36864756
210128A00010	1/28/2021	0.57	7/9/2024	1/28/2021	99.267628	97.62523398	96.01741298	94.443138	92.90142254	91.39131891	89.91191632	88.46233902	87.04174464
220602A00039	6/2/2022	3.11	6/2/2027	6/2/2022	111.91047	107.2486952	102.8108065	98.58483846	94.55953214	90.72428757	87.06912156	83.58462841	80.26194334
051107A00075	11/7/2005	5.29	11/17/2025	11/7/2005	113.97544	110.8155591	107.7622382	104.8112719	101.958643	99.20051616	96.5332288	93.95328213	91.45733279
180327A00024	3/27/2018	2.79	5/26/2023	3/27/2018	101.15579	100.5842947	100.0192552	99.46055995	98.90810236	98.36177835	97.82148615	97.28712618	96.75860108
200311A00056	3/13/2020	1.27	4/10/2024	3/13/2020	100.34285	98.92852881	97.54090205	96.17927893	94.84299376	93.53140312	92.24388487	90.97983731	89.73867832
180716A00016	7/16/2018	3.03	7/14/2023	7/16/2018	101.46236	100.7579467	100.0633185	99.37826841	98.70259904	98.03611845	97.37863987	96.7299816	96.0899668
190110A00005	1/10/2019	3.2	1/9/2026	1/10/2019	107.59211	104.3990526	101.318243	98.34506489	95.47512287	92.70423012	90.02839692	87.44381997	84.94687233
191204A00013	12/4/2019	1.72	12/4/2024	12/4/2019	101.93233	99.87201554	97.8633497	95.90469252	93.9944681	92.13116222	90.31331945	88.53954035	86.80847884
210924A00003	9/24/2021	2.37	9/24/2036	9/24/2021	113.40996	100.5831597	89.38762797	79.60510786	71.04764062	63.55322545	56.98211801	51.21367243	46.1436447

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170822A00018	8/22/2017	2.25	8/22/2023	8/22/2017	100.99925	100.1921736	99.39796912	98.61632952	97.8469583	97.08956822	96.34388091	95.6096266	94.88654376
190318A00008	3/18/2019	2.76	3/18/2024	3/18/2019	102.40147	101.0323847	99.68809365	98.36798312	97.07145724	95.79793921	94.54687062	93.31771068	92.10993557
190531A00038	5/31/2019	2.82	5/31/2034	5/31/2019	119.25636	107.8427225	97.66264018	88.5749668	80.45542641	73.1945157	66.69567927	60.87371833	55.65340221
190604A00031	6/4/2019	2.25	6/5/2023	6/4/2019	100.81858	100.2217671	99.63201054	99.04918156	98.47315863	97.90382303	97.34105877	96.78475254	96.23479363
190712A00001	7/12/2019	2.05	7/12/2024	7/12/2019	102.01239	100.3342678	98.69158495	97.08328497	95.50835205	93.96581056	92.45472309	90.97418855	89.52334033
191230A00031	12/30/2019	1.85	12/30/2024	12/30/2019	102.29587	100.1637353	98.08628776	96.06173791	94.08837228	92.16454694	90.28868398	88.45926828	86.67484445
200128A00028	1/28/2020	1.81	1/28/2025	1/28/2020	102.01292	99.81443318	97.67384494	95.58920156	93.55863594	91.5803595	89.65265821	87.77388865	85.94247452
200407A00001	4/8/2020	2.41	4/7/2025	4/8/2020	103.69894	101.2936144	98.95635487	96.68485347	94.47689673	92.33035897	90.24319821	88.21345238	86.2392357
200415A00030	4/15/2020	0.76	3/15/2023	4/15/2020	100.04877	99.67687635	99.30774871	98.94135852	98.57767532	98.2166691	97.85831027	97.50256972	97.14941874
201028A00005	10/30/2020	1.85	10/31/2025	10/30/2020	103.01025	100.0733623	97.2355788	94.49301465	91.84196054	89.27887306	86.80036631	84.40320388	82.0842914
201030A00002	11/2/2020	2.8	10/29/2040	11/2/2020	118.55319	102.4202235	88.82173162	77.33791166	67.62088684	59.38204745	52.38167122	46.42040602	41.33227301
220701A00014	7/1/2022	3.15	7/14/2023	7/1/2022	101.54744	100.8426923	100.147732	99.46235288	98.78635774	98.1195545	97.46175638	96.81278162	96.17245332
150105A00026	1/5/2015	2.54	1/5/2024	1/5/2015	101.88993	100.7140413	99.56523419	98.44257668	97.34518348	96.27220885	95.22284444	94.19631722	93.19188761
160705A00104	7/5/2016	2.1	7/6/2026	7/5/2016	104.99214	101.3685702	97.88956481	94.54854209	91.33926249	88.25580655	85.29255635	82.44417821	79.70560644
180816A00024	8/16/2018	3.01	8/16/2023	8/16/2018	101.59183	100.7982051	100.0169804	99.24786341	98.49057402	97.74484062	97.01039992	96.28699655	95.57438281
190115A00063	1/15/2019	2.96	1/16/2024	1/15/2019	102.32008	101.114242	99.93680533	98.78677752	97.66320914	96.56519416	95.4918675	94.44240278	93.41601015
190212A00017	2/12/2019	2.86	6/30/2023	2/12/2019	101.28445	100.6184814	99.96125208	99.31259139	98.67233271	98.04031365	97.416376	96.80036559	96.19213212
190709A00018	7/9/2019	2.24	7/9/2024	7/9/2019	102.10418	100.43693	98.80469866	97.20644979	95.6411849	94.10794479	92.60580757	91.13388684	89.69132991
210201A00012	2/3/2021	0.75	11/17/2025	2/3/2021	99.727607	96.79570392	93.96429355	91.22937997	88.58715036	86.03396522	83.56634932	81.18098329	78.87469562
220118A00009	1/18/2022	1.65	1/17/2025	1/18/2022	101.6257	99.46000879	97.35077777	95.29612471	93.29424883	91.34342409	89.44199532	87.58837469	85.78103836
190520A00007	5/20/2019	2.52	5/20/2024	5/20/2019	102.33937	100.8035817	99.29835176	97.82284052	96.37623554	94.9577536	93.5666394	92.20216433	90.86362523
200326A00030	3/26/2020	1.13	3/24/2023	3/26/2020	100.18484	99.78806443	99.3944305	99.0038996	98.61643509	98.23200094	97.85056168	97.47208237	97.09652864
210428A00015	4/28/2021	2.02	4/28/2031	4/28/2021	108.70314	100.5364955	93.04869533	86.17971556	79.8751254	74.08554191	68.76613866	63.87620429	59.37874597
150601A00470	6/1/2015	2.98	5/31/2024	6/1/2015	103.24568	101.6703202	100.1266693	98.61383261	97.13095332	95.67720607	94.25179557	92.85395519	91.48294563
171018A00003	10/18/2017	2.23	10/18/2023	10/18/2017	101.23122	100.2696424	99.32628251	98.40063064	97.49219151	96.6004882	95.72506124	94.8654679	94.02128134
180207A00002	2/7/2018	3.13	2/6/2026	2/7/2018	107.58195	104.3139874	101.1632548	98.12485493	95.19412905	92.36664186	89.6381692	87.00468646	84.46235775
190826A00063	8/26/2019	2.05	8/28/2028	8/26/2019	107.91075	102.1867444	96.80299388	91.73755315	86.96999882	82.48131643	78.25379641	74.27093832	70.51736265
190923A00081	9/23/2019	1.96	9/20/2024	9/23/2019	101.89533	100.0382601	98.22398841	96.45127871	94.71893793	93.02581497	91.37079881	89.75281693	88.17083367
191113A00016	11/15/2019	2.02	8/15/2024	11/15/2019	101.86884	100.1071714	98.38424354	96.69891715	95.0500991	93.43673732	91.8578189	90.31236824	88.79944533
200225A00012	2/25/2020	1.57	2/25/2025	2/25/2020	101.55879	99.28624834	97.0754833	94.92447662	92.83128643	90.79404553	88.81095805	86.88029627	85.00039762
100824A00009	8/24/2010	3.91	9/2/2025	8/24/2010	108.66037	105.7956046	103.0220295	100.3362648	97.73507171	95.21534822	92.77412274	90.40854789	88.1158946
170215A00041	2/15/2017	2.6	10/16/2023	2/15/2017	101.48767	100.531431	99.59318448	98.67242689	97.76867234	96.88145282	96.01031734	95.1548312	94.31457524
180820A00054	8/20/2018	3	8/18/2023	8/20/2018	101.59307	100.7940783	100.0076467	99.2334845	98.47130599	97.7208342	96.98180066	96.25394508	95.537015

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190523A00016	5/23/2019	2.48	2/15/2023	5/23/2019	100.58674	100.2904155	99.99584317	99.70300777	99.41189393	99.12248643	98.83477026	98.54873057	98.26435269
190904A00020	9/4/2019	1.69	9/1/2023	9/4/2019	100.55231	99.7205566	98.90250431	98.09781623	97.30616714	96.52724231	95.76073706	95.00635635	94.26381443
200720A00039	7/22/2020	2.48	7/21/2025	7/22/2020	104.38666	101.6950149	99.08644249	96.55784104	94.10624865	91.72883522	89.42289552	87.18584258	85.01520158
170731A00029	7/31/2017	2.34	7/31/2023	7/31/2017	101.01847	100.2701432	99.53287334	98.80641414	98.09052926	97.38498925	96.68957121	96.00405863	95.32824111
180920A00028	9/20/2018	3.12	9/20/2023	9/20/2018	101.94362	101.0533141	100.178554	99.31893687	98.47407181	97.64358111	96.82709989	96.02427558	95.23476731
180920A00062	9/20/2018	3.12	9/20/2023	9/20/2018	101.94362	101.0533141	100.178554	99.31893687	98.47407181	97.64358111	96.82709989	96.02427558	95.23476731
180924A00052	9/24/2018	3.22	9/22/2023	9/24/2018	101.95523	101.060737	100.1819354	99.31841742	98.46978666	97.63566027	96.81566843	96.00945382	95.21667107
190809A00011	8/9/2019	1.69	8/9/2024	8/9/2019	101.48637	99.73977918	98.03137999	96.36002859	94.72462932	93.12412914	91.55751557	90.02381471	88.52208934
191120A00005	11/20/2019	2.63	11/20/2034	11/20/2019	115.8068	104.2909747	94.06508778	84.97646545	76.89127176	69.69209935	63.2758773	57.55205461	52.44102181
191217A00012	12/20/2019	2.03	12/20/2024	12/20/2019	102.3712	100.2697473	98.22161375	96.22507814	94.27848914	92.38026139	90.52887225	88.72285883	86.96081511
200204A00020	2/4/2020	1.6	2/4/2025	2/4/2020	101.85177	99.63003971	97.46737839	95.36179438	93.31138352	91.31432104	89.36885754	87.47331515	85.62608393
200226A00009	2/26/2020	1.75	2/26/2030	2/26/2020	107.69275	100.5533639	93.93631582	87.80074968	82.10920204	76.82730046	71.92349426	67.36881001	63.13662923
150601A00689	6/1/2015	2.81	2/28/2025	6/1/2015	104.36749	102.0531121	99.80166431	97.61109344	95.47942963	93.40477783	91.38531462	89.41928501	87.50499955
160329A00006	3/29/2016	2.12	3/29/2023	3/29/2016	100.5927	100.1812728	99.77320726	99.36845779	98.9669841	98.56874659	98.17370628	97.78182483	97.39306451
160701A00039	7/1/2016	1.92	7/1/2026	7/1/2016	104.78785	101.1681933	97.69283306	94.35521391	91.14911517	88.0686347	85.1081705	82.26240349	79.52628137
170728A00033	7/28/2017	2.46	1/29/2024	7/28/2017	101.76261	100.5259925	99.31934607	98.14159114	96.99169953	95.86869127	94.7716319	93.69962979	92.65183377
190327A00031	3/27/2019	2.53	3/27/2024	3/27/2019	102.11528	100.7248356	99.35996192	98.02001319	96.70436654	95.41241932	94.14358839	92.89730928	91.67303546
191004A00012	10/4/2019	1.78	10/4/2024	10/4/2019	101.59872	99.70759442	97.86086859	96.05723889	94.29544543	92.57427342	90.89255125	89.24914869	87.64297507
200127A00013	1/27/2020	1.56	1/27/2023	1/27/2020	100.30831	100.06449	99.82185494	99.58039965	99.34011551	99.10099402	98.86302675	98.62620533	98.39052151
200205A00011	2/7/2020	2.31	2/7/2024	2/7/2020	101.61813	100.3588613	99.12807506	97.92480546	96.74812937	95.59716489	94.47106901	93.36903549	92.29029285
200214A00007	2/14/2020	1.59	2/14/2025	2/14/2020	101.8653	99.61463014	97.42448379	95.29284857	93.21779634	91.19747643	89.23011192	87.31399606	85.44748899
200226A00025	2/26/2020	1.38	2/26/2025	2/26/2020	101.41865	99.13876663	96.92105608	94.76348348	92.66409333	90.62100516	88.63241023	86.69656832	84.8118047
200429A00050	5/1/2020	2.61	4/30/2025	5/1/2020	104.30629	101.8320575	99.42952918	97.09621121	94.8297154	92.62775085	90.48811934	88.40871095	86.38749996
180118A00004	1/18/2018	2.88	1/17/2025	1/18/2018	104.35847	102.1618868	100.0223939	97.93809583	95.90717393	93.92788495	91.99855718	90.11758686	88.28343477
180730A00004	7/30/2018	3.14	7/28/2023	7/30/2018	101.60856	100.8658496	100.1339911	99.41274482	98.70188104	98.00117673	97.3104152	96.62938585	95.95788401
181227A00027	12/27/2018	3.24	12/26/2025	12/27/2018	107.61259	104.4559814	101.4092644	98.46797044	95.62783823	92.88480607	90.23500125	87.67472989	85.20046746
200203A00005	2/3/2020	1.7	5/3/2023	2/3/2020	100.45708	99.95077898	99.44956525	98.95336414	98.46210077	97.97570173	97.49409508	97.01721027	96.54497814
200221A00013	2/21/2020	1.69	2/21/2025	2/21/2020	101.82409	99.55986065	97.35688829	95.2131616	93.12674707	91.0957867	89.11849449	87.19315322	85.31811125
200922A00039	9/24/2020	3	9/23/2025	9/24/2020	106.21494	103.3287935	100.5365037	97.83452363	95.21945686	92.68805328	90.23720212	87.86392516	85.5653703
190522A00019	5/23/2019	2.55	5/15/2024	5/23/2019	102.3468	100.824355	99.33205818	97.86908858	96.43465044	95.02797642	93.64832625	92.2949856	90.96726487
190524A00026	5/28/2019	2.45	6/15/2023	5/28/2019	100.96713	100.342803	99.72618648	99.11714252	98.51553208	97.92121954	97.33407253	96.75396191	96.18076161
200224A00029	2/24/2020	1.56	2/24/2023	2/24/2020	100.32918	100.0086232	99.6901087	99.37362053	99.05913943	98.74664637	98.43612256	98.12754944	97.82090869
140131A00025	1/31/2014	3.28	1/30/2023	1/31/2014	100.72271	100.4702098	100.2189758	99.96899414	99.72025562	99.472751	99.22647115	98.98140705	98.73754976

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160727A00002	7/27/2016	1.87	7/27/2023	7/27/2016	100.65772	99.9216177	99.19624478	98.48137015	97.77676718	97.08221576	96.397502	95.72241806	95.0567619
171030A00023	10/30/2017	2.9	11/1/2027	10/30/2017	111.24166	106.2131948	101.4451735	96.92272724	92.63191226	88.55964804	84.69365941	81.02242279	77.53511638
180529A00043	5/29/2018	2.99	5/30/2023	5/29/2018	101.23751	100.6555266	100.0802239	99.5114861	98.94920136	98.39326037	97.84355628	97.29998461	96.76244323
190522A00017	5/23/2019	2.53	3/1/2023	5/23/2019	100.66155	100.3265922	99.99386187	99.66333209	99.33498115	99.00878759	98.68473026	98.36278826	98.04294098
190710A00022	7/10/2019	2.22	7/10/2024	7/10/2019	102.07447	100.4048695	98.77037976	97.16996034	95.60260878	94.06736213	92.56329496	91.08951751	89.64517392
190910A00017	9/16/2019	1.86	9/16/2024	9/16/2019	101.69131	99.8468972	98.04477575	96.28373095	94.5625898	92.88022018	91.23552928	89.62746188	88.05499886
191114A00009	11/18/2019	1.94	8/16/2023	11/18/2019	100.73593	99.9460642	99.16855504	98.40311296	97.64945852	96.90732088	96.17643744	95.45655354	94.74742214
200429A00003	4/29/2020	0.74	4/28/2023	4/29/2020	99.975479	99.48413238	98.99759409	98.51579404	98.03866337	97.56613453	97.09814127	96.63461861	96.17550282
170622A00037	6/22/2017	3.27	6/22/2033	6/22/2017	121.47003	110.8419031	101.2727674	92.65035258	84.87487316	77.85757849	71.51948005	65.7902312	60.6071406
181114A00021	11/14/2018	3.17	11/14/2023	11/14/2018	102.30816	101.2685943	100.2501555	99.25220288	98.27412235	97.31532419	96.37524182	95.45333067	94.54906716
190828A00019	8/28/2019	2	3/28/2028	8/28/2019	107.2376	101.9236172	96.90581656	92.16619489	87.68793064	83.45530136	79.45360655	75.6690963	72.08890528
191106A00012	11/6/2019	2.02	10/11/2024	11/6/2019	102.0881	100.1740484	98.30533898	96.4806195	94.69859182	92.95800473	91.25765196	89.59637025	87.97303753
211222A00018	12/22/2021	0.88	7/17/2023	12/22/2021	99.933905	99.22750194	98.5310442	97.84432311	97.16713554	96.49928398	95.84057635	95.19082581	94.54985057
221014A00043	10/14/2022	4.49	10/14/2027	10/14/2022	119.71678	114.5045971	109.5576285	104.8609199	100.4004422	96.16302559	92.13630229	88.30865355	84.66916055
190904A00019	9/4/2019	1.69	9/4/2024	9/4/2019	101.33337	99.52440169	97.75626729	96.0278132	94.33792407	92.68552279	91.06956896	89.48905742	87.94301679
200224A00015	2/24/2020	1.57	1/10/2024	2/24/2020	100.61451	99.43544478	98.28386178	97.15881088	96.05938361	94.98471255	93.93396903	92.90636103	91.9011311
200604A00014	6/4/2020	2.42	6/4/2040	6/4/2020	112.63199	97.24188334	84.24515324	73.25094037	63.93431794	56.02487096	49.29730051	43.56368688	38.66711216
210604A00005	6/4/2021	0.3	12/2/2022	6/4/2021	100.03839	99.94966997	99.86110822	99.77270641	99.68446411	99.59638088	99.50845629	99.42068991	99.33308131
180625A00041	6/25/2018	3.06	6/20/2023	6/25/2018	101.37339	100.7340967	100.1028632	99.47954052	98.86398039	98.25603832	97.65557338	97.06244811	96.47652838
181023A00021	10/23/2018	3.28	10/23/2023	10/23/2018	102.17641	101.1980162	100.2383581	99.29690545	98.37314334	97.46657618	96.57672675	95.70313535	94.84535899
190122A00007	1/22/2019	3.03	1/22/2024	1/22/2019	102.43913	101.2165997	100.0232359	98.85800332	97.71991534	96.60803095	95.52145223	94.45932188	93.42082098
200303A00034	3/3/2020	1.21	3/3/2025	3/3/2020	100.73074	98.45180038	96.23527785	94.07912977	91.98139377	89.94018232	87.95367946	86.02013762	84.1378747
200810A00004	8/10/2020	0.43	8/9/2024	8/10/2020	99.236927	97.5110118	95.82290438	94.1714744	92.55563644	90.97434734	89.4266041	87.91144196	86.42793254
170123A00039	1/23/2017	2.79	1/23/2026	1/23/2017	106.80076	103.5734463	100.4610434	97.45876747	94.56206455	91.76659975	89.06824516	86.46306843	83.94732201
190626A00010	6/26/2019	2.1	6/26/2023	6/26/2019	100.76748	100.1142086	99.46938785	98.8328526	98.20444397	97.58400711	96.97139107	96.36644868	95.76903645
190808A00023	8/8/2019	1.68	11/8/2023	8/8/2019	100.73405	99.71925757	98.72481629	97.75012225	96.79459185	95.8576643	94.9388005	94.03748199	93.15321001
150601A00650	6/1/2015	2.75	3/31/2023	6/1/2015	100.84576	100.4282424	100.0141708	99.60350299	99.19619718	98.79221232	98.39150797	97.9940444	97.59978246
180110A00028	1/10/2018	2.85	1/10/2025	1/10/2018	104.25182	102.0747492	99.953889	97.8873863	95.87346344	93.91041574	91.99660789	90.1304704	88.31049644
180719A00063	7/19/2018	3.21	7/19/2024	7/19/2018	103.83863	102.1295411	100.456741	98.81913643	97.21567965	95.64536478	94.10722568	92.60033399	91.12379721
190606A00026	6/6/2019	2.23	6/6/2023	6/6/2019	100.80877	100.2092913	99.6169321	99.0315637	98.45306283	97.88130911	97.31618495	96.75757549	96.20536854
190711A00022	7/11/2019	2	7/11/2023	7/11/2019	100.78913	100.0946329	99.40969035	98.73410514	98.06768631	97.41024811	96.76160976	96.12159533	95.49003354
190830A00002	8/30/2019	1.93	8/28/2026	8/30/2019	104.61384	100.8607858	97.26260371	93.81211699	90.50252171	87.32736211	84.28051101	81.35615139	78.54875906
190930A00035	9/30/2019	1.93	9/30/2024	9/30/2019	101.87593	99.99236988	98.15278787	96.35589663	94.60045504	92.88526618	91.20917542	89.57106862	87.96987047

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191105A00007	11/5/2019	1.98	11/5/2026	11/5/2019	105.66485	101.6972462	97.90089055	94.26749564	90.78921778	87.45863269	84.26871084	81.2127942	78.28457464
200709A00002	7/10/2020	1.66	7/10/2025	7/10/2020	102.12403	99.49172645	96.94016407	94.46635895	92.06745508	89.74072213	87.48354895	85.29343737	83.16799641
220317A00012	3/17/2022	1.99	9/15/2023	3/17/2022	100.83257	99.96220071	99.10681461	98.26602713	97.43946686	96.62677486	95.82760421	95.04161947	94.26849622
170608A00020	6/8/2017	2.27	6/10/2024	6/8/2017	102.2321	100.6378699	99.0760994	97.54586434	96.04627431	94.57647228	93.13563296	91.72296138	90.33769143
180223A00022	2/23/2018	2.93	2/23/2023	2/23/2018	100.76508	100.4463772	100.12969	99.8150005	99.50228977	99.19153921	98.88273041	98.57584523	98.27086571
190702A00002	7/2/2019	2.16	7/2/2024	7/2/2019	101.95624	100.3082623	98.69462532	97.11431489	95.56636121	94.04983226	92.56383182	91.10749779	89.68000049
200304A00053	3/6/2020	2.33	3/6/2025	3/6/2020	103.36867	101.0505922	98.79600045	96.60281834	94.46904561	92.3927586	90.37210676	88.40530953	86.49065321
220830A00055	8/30/2022	3.7	8/30/2029	8/30/2022	119.7431	112.6963497	106.1244547	99.99277208	94.26936189	88.92475966	83.93177279	79.26529467	74.90213484
160630A00012	6/30/2016	2.11	6/30/2025	6/30/2016	103.29814	100.6756976	98.1329229	95.66690055	93.27483855	90.95406635	88.70202866	86.51627951	84.39447681
200123A00013	1/27/2020	1.89	1/27/2025	1/27/2020	102.18995	99.99202325	97.85191129	95.76766799	93.73743088	91.75941578	89.8319127	87.95328208	86.1219512
200928A00002	9/28/2020	0.35	9/28/2023	9/28/2020	99.441449	98.54212937	97.65894747	96.79147289	95.93929009	95.1019981	94.27920982	93.47055147	92.67566201
160119A00030	1/19/2016	3.44	1/18/2033	1/19/2016	122.63929	112.3313062	103.0122426	94.58093774	86.94710817	80.0301244	73.75793164	68.06609646	62.8969639
170803A00020	8/3/2017	2.84	8/3/2027	8/3/2017	110.41173	105.6396889	101.103914	96.7914039	92.68994978	88.78807918	85.07500734	81.5405919	78.17529083
211222A00022	12/22/2021	1.06	1/16/2024	12/22/2021	100.00189	98.81097732	97.6482282	96.51264968	95.40329874	94.31927554	93.25972099	92.22381445	91.21077159
170327A00072	3/29/2017	3.09	3/29/2027	3/29/2017	111.30968	106.8361598	102.5703825	98.50161692	94.61974365	90.91521436	87.37901689	84.00264232	80.77805434
180116A00010	1/16/2018	2.58	1/17/2023	1/16/2018	100.48256	100.2663048	100.05099	99.83661195	99.62316453	99.41064165	99.19903724	98.98834532	98.77855993
180719A00065	7/19/2018	3.36	7/20/2026	7/19/2018	109.73647	105.9889227	102.391225	98.93651978	95.61830366	92.43040974	89.36698783	86.42248608	83.59163379
190430A00003	4/30/2019	2.43	8/2/2023	4/30/2019	101.16026	100.4050873	99.66116146	98.92823487	98.20606499	97.49441635	96.7930603	96.10177477	95.42034405
150601A00733	6/1/2015	2.72	5/1/2025	6/1/2015	104.8138	102.3236092	99.90572923	97.55763858	95.27692349	93.06126885	90.90845345	88.81634557	86.78289879
151109A00020	11/9/2015	2.79	11/9/2023	11/9/2015	101.77184	100.75026	99.74916308	98.76793917	97.80600053	96.86278246	95.9377421	95.03035742	94.14012624
191206A00044	12/10/2019	2.01	10/31/2024	12/10/2019	102.13877	100.1726565	98.25433338	96.38233843	94.55526819	92.77177149	91.03054706	89.3303413	87.66994624
200114A00006	1/15/2020	1.99	1/15/2025	1/15/2020	102.37435	100.2053763	98.09279083	96.03472095	94.02937243	92.07502533	90.17003017	88.31280435	86.50182888
200220A00025	2/20/2020	1.72	2/21/2023	2/20/2020	100.37511	100.0626926	99.75221777	99.44367141	99.13703558	98.83229254	98.52942481	98.22841508	97.92924628
200318A00043	3/18/2020	1.06	3/20/2023	3/18/2020	100.19344	99.80716933	99.42387732	99.04353307	98.66610256	98.29155231	97.91984934	97.55096118	97.18485585
200925A00008	9/25/2020	0.74	9/25/2025	9/25/2020	99.667367	96.87159705	94.16768039	91.55212437	89.02158802	86.57287492	84.2029261	81.90881339	79.68773303
210608A00005	6/8/2021	0.51	6/7/2024	6/8/2021	99.378502	97.81626693	96.28579666	94.78618918	93.31657658	91.87612331	90.46402462	89.07950514	87.72181751
221031A00004	10/31/2022	4.79	10/28/2025	10/31/2022	111.79794	108.7363797	105.7767267	102.9150141	100.1474556	97.47043365	94.88049028	92.37431964	89.94876008
120113A00013	1/13/2012	3.87	1/15/2032	1/13/2012	125.25031	115.7371374	107.0537241	99.12248258	91.87349151	85.24369781	79.17620813	73.61965671	68.52764119
170623A00028	6/23/2017	2.79	6/23/2027	6/23/2017	109.96909	105.3132958	100.8835373	96.66761411	92.65405358	88.83206158	85.19147854	81.72273852	78.41683118
180103A00019	1/3/2018	2.51	1/3/2023	1/3/2018	100.40198	100.2244839	100.0476146	99.87137112	99.69575025	99.52074869	99.34636317	99.17259044	98.99942728
190122A00045	1/22/2019	3.17	1/22/2027	1/22/2019	111.09871	106.8124106	102.7176424	98.80476182	95.064671	91.48878127	88.0689813	84.79760756	81.66741681
190326A00024	3/26/2019	2.59	3/26/2024	3/26/2019	102.19626	100.8078263	99.44487824	98.10677803	96.79290563	95.50266117	94.23546413	92.99075253	91.76798226
200224A00020	2/24/2020	1.59	2/24/2025	2/24/2020	101.60211	99.33191369	97.12335966	94.97443013	92.88318548	90.84776101	88.86636348	86.93726796	85.05881476

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200302A00035	3/2/2020	1.22	7/3/2023	3/2/2020	100.1837	99.51380736	98.85283224	98.20059976	97.55693747	96.92167738	96.2946559	95.67571365	95.06469533
220916A00042	9/16/2022	4.07	9/16/2030	9/16/2022	125.78385	117.4565869	109.7635037	102.6525463	96.07619636	89.99105509	84.35746677	79.13917808	74.30303008
150601A00522	6/1/2015	4.52	7/25/2030	6/1/2015	127.22344	119.0339849	111.4548367	104.4367742	97.93480989	91.90780417	86.31811662	81.13129023	76.31576597
170216A00044	2/16/2017	3.52	2/17/2032	2/16/2017	122.22521	112.7616898	104.1342264	96.26385235	89.07946434	82.51700047	76.51870923	71.03249795	66.01135143
180116A00046	1/16/2018	2.58	1/11/2023	1/16/2018	100.45336	100.2537006	100.0548469	99.85679318	99.65953465	99.46306645	99.26738379	99.07248192	98.87835611
180917A00054	9/17/2018	3.17	9/15/2023	9/17/2018	101.87388	100.9985193	100.1382015	99.29254148	98.46116661	97.64371682	96.83984407	96.04921183	95.27149462
190827A00001	8/27/2019	1.74	8/27/2024	8/27/2019	101.4011	99.6125531	97.86395697	96.15417696	94.48211761	92.84672176	91.24696896	89.68187389	88.15048496
191212A00029	12/13/2019	1.94	5/16/2023	12/13/2019	100.60065	100.0586823	99.52254549	98.99214992	98.4674036	97.94821651	97.43450052	96.92616937	96.42313859
200228A00063	2/28/2020	1.32	2/28/2023	2/28/2020	100.25493	99.92356161	99.59437365	99.26734429	98.94245243	98.61967724	98.29899816	97.9803949	97.66384741
150422A00019	4/22/2015	2.62	4/22/2025	4/22/2015	104.28953	101.8368433	99.45463429	97.14047774	94.89204551	92.70710344	90.58350691	88.51919672	86.51219508
160706A00027	7/6/2016	2.29	7/6/2028	7/6/2016	109.13899	103.5147365	98.21690589	93.22481949	88.51921677	84.08215158	79.89689544	75.94784834	72.22045669
180206A00013	2/6/2018	2.72	2/6/2024	2/6/2018	102.27569	101.012465	99.77812384	98.5716804	97.39218896	96.23874645	95.11048998	94.00659464	92.92627144
180412A00034	4/12/2018	3.23	4/15/2030	4/12/2018	118.63612	110.9818887	103.8882138	97.31089499	91.20944041	85.54673539	80.2887446	75.40424195	70.86456532
180622A00004	6/22/2018	3.47	12/22/2028	6/22/2018	116.80977	110.5231888	104.6235505	99.08489209	93.88312666	88.9959005	84.4024592	80.08352493	76.02118382
190321A00003	3/21/2019	2.67	3/21/2024	3/21/2019	102.28869	100.9126021	99.56156338	98.23495032	96.93215812	95.6526015	94.3957139	93.16094676	91.94776877
190710A00012	7/10/2019	2.18	7/10/2023	7/10/2019	100.8508	100.1595539	99.47776637	98.80524506	98.14180186	97.48725374	96.84142258	96.20413499	95.57522215
200825A00007	8/27/2020	4.79	8/27/2026	8/27/2020	115.51033	111.5524196	107.755407	104.1118929	100.6148554	97.25763089	94.03389387	90.93763796	87.96315811
170524A00011	5/24/2017	2.54	5/24/2024	5/24/2017	102.3742	100.8278765	99.31243355	97.82701454	96.37079402	94.94297643	93.54279473	92.16950917	90.82240602
191025A00013	10/25/2019	1.98	10/25/2024	10/25/2019	102.05791	100.1080836	98.20528577	96.34809637	94.53514438	92.76510938	91.03671934	89.34874847	87.70001521
120112A00014	1/12/2012	3.43	1/15/2032	1/12/2012	122.65703	113.1918903	104.5579863	96.67725933	89.47938477	82.90096897	76.88483212	71.3793688	66.33797736
170822A00020	8/22/2017	2.59	8/22/2025	8/22/2017	104.85255	102.0710898	99.37775828	96.7692728	94.24249346	91.79441537	89.42216198	87.12297877	84.89422727
180619A00020	6/19/2018	3.1	6/19/2025	6/19/2018	106.21086	103.5714847	101.0114735	98.52794607	96.11814636	93.77943684	91.50929265	89.30529584	87.16513005
190806A00027	8/6/2019	1.71	8/7/2023	8/6/2019	100.61853	99.85223011	99.09756467	98.35427085	97.62209305	96.90078329	96.1901009	95.4898123	94.79969068
140815A00030	8/15/2014	2.96	10/16/2023	8/15/2014	101.83604	100.8779858	99.93794817	99.01542292	98.10992361	97.22098171	96.34814576	95.49098061	94.64906663
180904A00014	9/4/2018	3.37	9/1/2028	9/4/2018	115.56271	109.6096753	104.0073891	98.73331943	93.76649688	89.08739423	84.67782068	80.52082393	76.60060003
190814A00010	8/14/2019	1.84	4/5/2023	8/14/2019	100.48766	100.0574124	99.63084245	99.20790414	98.78855124	98.37273829	97.96042057	97.55155414	97.14609578
200204A00001	2/4/2020	1.79	2/4/2025	2/4/2020	101.99149	99.77403193	97.61540624	95.51363827	93.46683433	91.47317956	89.53093392	87.63842836	85.79406135
200626A00015	6/26/2020	0.43	6/26/2023	6/26/2020	99.724611	99.07445533	98.43273259	97.7992796	97.17393741	96.55655114	95.9469698	95.34504622	94.7506369
170130A00008	1/30/2017	2.58	1/30/2023	1/30/2017	100.54584	100.2936456	100.0427086	99.79302289	99.54457911	99.29736809	99.05138072	98.80660798	98.56304093
191220A00002	12/20/2019	3.02	12/20/2038	12/20/2019	122.67462	107.5217274	94.52932326	83.37179521	73.77444098	65.50526514	58.36813474	52.19706184	46.85142269
200131A00048	1/31/2020	1.69	1/31/2024	1/31/2020	100.79956	99.5640499	98.35865413	97.18228349	96.03390012	94.91251511	93.81718563	92.74701228	91.70113661
201030A00003	11/2/2020	2.58	10/29/2040	11/2/2020	114.96105	99.12183944	85.78385521	74.53161896	65.02097134	56.96649789	50.13122758	44.31818129	39.36343063
160119A00026	1/19/2016	3.14	1/19/2029	1/19/2016	114.93399	108.6313758	102.721826	97.1786483	91.97710773	87.09426997	82.50886071	78.2011367	74.15276745

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160726A00005	7/26/2016	2.28	7/27/2026	7/26/2016	105.76978	102.0777053	98.53468706	95.13384957	91.86868056	88.73300693	85.72097477	82.82703064	80.04590411
171116A00021	11/16/2017	2.16	11/16/2022	11/16/2017	100.10339	100.0589507	100.0145637	99.97023244	99.925957	99.88173721	99.83757296	99.79346416	99.74941069
180814A00033	8/14/2018	3.25	8/13/2027	8/14/2018	113.12439	108.2403839	103.5991331	99.18725734	94.99218312	91.00209434	87.20588227	83.59309932	80.15391601
190208A00009	2/8/2019	2.67	2/8/2024	2/8/2019	102.22484	100.9566896	99.71692885	98.50460461	97.31880529	96.15865965	95.02333456	93.91203293	92.82399177
200131A00007	1/31/2020	1.68	1/31/2023	1/31/2020	100.32082	100.0662463	99.81295982	99.56094834	99.31020227	99.06071216	98.81246867	98.56546252	98.31968455
200207A00016	2/7/2020	1.74	2/7/2024	2/7/2020	100.88831	99.63395074	98.40799541	97.20947592	96.0374714	94.8911021	93.76952709	92.67194212	91.59757762
200402A00021	4/2/2020	0.77	10/2/2024	4/2/2020	99.888803	98.01515816	96.18554007	94.39865394	92.65325151	90.94812918	89.28212608	87.65412224	86.06303692
200430A00016	4/30/2020	0.82	4/30/2024	4/30/2020	99.681974	98.21961952	96.78588031	95.37999117	94.00121406	92.64883649	91.32217043	90.02055123	88.74333665
210924A00011	9/24/2021	2.19	9/25/2034	9/24/2021	110.69974	99.59516093	89.72978857	80.95800035	73.15199133	66.19951197	60.00190577	54.47240274	49.53463448
160328A00045	3/28/2016	2.49	3/27/2026	3/28/2016	106.24432	102.8536575	99.58971971	96.44711637	93.42071153	90.5056138	87.69716347	84.99092022	82.38265162
171026A00007	10/26/2017	2.47	10/26/2023	10/26/2017	101.38763	100.4054366	99.44222653	98.49745712	97.5706025	96.66115668	95.76863254	94.89256102	94.03249023
190523A00014	5/23/2019	2.5	11/15/2023	5/23/2019	101.49649	100.4604569	99.44553621	98.45108473	97.47648757	96.52115433	95.58451781	94.66603288	93.76517545
190814A00005	8/14/2019	1.65	8/14/2024	8/14/2019	101.43052	99.67138646	97.950963	96.26811356	94.62174127	93.01079078	91.4342463	89.89112974	88.38049891
190930A00075	9/30/2019	2.19	9/29/2027	9/30/2019	107.58454	102.7302422	98.12441885	93.75309273	89.60313891	85.66223195	81.91879328	78.36194223	74.98145057
160815A00006	8/15/2016	2.23	8/17/2026	8/15/2016	105.698	101.9528142	98.36087386	94.91508692	91.6087326	88.43543679	85.38915202	82.46413883	79.65494824
171129A00020	11/29/2017	2.89	11/30/2026	11/29/2017	108.96901	104.8824247	100.9734048	97.23327551	93.65383279	90.2273166	86.94638422	83.80408546	80.79383937
190404A00003	4/4/2019	2.47	4/4/2024	4/4/2019	102.23188	100.8166264	99.42781118	98.06475516	96.72680484	95.41332837	94.12371465	92.85737251	91.61372985
190925A00004	9/25/2019	1.7	9/24/2024	9/25/2019	101.65944	99.78947632	97.96292004	96.1785086	94.43502404	92.73129146	91.06617725	89.43858736	87.84746557
200214A00014	2/18/2020	1.8	2/18/2025	2/18/2020	102.06753	99.809032	97.6114154	95.47267148	93.39087257	91.3641671	89.39077611	87.46898981	85.59716438
200227A00027	2/27/2020	1.47	2/27/2025	2/27/2020	101.33183	99.05626122	96.8427059	94.68914282	92.59362655	90.55428587	88.56932051	86.63699805	84.75565093
210924A00004	9/24/2021	2.37	9/24/2036	9/24/2021	113.40996	100.5831597	89.38762797	79.60510786	71.04764062	63.55322545	56.98211801	51.21367243	46.1436447
180611A00030	6/11/2018	2.91	6/12/2023	6/11/2018	101.29954	100.6814454	100.0708997	99.46776023	98.87189271	98.28316596	97.70145199	97.12662588	96.55856561
181018A00011	10/18/2018	3.35	10/18/2023	10/18/2018	102.22539	101.259957	100.3127696	99.38331303	98.4710922	97.57563048	96.69646862	95.83316407	94.98529015
190531A00037	5/31/2019	2.61	5/31/2029	5/31/2019	113.06521	106.4368243	100.2459491	94.46135744	89.05421002	83.99785985	79.26767459	74.84087426	70.69638279
190829A00050	8/29/2019	1.73	8/29/2024	8/29/2019	101.38874	99.59511544	97.84165301	96.12722166	94.45072508	92.81110485	91.20733881	89.63843963	88.10345338
200228A00012	3/3/2020	1.4	3/3/2025	3/3/2020	101.17613	98.89188903	96.67017953	94.5089537	92.40624597	90.36016571	88.36889396	86.4306803	84.54383986
210428A00006	4/28/2021	1.23	4/28/2026	4/28/2021	101.59974	98.21654966	94.96347411	91.83482431	88.82519579	85.92944822	83.14269109	80.46027007	77.87775431
220310A00005	3/10/2022	2.06	3/8/2024	3/10/2022	101.40427	100.0684002	98.75632212	97.46745231	96.20122838	94.95710569	93.73455659	92.53306985	91.35214992
140307A00011	3/7/2014	3.19	3/15/2023	3/7/2014	100.99275	100.6182961	100.2466328	99.87772605	99.51154522	99.14806	98.78724056	98.42905752	98.07348194
160830A00037	8/30/2016	2.16	8/29/2025	8/30/2016	103.67224	100.8893767	98.1953402	95.58682941	93.06068523	90.61388249	88.24352355	85.94683219	83.72114782
190409A00031	4/9/2019	2.64	4/9/2024	4/9/2019	102.32852	100.9018545	99.50204498	98.12839496	96.78023562	95.45692044	94.1578243	92.88234262	91.62989045
190711A00019	7/11/2019	2.19	7/11/2023	7/11/2019	100.86003	100.166061	99.48162395	98.80652539	98.140575	97.48358763	96.8353831	96.19578603	95.56462569
200513A00003	5/13/2020	0.68	5/13/2025	5/13/2020	99.800382	97.34305282	94.95814062	92.64309149	90.39545815	88.21289476	86.09315193	84.03407217	82.03358543

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200818A00004	8/18/2020	0.92	8/18/2026	8/18/2020	100.74213	97.08812304	93.58475502	90.2250365	87.0023392	83.91037708	80.94318662	78.09510845	75.36077003
210601A00002	6/1/2021	0.9	6/2/2025	6/1/2021	100.04659	97.54178062	95.11170535	92.75368634	90.46516162	88.24367743	86.08688284	83.99252469	81.95844284
220429A00007	4/29/2022	3.14	10/29/2024	4/29/2022	104.39625	102.4121629	100.4760647	98.58649559	96.74205064	94.9413771	93.18317203	91.46618012	89.7891916
161215A00014	12/15/2016	2.66	12/15/2022	12/15/2016	100.3156	100.1907397	100.06621	99.94200468	99.81812243	99.69456198	99.57132204	99.44840135	99.32579861
190820A00005	8/21/2019	1.76	2/27/2023	8/21/2019	100.3995	100.0705644	99.74377638	99.41911507	99.09655977	98.77609009	98.45768591	98.14132737	97.82699485
210125A00007	1/27/2021	2.98	1/27/2031	1/27/2021	116.4697	108.2167203	100.6236425	93.63392615	87.19616318	81.26358869	75.7936385	70.747551	66.09000867
160815A00005	8/15/2016	2.23	8/17/2026	8/15/2016	105.698	101.9528142	98.36087386	94.91508692	91.6087326	88.43543679	85.38915202	82.46413883	79.65494824
180130A00070	1/30/2018	3.14	1/29/2027	1/30/2018	110.45709	106.1821687	102.0987392	98.19714136	94.46825781	90.90348293	87.4946907	84.23420493	81.11477155
190215A00046	2/15/2019	2.7	2/15/2024	2/15/2019	102.30971	101.0225598	99.76209638	98.52749161	97.31795389	96.13272417	94.97107424	93.83230516	92.71574577
191114A00008	11/18/2019	1.93	4/17/2023	11/18/2019	100.54726	100.0841745	99.62535694	99.17074587	98.72028355	98.2739133	97.83157943	97.39322729	96.95880319
191206A00021	12/6/2019	2.02	12/6/2024	12/6/2019	102.29977	100.2355381	98.22303517	96.26061524	94.34669934	92.47977037	90.65837017	88.88109672	87.14660152
221026A00032	10/26/2022	4.81	10/25/2024	10/26/2022	107.69833	105.6909985	103.7318174	101.8193277	99.95212808	98.12886902	96.34825033	94.60901916	92.90996784
221018A00046	10/18/2022	4.9	4/30/2024	10/18/2022	105.83239	104.3218802	102.8408204	101.3884264	99.96393823	98.56662202	97.19576931	95.85069575	94.53074011
180620A00044	6/20/2018	2.89	6/20/2023	6/20/2018	101.32145	100.681616	100.0498654	99.42604223	98.80999788	98.20158731	97.60066912	97.00710534	96.42076143
180926A00031	9/26/2018	3.24	9/26/2023	9/26/2018	101.99476	101.0893706	100.200046	99.3263651	98.4679176	97.62430746	96.79515225	95.9800826	95.17874162
190102A00058	1/2/2019	2.91	1/2/2024	1/2/2019	102.1852	101.0173846	99.87622861	98.76082772	97.67031713	96.60387038	95.56069724	94.54004172	93.5411803
190523A00015	5/23/2019	2.51	4/1/2024	5/23/2019	102.1059	100.7024285	99.3249892	97.97291918	96.64557924	95.3423512	94.06263704	92.80585806	91.57145408
200710A00006	7/10/2020	0.4	7/10/2023	7/10/2020	99.670002	98.98255244	98.30453975	97.63577065	96.97605708	96.32521609	95.68306959	95.04944428	94.4241714
210722A00001	7/22/2021	1.1	7/22/2026	7/22/2021	101.35904	97.76176324	94.31015008	90.99748778	87.8174127	84.76389205	81.83120444	79.01392167	76.30689177
080909A00042	9/9/2008	4.74	9/11/2023	9/9/2008	103.30818	102.4355511	101.5777184	100.7343072	99.90495528	99.08931257	98.28704049	97.49781157	96.72130896
160422A00026	4/22/2016	2.62	4/22/2026	4/22/2016	106.40457	102.9535165	99.6337136	96.43947564	93.36539052	90.40630902	87.55733048	84.8137894	82.17124287
161222A00030	12/22/2016	3.09	12/22/2026	12/22/2016	110.51081	106.3190051	102.3115146	98.47921372	94.81348461	91.30618253	87.94960707	84.73647523	81.65989636
180109A00028	1/9/2018	2.6	1/9/2025	1/9/2018	103.98183	101.8047559	99.68395874	97.61758025	95.60383968	93.64102942	91.72751135	89.86171338	88.04212614
180727A00028	7/27/2018	3.25	7/27/2026	7/27/2018	109.88691	106.1048399	102.4749424	98.9902074	95.64399254	92.43000129	89.34226273	86.37511237	83.52317445
190530A00004	5/30/2019	2.24	5/30/2023	5/30/2019	100.85089	100.2695483	99.69489227	99.12680623	98.56517806	98.00989817	97.46085943	96.91795712	96.38108884
191120A00006	11/20/2019	2.67	11/20/2035	11/20/2019	116.90624	104.5186753	93.61597142	84.01022666	75.53827888	68.05833721	61.44708431	55.59718422	50.4151372
200305A00020	3/5/2020	0.95	3/5/2025	3/5/2020	100.42249	98.13593137	95.91226636	93.74942968	91.64543649	89.59837797	87.60641796	85.66778977	83.78079314
110805A00014	8/5/2011	4.06	8/17/2026	8/5/2011	112.62377	108.7476351	105.0286611	101.459606	98.03360674	94.74415337	91.58506863	88.55048906	85.63484721
160307A00026	3/7/2016	2.2	3/7/2023	3/7/2016	100.56679	100.2155983	99.86686129	99.52055379	99.17665044	98.8351262	98.4959564	98.1591167	97.82458308
170228A00014	2/28/2017	2.89	3/1/2027	2/28/2017	110.22674	105.8504202	101.6744294	97.68857982	93.883248	90.2493456	86.77828673	83.46195779	80.29268907
170322A00024	3/22/2017	3.72	9/22/2036	3/22/2017	131.07953	117.1120658	104.8782761	94.14928785	84.72772785	76.44323954	69.14865413	62.71672154	57.03731666
170808A00037	8/8/2017	2.19	12/15/2022	8/8/2017	100.25685	100.1320611	100.0075968	99.88345677	99.75963965	99.63614418	99.51296908	99.39011307	99.26757488
171127A00016	11/27/2017	2.28	11/27/2023	11/27/2017	101.42443	100.3551873	99.30841864	98.28342077	97.27951994	96.29606998	95.33245084	94.38806734	93.46234788

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180110A00029	1/10/2018	3.13	1/10/2028	1/10/2018	112.83261	107.578419	102.6043619	97.89396692	93.43181955	89.20349053	85.19546733	81.39509077	77.79049637
190606A00027	6/6/2019	2.51	6/5/2026	6/6/2019	106.29709	102.7323204	99.30683845	96.01443594	92.84921672	89.80558014	86.87820442	84.06203103	81.3522501
191105A00008	11/5/2019	1.83	11/5/2024	11/5/2019	102.05455	100.0708952	98.13574743	96.24761555	94.40506469	92.60671394	90.85123383	89.13734408	87.46381138
200303A00001	3/3/2020	1.15	3/3/2025	3/3/2020	100.89054	98.60351466	96.37923035	94.21563207	92.11074407	90.06266611	88.06957015	86.12969711	84.24135394
180831A00016	8/31/2018	2.99	8/31/2023	8/31/2018	101.64477	100.8106783	99.99025424	99.18316496	98.38908737	97.60770876	96.83872634	96.08184689	95.33678637
200130A00016	1/30/2020	1.58	1/30/2025	1/30/2020	101.78928	99.58238278	97.43383278	95.34165907	93.30397301	91.31896579	89.38490421	87.50012688	85.66304045
200226A00016	2/26/2020	1.57	2/26/2025	2/26/2020	101.56198	99.28653641	97.07302314	94.91941348	92.82376297	90.7842016	88.79893052	86.86621895	84.98440109
200227A00013	2/27/2020	1.43	2/27/2024	2/27/2020	100.53468	99.23090397	97.95060313	96.69318203	95.458069	94.24471117	93.05257374	91.88113916	90.72990655
211222A00005	12/22/2021	1.2	7/15/2024	12/22/2021	100.34657	98.67919414	97.04714581	95.44936273	93.88482919	92.35256986	90.85164774	89.38116226	87.94024746
221006A00033	10/6/2022	4.56	10/7/2024	10/6/2022	107.01177	105.0590211	103.1520701	101.2895615	99.47019216	97.69270587	95.95589132	94.25858015	92.59964516
160616A00034	6/16/2016	1.97	6/17/2024	6/16/2016	101.56428	99.96029365	98.38917714	96.84998534	95.34180873	93.86377224	92.41503358	90.99478169	89.60223532
190114A00042	1/14/2019	2.92	1/13/2023	1/14/2019	100.53296	100.3276631	100.1232172	99.91961659	99.71685612	99.51493048	99.31383448	99.11356296	98.91411079
190917A00029	9/17/2019	2.02	12/6/2022	9/17/2019	100.19753	100.097705	99.99808363	99.89866932	99.79946137	99.7004591	99.60166187	99.50306902	99.40467989
200115A00024	1/15/2020	1.88	1/17/2023	1/15/2020	100.33095	100.1149273	99.89984571	99.6857001	99.47248433	99.26019229	99.04881795	98.8383553	98.62879841
221014A00050	10/14/2022	4.49	10/14/2027	10/14/2022	119.71678	114.5045971	109.5576285	104.8609199	100.4004422	96.16302559	92.13630229	88.30865355	84.66916055
130405A00007	4/5/2013	2.91	4/17/2028	4/5/2013	113.02556	107.4776513	102.24024	97.29430423	92.62208493	88.20699424	84.03353257	80.08721176	76.35448407
170224A00044	5/24/2017	3.29	5/24/2029	5/24/2017	116.50467	109.8210277	103.5741657	97.73312635	92.26930414	87.15625528	82.36952367	77.88648157	73.68618391
180103A00011	1/3/2018	2.35	1/3/2023	1/3/2018	100.3928	100.215112	100.0380553	99.86162738	99.68582498	99.51064474	99.33608333	99.16213749	98.98880394
191104A00009	11/4/2019	1.91	11/6/2023	11/4/2019	100.85498	99.84642844	98.85797349	97.88901583	96.93898302	96.00732481	95.09351213	94.19703603	93.31740676
200221A00014	2/21/2020	1.49	2/21/2023	2/21/2020	100.33103	100.0183897	99.70769938	99.3989426	99.09210134	98.78715778	98.48409432	98.18289356	97.88353833
180402A00005	4/2/2018	2.94	4/3/2023	4/2/2018	100.95468	100.5286918	100.1062928	99.68743907	99.27208606	98.86019004	98.45170799	98.04659759	97.64481722
190507A00006	5/7/2019	2.57	5/8/2023	5/7/2019	100.91781	100.3965544	99.88068545	99.37011568	98.86476362	98.36454949	97.86939511	97.37922392	96.89396087
190530A00034	5/30/2019	2.44	5/30/2024	5/30/2019	102.24385	100.6828459	99.15319153	97.65401116	96.18445974	94.74372315	93.33101679	91.94558422	90.58669591
190809A00008	8/9/2019	1.87	8/3/2023	8/9/2019	100.66781	99.91291636	99.16930262	98.43672048	97.71492592	97.00368207	96.30275893	95.61193318	94.93098786
190819A00030	8/19/2019	2.01	8/20/2029	8/19/2019	109.28648	102.5736714	96.31942938	90.49006619	85.05453007	79.98418994	75.25263493	70.83549153	66.71025676
190826A00060	8/26/2019	2.02	8/26/2027	8/26/2019	106.62228	101.8800745	97.37667323	93.0988399	89.03414236	85.1708955	81.49811261	78.00546013	74.68321553
220112A00005	1/12/2022	1.55	1/12/2026	1/12/2022	102.75173	99.6184146	96.59639687	93.68106914	90.86804365	88.15314215	85.5323843	83.00197689	80.55830369
140827A00038	8/27/2014	3.07	8/30/2024	8/27/2014	103.85789	102.0383308	100.2594811	98.52019473	96.81936312	95.15591589	93.52881915	91.93707404	90.3797153
151229A00079	12/29/2015	3	12/30/2025	12/29/2015	106.88394	103.7283782	100.6830738	97.74352213	94.90543474	92.16472474	89.51749607	86.9600332	84.48879152
190522A00003	5/22/2019	2.55	5/22/2024	5/22/2019	102.39587	100.8543676	99.34359195	97.86269731	96.41086438	94.98730347	93.59125316	92.22197897	90.87877222
191218A00013	12/18/2019	1.94	12/19/2022	12/18/2019	100.24298	100.1071342	99.97166816	99.83658247	99.70187548	99.56754558	99.43359117	99.30001064	99.16680241
191223A00056	12/23/2019	2.46	12/14/2029	12/23/2019	111.62459	104.579472	98.03252621	91.94585016	86.28461555	81.01680356	76.11296433	71.54599827	67.29095697
200225A00015	2/25/2020	1.54	2/26/2024	2/25/2020	100.67844	99.3762654	98.0978175	96.84248925	95.6096907	94.39885183	93.2094217	92.04086765	90.89267458

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170602A00023	6/2/2017	2.09	6/2/2023	6/2/2017	100.76957	100.1803803	99.59806066	99.02249356	98.45356212	97.89115211	97.33515193	96.78545247	96.24194713
170622A00038	6/22/2017	3.32	6/22/2034	6/22/2017	123.24733	111.6591877	101.3173473	92.0793886	83.81991506	76.42843825	69.80753453	63.87123793	58.54363803
171206A00038	12/6/2017	2.69	12/6/2027	12/6/2017	111.12645	105.9830025	101.1108741	96.49430051	92.11851948	87.96969915	84.03487463	80.30188902	76.75933868
180530A00072	5/30/2018	3.06	5/30/2024	5/30/2018	103.22922	101.6601101	100.1224907	98.61548457	97.13824285	95.6899478	94.26981133	92.87707363	91.5110019
210216A00006	2/16/2021	1.44	2/15/2030	2/16/2021	105.4367	98.40740387	91.89199419	85.850331	80.24560199	75.04403151	70.21461554	65.72888116	61.56066794
220920A00050	9/20/2022	4.37	9/20/2024	9/20/2022	106.46875	104.56717	102.7092294	100.8936689	99.11927265	97.38486783	95.68932235	94.03154339	92.41047576
130212A00017	2/12/2013	2.29	2/15/2023	2/12/2013	100.53031	100.2340901	99.93962641	99.64689914	99.35589293	99.0665926	98.77898311	98.49304964	98.20877749
161020A00002	10/20/2016	1.96	8/15/2023	10/20/2016	100.758	99.97061264	99.19549676	98.43237164	97.68096053	96.94099511	96.21221524	95.4943686	94.78721041
180104A00017	1/4/2018	2.77	1/3/2025	1/4/2018	104.03713	101.8807704	99.7797232	97.73217886	95.73640088	93.7907234	91.89354772	90.04333892	88.23862279
180530A00024	5/30/2018	3.44	5/30/2029	5/30/2018	117.51051	110.7790535	104.4878138	98.6055511	93.10340207	87.95468797	83.13473839	78.62073011	74.39153954
190403A00006	4/3/2019	2.48	4/3/2024	4/3/2019	102.24174	100.8291113	99.44282265	98.08219899	96.74659035	95.43536832	94.14792508	92.88367257	91.6420417
190701A00023	7/1/2019	1.95	7/1/2024	7/1/2019	101.79891	100.1514474	98.53833159	96.95854885	95.41112939	93.89514109	92.40968767	90.95390696	89.5269692
190816A00015	8/16/2019	2.2	8/16/2029	8/16/2019	109.59072	102.9165652	96.69615996	90.89628252	85.4863069	80.43798877	75.72526845	71.32409128	67.21224368
200221A00016	2/21/2020	1.69	2/21/2025	2/21/2020	101.82409	99.55986065	97.35688829	95.2131616	93.12674707	91.0957867	89.11849449	87.19315322	85.31811125
160921A00020	9/21/2016	1.97	9/21/2023	9/21/2016	100.8262	99.93988408	99.06910106	98.2134463	97.37252811	96.54596823	95.73340124	94.93447403	94.14884531
170622A00040	6/22/2017	3.41	6/23/2036	6/22/2017	126.75734	113.273753	101.4470994	91.06126503	81.92951273	73.89035047	66.80399685	60.54935716	55.02143427
180719A00064	7/19/2018	3.3	7/21/2025	7/19/2018	106.62051	103.8981412	101.2595666	98.70165983	96.22143703	93.81604711	91.48276462	89.21898316	87.02220927
181218A00072	12/18/2018	3.04	12/19/2022	12/18/2018	100.39269	100.2566658	100.1210261	99.98576718	99.85088735	99.71638502	99.58225859	99.44850644	99.31512701
190326A00003	3/26/2019	2.57	3/27/2023	3/26/2019	100.77131	100.364915	99.96179217	99.56190461	99.16521346	98.77168051	98.38126815	97.99393937	97.60965775
190730A00007	7/30/2019	2.19	7/30/2024	7/30/2019	102.10702	100.3849594	98.69998692	97.05096505	95.43680746	93.85647206	92.30895865	90.79330676	89.3085937
200309A00019	3/9/2020	0.89	3/11/2024	3/9/2020	99.80786	98.47564633	97.16729038	95.88220762	94.61983186	93.37961478	92.16102527	90.96354877	89.78668659
201116A00011	11/16/2020	0.71	11/15/2024	11/16/2020	99.532738	97.55350629	95.62312682	93.7400814	91.90291011	90.1102086	88.36062552	86.65286013	84.98566
160615A00031	6/15/2016	2.51	6/17/2030	6/15/2016	113.45763	105.8306321	98.77746962	92.25184867	86.21143838	80.61751589	75.43464109	70.63036236	66.17495014
170531A00080	5/31/2017	2.3	5/31/2024	5/31/2017	102.23031	100.663317	99.12788024	97.62311366	96.1481644	94.70221089	93.28446146	91.89415296	90.53054948
200226A00008	2/26/2020	1.38	2/26/2025	2/26/2020	101.41865	99.13876663	96.92105608	94.76348348	92.66409333	90.62100516	88.63241023	86.69656832	84.8118047
200304A00021	3/4/2020	0.94	3/4/2024	3/4/2020	100.03971	98.72137245	97.4263905	96.15419763	94.90424516	93.67600156	92.46895181	91.28259677	90.11645257
200325A00029	3/25/2020	1.15	3/24/2023	3/25/2020	100.22846	99.83117238	99.43703369	99.04600673	98.65805469	98.27314135	97.89123106	97.51228871	97.13627976
180914A00013	9/14/2018	3.48	9/14/2028	9/14/2018	116.27997	110.271461	104.6186279	99.29851101	94.28974587	89.57244526	85.12809011	80.93942878	76.99038431
190328A00079	3/28/2019	2.37	3/28/2024	3/28/2019	102.06046	100.6651048	99.29549231	97.95097199	96.63091496	95.33471291	94.06177726	92.81153833	91.58344466
190524A00040	5/24/2019	2.47	5/24/2024	5/24/2019	102.2641	100.7186699	99.20410875	97.71955621	96.26418724	94.83720664	93.4378478	92.06537132	90.71906383
190820A00038	8/20/2019	1.76	8/20/2024	8/20/2019	101.41629	99.64580322	97.91451347	96.22128641	94.56502932	92.94468934	91.35925169	89.80773796	88.2892045
160714A00023	8/10/2016	2.49	8/10/2028	8/10/2016	110.39057	104.6419904	99.23134989	94.13698838	89.33874383	84.81784414	80.55680384	76.53932923	72.75023091
190111A00026	1/11/2019	3.48	1/11/2034	1/11/2019	126.04565	114.602536	104.3488149	95.1529263	86.89855683	79.48280052	72.81454865	66.81308042	61.40682839

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190913A00014	9/13/2019	2.08	9/13/2024	9/13/2019	102.09391	100.2536255	98.45535172	96.69789038	94.98008056	93.30080175	91.6589721	90.05354689	88.48351696
191125A00036	11/25/2019	2.29	11/23/2029	11/25/2019	110.39031	103.4405833	96.9797684	90.97088094	85.37991707	80.17559908	75.32914358	70.81405056	66.60591129
200221A00003	2/25/2020	1.69	2/25/2025	2/25/2020	101.83813	99.56228671	97.34828918	95.19411774	93.09782853	91.05755245	89.07149179	87.13791705	85.25516393
200309A00033	3/9/2020	1.06	3/9/2026	3/9/2020	100.90241	97.65929573	94.53644473	91.52879649	88.63152977	85.84004986	83.14997675	80.55713391	78.05753783
200327A00074	3/31/2020	1.76	3/29/2024	3/31/2020	101.02936	99.64175256	98.27976171	96.94273649	95.63005132	94.34110101	93.07530002	91.83208156	90.61089694
081219A00069	12/19/2008	4.26	12/22/2023	12/19/2008	103.67996	102.5322765	101.4100894	100.3125544	99.23886418	98.18824663	97.15996254	96.15330404	95.16759292
170120A00010	1/20/2017	3.71	1/22/2036	1/20/2017	130.03043	116.6941493	104.9461276	94.58510582	85.43645315	77.34851456	70.18947526	63.84466741	58.21425482
180727A00037	7/27/2018	3.13	7/27/2023	7/27/2018	101.59624	100.8562704	100.1270771	99.40842116	98.70007532	98.00181878	97.31343705	96.63472165	95.96546993
190625A00012	6/25/2019	2.12	6/25/2024	6/25/2019	101.85996	100.2315501	98.63680572	97.07474438	95.54442428	94.04493983	92.57541985	91.13502589	89.72295074
190819A00005	8/19/2019	1.62	8/21/2023	8/19/2019	100.56396	99.76042875	98.96969252	98.19145024	97.42540751	96.67127912	95.92878871	95.19766839	94.47765846
200430A00007	4/30/2020	0.72	4/28/2023	4/30/2020	99.965551	99.47423299	98.98772319	98.50595144	98.02884886	97.55634792	97.08838237	96.62488724	96.16579876
210304A00004	3/4/2021	0.58	3/4/2024	3/4/2021	99.394287	98.08304005	96.79499079	95.52957716	94.28625513	93.06449766	91.86379396	90.68364899	89.52358278
150817A00077	8/17/2015	2.49	8/17/2023	8/17/2015	101.25823	100.4623348	99.6789357	98.90773996	98.14846385	97.4008324	96.66457901	95.93944521	95.22518029
170818A00003	8/18/2017	2.23	8/20/2024	8/18/2017	102.50211	100.7172987	98.97203404	97.26517022	95.59560333	93.96226981	92.36414465	90.80023964	89.26960176
210114A00009	1/19/2021	2.66	1/17/2030	1/19/2021	113.11823	105.9364	99.26701435	93.07070217	87.31131737	81.95566029	76.97322254	72.33595526	68.0180585
210623A00011	6/23/2021	0.56	6/23/2023	6/23/2021	99.759207	99.11770762	98.48441943	97.85918603	97.24185458	96.63227603	96.03030511	95.43580013	94.84862291
130821A00019	8/21/2013	3.81	8/29/2025	8/21/2013	108.71862	105.8552845	103.0829514	100.3982419	97.79792209	95.27889527	92.83819549	90.47298113	88.18052905
150512A00029	5/12/2015	3.03	5/12/2025	5/12/2015	105.43279	102.9127185	100.4662108	98.0906856	95.78366976	93.54279234	91.3657795	89.25044985	87.19471009
180116A00031	1/16/2018	2.58	1/17/2023	1/16/2018	100.48256	100.2663048	100.05099	99.83661195	99.62316453	99.41064165	99.19903724	98.98834532	98.77855993
180118A00037	1/18/2018	2.88	1/21/2025	1/18/2018	104.38166	102.1743473	100.0246289	97.93057815	95.89035292	93.90218799	91.96439093	90.07533841	88.2334728
180813A00026	8/13/2018	2.87	8/11/2023	8/13/2018	101.53618	100.7551966	99.98622154	99.22897937	98.48320284	97.74863272	97.02501758	96.31211345	95.60968357
190222A00021	2/22/2019	2.95	8/21/2024	2/22/2019	103.58024	101.786956	100.0333475	98.31827328	96.64063007	94.99935477	93.39342249	91.8218449	90.28366857
191202A00005	12/2/2019	2.03	12/2/2024	12/2/2019	102.30646	100.2525767	98.24997968	96.29704294	94.39220771	92.53397599	90.72090762	88.95161762	87.22477358
210210A00005	2/10/2021	0.52	2/13/2024	2/10/2021	99.315557	98.05647849	96.82414024	95.61769273	94.43632262	93.27925079	92.1457305	91.03504573	89.94650958
150610A00017	6/10/2015	2.9	6/15/2023	6/10/2015	101.25019	100.6248513	100.0072381	99.39720622	98.79461644	98.19933303	97.61122352	97.03015864	96.4560122
180730A00041	7/30/2018	3.14	7/31/2023	7/30/2018	101.62317	100.8723282	100.132568	99.40364425	98.68532026	97.97736609	97.27955843	96.59168034	95.91352102
180910A00007	9/10/2018	2.96	9/8/2023	9/10/2018	101.7416	100.8844583	100.0417454	99.21310331	98.39818158	97.59664126	96.80815452	96.03240416	95.26908319
180914A00008	9/14/2018	3.15	9/14/2023	9/14/2018	101.85111	100.9785318	100.1209082	99.27785279	98.44899639	97.63398215	96.8324651	96.04411168	95.26859923
190802A00032	8/2/2019	2.01	8/2/2024	8/2/2019	101.80214	100.0750113	98.38523039	96.73165742	95.11320283	93.52882099	91.97750794	90.45829928	88.97026821
191007A00029	10/7/2019	1.88	10/9/2029	10/7/2019	108.47259	101.660671	95.32326503	89.42489502	83.93290311	78.81721708	74.0501335	69.60612	65.46163509
200429A00044	5/1/2020	1.86	4/30/2025	5/1/2020	102.43	99.9795307	97.60023996	95.28964922	93.0453857	90.86517332	88.7468281	86.68825385	84.68743806
161212A00040	12/12/2016	2.45	12/12/2023	12/12/2016	101.67548	100.5647973	99.47832559	98.41527873	97.37490508	96.35648482	95.35932832	94.3827746	93.4261898
180719A00004	7/19/2018	3.07	7/19/2023	7/19/2018	101.51411	100.7960205	100.0880915	99.39010694	98.70185811	98.02314212	97.35376168	96.69352495	96.04224529

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190909A00025	9/9/2019	1.88	9/9/2024	9/9/2019	101.70373	99.87787784	98.09350839	96.34943721	94.64452402	92.97766796	91.34780594	89.75391113	88.19499147
200302A00054	3/2/2020	1.31	3/3/2025	3/2/2020	100.96515	98.68342598	96.46417347	94.30535289	92.20500019	90.16122621	88.17221341	86.23621272	84.35154057
201022A00012	10/26/2020	2.25	10/24/2030	10/26/2020	110.50677	102.721385	95.54664886	88.93139954	82.82901294	77.19697541	71.99650223	67.19219319	62.75172163
150601A00696	6/1/2015	2.83	3/13/2025	6/1/2015	104.48393	102.1343778	99.84955773	97.62733466	95.46565592	93.36254803	91.31611314	89.32452566	87.38602908
160628A00040	6/28/2016	1.56	6/28/2023	6/28/2016	100.47119	99.81288192	99.16317293	98.52189133	97.88887406	97.26396223	96.64700101	96.03783948	95.43633052
170313A00034	3/13/2017	3.31	3/15/2027	3/13/2017	111.52279	107.1001536	102.8807427	98.85416417	95.01061045	91.34082219	87.8360548	84.48804728	81.28899306
181120A00024	11/20/2018	3.25	11/20/2023	11/20/2018	102.31463	101.2606499	100.2283922	99.21718644	98.22639286	97.25539749	96.30361073	95.37046621	94.45541967
190620A00055	6/25/2019	2.08	4/17/2023	6/25/2019	100.61715	100.1538778	99.69486907	99.24006815	98.78941725	98.34285965	97.90033967	97.46180264	97.02719485
191104A00023	11/4/2019	2.24	8/4/2028	11/4/2019	108.94078	103.2485677	97.8908165	92.84609055	88.09444492	83.61731069	79.39739253	75.41857447	71.66583318
220902A00042	9/2/2022	3.89	9/5/2023	9/2/2022	102.43765	101.5864708	100.7494502	99.9262405	99.11650158	98.31990444	97.53613075	96.76487234	96.00583088
151223A00070	12/23/2015	2.57	12/26/2023	12/23/2015	101.87824	100.7290329	99.6056925	98.50735475	97.43319182	96.38241202	95.35425791	94.34800446	93.36295733
160804A00014	8/4/2016	1.99	8/5/2024	8/4/2016	101.77793	100.0431944	98.34611477	96.68555636	95.06042914	93.46968631	91.91232217	90.38737005	88.89390041
180222A00026	2/22/2018	2.98	2/21/2025	2/22/2018	105.11623	102.8070971	100.5603216	98.37385262	96.24572128	94.17403577	92.15697775	90.19279895	88.27981801
180713A00013	7/13/2018	2.88	7/13/2023	7/13/2018	101.41478	100.7124453	100.0198337	99.3367477	98.66299161	97.99837495	97.34271246	96.69582383	96.0575336
190513A00013	5/13/2019	2.52	5/13/2024	5/13/2019	102.29094	100.7741931	99.28743565	97.82984522	96.40063279	94.9990374	93.62432485	92.27578658	90.95273846
191003A00022	10/3/2019	1.72	2/3/2023	10/3/2019	100.33644	100.0735934	99.8121234	99.55201769	99.29326565	99.03585675	98.77978057	98.5250268	98.27158523
200224A00025	2/24/2020	1.59	1/23/2025	2/24/2020	101.50611	99.32630939	97.20367021	95.1362769	93.12229484	91.15996613	89.24760565	87.38359734	85.56639072
190208A00008	2/8/2019	2.86	2/8/2024	2/8/2019	102.3164	101.0499953	99.81190454	98.60117324	97.41689336	96.25819706	95.12425445	94.01427145	92.92748794
190328A00065	3/28/2019	2.56	3/28/2024	3/28/2019	102.16151	100.7681274	99.40040597	98.05770234	96.73939031	95.44486409	94.17353752	92.92484323	91.69823191
200224A00002	2/24/2020	1.56	2/24/2023	2/24/2020	100.32918	100.0086232	99.6901087	99.37362053	99.05913943	98.74664637	98.43612256	98.12754944	97.82090869
200309A00020	3/9/2020	0.96	3/10/2025	3/9/2020	100.14778	97.85799116	95.63141405	93.46596581	91.35964469	89.31052586	87.31675802	85.37656017	83.4882185
121116A00006	11/16/2012	2.64	11/13/2025	11/16/2012	105.46085	102.4518869	99.54501241	96.73618828	94.02156476	91.3974661	88.86038166	86.4069574	84.03398794
131217A00023	12/17/2013	3.74	1/2/2024	12/17/2013	103.16604	101.9920936	100.8449064	99.72356925	98.62721488	97.55501441	96.50617529	95.47993931	94.4755808
150727A00013	7/27/2015	3.04	7/28/2025	7/27/2015	105.95672	103.2251971	100.5782859	98.01281542	95.525754	93.1142057	90.77540317	88.50670083	86.30556852
181108A00025	11/8/2018	3.44	7/31/2023	11/8/2018	101.84993	101.0981475	100.3574535	99.62760554	98.90836689	98.19950741	97.50080363	96.81203848	96.13300099
190115A00034	1/15/2019	2.91	1/17/2023	1/15/2019	100.55404	100.3376686	100.1222437	99.90775611	99.69419949	99.48156777	99.26985491	99.0590549	98.84916179
200325A00030	3/25/2020	1.5	3/25/2025	3/25/2020	101.76188	99.40788439	97.11987319	94.89563278	92.73304073	90.63005769	88.58472365	86.59515431	84.65953773
170111A00014	1/11/2017	3.47	1/12/2032	1/11/2017	121.64646	112.2998414	103.7716762	95.98529848	88.87162415	82.36836118	76.41930843	70.97373043	65.98579927
181010A00021	10/10/2018	3.29	3/15/2023	10/10/2018	100.99657	100.6224904	100.2511912	99.88264139	99.51681029	99.15366784	98.79318435	98.43533058	98.08007773
190807A00020	8/7/2019	1.57	2/7/2024	8/7/2019	100.80883	99.55285486	98.32535669	97.12536558	95.95195731	94.80424896	93.68139659	92.58259312	91.50706634
200130A00005	1/30/2020	1.73	1/30/2024	1/30/2020	100.84797	99.61476522	98.4115579	97.23726195	96.09084566	94.97132584	93.87776505	92.80926894	91.76498381
120113A00012	1/13/2012	3.62	1/15/2027	1/13/2012	112.36052	108.0826011	103.9943729	100.0863492	96.34957541	92.77559499	89.35641817	86.08449347	82.9526809
171122A00009	11/22/2017	2.2	11/22/2022	11/22/2017	100.14461	100.0835035	100.0224827	99.96154882	99.90070171	99.83994117	99.77926701	99.71867905	99.65817711

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200310A00073	3/12/2020	2.12	3/11/2027	3/12/2020	106.32655	102.0266371	97.92526028	94.01225981	90.27804244	86.713551	83.31023172	80.06000374	76.95523068
200511A00022	5/11/2020	1.6	2/1/2030	5/11/2020	105.56852	98.61510226	92.16575337	86.18134165	80.6259663	75.46667729	70.67321795	66.21779139	62.07484826
160830A00034	8/30/2016	1.9	8/30/2023	8/30/2016	100.72626	99.89904657	99.08536528	98.28488884	97.49729797	96.72228363	95.9595466	95.20879704	94.46975421
190429A00003	4/29/2019	2.62	10/13/2023	4/29/2019	101.48566	100.5375623	99.60715154	98.69393856	97.79744949	96.91722775	96.0528333	95.20384182	94.36984407
190724A00025	7/24/2019	1.96	7/24/2023	7/24/2019	100.78523	100.0557939	99.33689117	98.62829414	97.92978237	97.24114162	96.56216371	95.89264628	95.23239257
190917A00035	9/19/2019	2.02	10/16/2023	9/19/2019	100.92641	99.9730928	99.03773186	98.11982217	97.21887864	96.33443406	95.46603821	94.61325714	93.77567243
200818A00005	8/18/2020	1.05	8/18/2027	8/18/2020	101.9631	97.35180975	92.97333456	88.81475718	84.86393933	81.1094749	77.54064189	74.14735778	70.92013801
190807A00012	8/7/2019	1.76	2/7/2023	8/7/2019	100.35464	100.0807678	99.8083949	99.53750744	99.26809328	99.00014041	98.73363693	98.46857107	98.20493122
190923A00017	9/23/2019	1.74	9/23/2024	9/23/2019	101.73228	99.86428264	98.03958419	96.2569303	94.51510746	92.81294504	91.14931345	89.52312248	87.9333196
200224A00046	2/24/2020	1.59	2/24/2025	2/24/2020	101.60211	99.33191369	97.12335966	94.97443013	92.88318548	90.84776101	88.86636348	86.93726796	85.05881476
081211A00029	12/11/2008	4.57	12/15/2023	12/11/2008	103.96672	102.8360987	101.7301741	100.648145	99.58924146	98.5527264	97.53789372	96.54406681	95.57059698
100930A00008	9/30/2010	3.82	9/30/2025	9/30/2010	108.65307	105.7123553	102.8675696	100.1150633	97.45134942	94.87309247	92.37710056	89.96031863	87.61982169
111006A00023	10/6/2011	3.81	10/15/2026	10/6/2011	112.25542	108.2270781	104.3685006	100.6716237	97.12881256	93.73283342	90.4768301	87.35430237	84.35908558
121116A00022	11/16/2012	2.78	11/16/2029	11/16/2012	114.80961	107.6848486	101.0585438	94.8931099	89.15398054	83.80935466	78.82996167	74.18884782	69.86118163
130904A00039	9/4/2013	4.19	9/15/2028	9/4/2013	121.31335	115.1261147	109.3038834	103.823116	98.66190484	93.79985786	89.21798629	84.89860128	80.8252186
180323A00013	3/23/2018	3.18	3/23/2028	3/23/2018	114.33846	108.8222576	103.6106019	98.68507672	94.02846875	89.62468574	85.458678	81.51636576	77.78457193
220927A00024	9/27/2022	4.7	9/27/2024	9/27/2022	107.17414	105.2465292	103.3635318	101.5238445	99.72621423	97.96943217	96.25233223	94.57378907	92.93271644
190802A00003	8/2/2019	2.01	8/2/2024	8/2/2019	101.80214	100.0750113	98.38523039	96.73165742	95.11320283	93.52882099	91.97750794	90.45829928	88.97026821
191104A00018	11/5/2019	1.96	11/5/2024	11/5/2019	102.05739	100.0786455	98.14819906	96.26457078	94.42633411	92.63211603	90.88059461	89.17049671	87.50059583
191104A00025	11/4/2019	2.33	8/2/2030	11/4/2019	111.05929	103.45551	96.43220673	89.94191752	83.94130276	78.39076466	73.25410556	68.49821911	64.0928111
200305A00040	3/10/2020	0.99	3/10/2023	3/10/2020	100.13829	99.77984271	99.42396207	99.07062277	98.7197976	98.37145971	98.02558264	97.68214031	97.34110699
200310A00025	3/10/2020	0.87	3/11/2024	3/10/2020	99.94144	98.60569575	97.29390941	96.00549237	94.73987529	93.49650687	92.27485316	91.07439686	89.89463669
200403A00016	4/3/2020	0.63	4/17/2023	4/3/2020	99.982925	99.52090832	99.06315707	98.60961249	98.16021669	97.71491282	97.2736451	96.83635874	96.40299993
150601A00530	6/1/2015	3.08	7/24/2024	6/1/2015	103.77779	102.0524459	100.364012	98.71136811	97.09344048	95.50919854	93.95765285	92.43785302	90.94888569
160212A00044	2/12/2016	1.93	2/13/2023	2/12/2016	100.41855	100.1280435	99.83922486	99.55207863	99.26659021	98.98274523	98.70052948	98.41992889	98.14092959
181010A00023	10/10/2018	3.41	4/1/2024	10/10/2018	103.39124	101.9781953	100.5913501	99.23003392	97.89360336	96.58143603	95.2929299	94.02750239	92.7845896
190122A00046	1/22/2019	3.29	1/22/2029	1/22/2019	116.79469	110.3937498	104.3925755	98.76396802	93.48272377	88.52547843	83.87056272	79.49787036	75.38873706
190729A00007	7/29/2019	2.17	7/28/2023	7/29/2019	100.88338	100.143661	99.41476326	98.6964473	97.98848399	97.29065079	96.60273148	95.92451599	95.25580009
190814A00008	8/14/2019	1.84	8/14/2024	8/14/2019	101.54164	99.78561045	98.06815247	96.38813462	94.74446558	93.13609529	91.56201294	90.02124516	88.51285431
190820A00008	8/20/2019	1.76	8/20/2024	8/20/2019	101.41629	99.64580322	97.91451347	96.22128641	94.56502932	92.94468934	91.35925169	89.80773796	88.2892045
200302A00011	3/2/2020	1.31	2/27/2025	3/2/2020	100.95851	98.68735974	96.47813381	94.32880928	92.23744337	90.20216744	88.22118368	86.29276207	84.41523734
200312A00016	3/16/2020	1.09	2/15/2023	3/16/2020	100.17388	99.87835091	99.58457317	99.29252881	99.00220245	98.71357893	98.42664324	98.14138057	97.85777627
200429A00053	5/1/2020	2.18	4/30/2025	5/1/2020	103.23055	100.7699422	98.38073669	96.060449	93.80669971	91.6172064	89.48977903	87.42231554	85.4127978

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210312A00005	3/12/2021	0.53	3/12/2024	3/12/2021	99.473562	98.13859986	96.82762569	95.54005005	94.27530208	93.03282906	91.81209567	90.6125833	89.43378944
220518A00008	5/18/2022	3.01	5/20/2024	5/18/2022	103.10481	101.5628165	100.0514943	98.56999658	97.11750813	95.69324296	94.29644312	92.92637742	91.58234025
170111A00009	1/11/2017	3.16	1/11/2028	1/11/2017	112.99353	107.7326049	102.752244	98.03593899	93.56824721	89.33471337	85.32180097	81.51682871	77.9079117
171206A00041	12/6/2017	2.44	12/6/2024	12/6/2017	103.45805	101.3760827	99.34632083	97.36710018	95.43682553	93.55396426	91.71704343	89.92464688	88.1754126
180530A00014	5/30/2018	2.93	5/30/2023	5/30/2018	101.20242	100.6205525	100.0453654	99.47674223	98.91457121	98.35874302	97.80915081	97.26569014	96.72825887
200110A00022	1/13/2020	2	1/6/2025	1/13/2020	102.3659	100.2203424	98.13008082	96.09329742	94.10824936	92.17326502	90.28674047	88.44713608	86.65297335
210212A00016	2/17/2021	1.32	2/18/2025	2/17/2021	100.9593	98.71380672	96.52891629	94.40263317	92.33303744	90.31828506	88.35660425	86.44629216	84.58571166
210903A00002	9/8/2021	1.22	9/8/2023	9/8/2021	100.15436	99.30582959	98.47161076	97.65134073	96.84467198	96.05126848	95.27080519	94.50296758	93.74745129
080910A00065	9/10/2008	5.03	9/15/2023	9/10/2008	103.51527	102.6320385	101.763947	100.9106065	100.0716425	99.24669313	98.43540859	97.63745063	96.85249209
170119A00006	1/19/2017	2.85	1/21/2025	1/19/2017	104.31468	102.1081286	99.95915532	97.8658344	95.82632426	93.83886005	91.90174976	90.01337046	88.17216488
180703A00015	7/3/2018	3.06	7/3/2023	7/3/2018	101.43248	100.7578561	100.0921976	99.43532579	98.78706742	98.14725389	97.51572093	96.89230851	96.27686071
200228A00015	3/3/2020	1.34	10/16/2023	3/3/2020	100.26838	99.31848938	98.38651156	97.47194077	96.57429292	95.69310172	94.82791785	93.97830825	93.14385535
200601A00009	6/1/2020	0.84	6/2/2025	6/1/2020	99.89111	97.38834022	94.96025598	92.60418325	90.31756143	88.09793809	85.94296356	83.8503859	81.81804616
200911A00006	9/11/2020	0.37	9/11/2023	9/11/2020	99.498083	98.64353176	97.80355993	96.97779755	96.16588667	95.36748127	94.58224675	93.80985952	93.05000649
170316A00018	3/16/2017	2.8	3/18/2024	3/16/2017	102.45707	101.0875745	99.74288645	98.4223856	97.12547591	95.85158041	94.60014052	93.37061529	92.16248073
180214A00004	2/14/2018	2.71	2/14/2023	2/14/2018	100.67966	100.3855833	100.0932359	99.80260014	99.51366098	99.2264035	98.94081297	98.65687482	98.37457467
180328A00010	3/28/2018	3.1	3/28/2025	3/28/2018	105.31759	102.9188803	100.5872	98.3203069	96.11604512	93.97234344	91.88721121	89.85873478	87.88507402
190923A00012	9/23/2019	2.43	9/25/2034	9/23/2019	115.08446	103.6331996	93.45690079	84.40582979	76.34857135	69.16970748	62.76779807	57.05362513	51.94866511
191206A00009	12/6/2019	2.87	12/4/2037	12/6/2019	120.49961	106.2858598	93.99267355	83.34598629	74.11233217	66.09263918	59.11700028	53.04026229	47.73830111
191219A00036	12/20/2019	2.1	12/20/2024	12/20/2019	102.52139	100.4182955	98.36855259	96.37043978	94.42230484	92.5225615	90.66968629	88.86221548	87.09874226
200305A00012	3/5/2020	1.14	3/5/2025	3/5/2020	100.56851	98.28640362	96.06694528	93.9080778	91.80782758	89.76429645	87.77565834	85.84015613	83.95609867
180705A00003	7/5/2018	3.04	7/5/2023	7/5/2018	101.42809	100.7480891	100.0771962	99.41523243	98.76202018	98.11738667	97.48116363	96.85318716	96.23329758
200110A00013	1/10/2020	1.76	1/10/2024	1/10/2020	100.97321	99.78988032	98.63415228	97.5050677	96.40171364	95.32321845	94.26874946	93.23751083	92.22874151
200214A00005	2/14/2020	1.59	2/14/2025	2/14/2020	101.8653	99.61463014	97.42448379	95.29284857	93.21779634	91.19747643	89.23011192	87.31399606	85.44748899
220401A00009	4/1/2022	2.98	4/1/2027	4/1/2022	110.25293	105.8120958	101.5776763	97.53900122	93.68601087	90.00921351	86.49965054	83.14886378	79.948865
150610A00008	6/10/2015	3.58	6/10/2030	6/10/2015	121.50276	113.5963975	106.2771628	99.49805178	93.21606835	87.39186004	81.98939123	76.97564718	72.32036598
161003A00004	10/3/2016	1.91	10/3/2023	10/3/2016	100.79375	99.87567643	98.97426038	98.08905504	97.21962626	96.36555525	95.52643796	94.70188438	93.89151796
190620A00026	6/20/2019	2.09	6/20/2023	6/20/2019	100.74987	100.1128281	99.48383097	98.86272461	98.24936113	97.64359632	97.04528953	96.45430356	95.87050458
200513A00002	5/13/2020	0.56	5/13/2024	5/13/2020	99.462677	97.96529423	96.49761662	95.05883186	93.64815723	92.2648379	90.90814562	89.57737758	88.27185529
221011A00037	10/11/2022	4.68	10/7/2024	10/11/2022	107.24505	105.2899815	103.3807525	101.516009	99.694444682	97.91480855	96.17588175	94.47649701	92.81552608
130211A00017	2/11/2013	3.27	2/15/2028	2/11/2013	113.79232	108.4163594	103.3315188	98.52046872	93.96699826	89.65594085	85.57310154	81.70518967	78.0397565
160628A00031	6/28/2016	1.77	6/28/2023	6/28/2016	100.55179	99.89393961	99.24466399	98.60379902	97.97118217	97.34665508	96.73006343	96.12125679	95.52008851
160801A00001	8/1/2016	1.97	8/1/2024	8/1/2016	101.72794	100.0040966	98.31748191	96.66695772	95.05143495	93.46986866	91.92125581	90.40463307	88.91907483

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180521A00025	5/21/2018	3.24	5/21/2025	5/21/2018	106.36407	103.8010906	101.3134741	98.89854921	96.5537614	94.27666259	92.0649061	89.91624168	87.82851089
200131A00016	1/31/2020	1.73	1/31/2025	1/31/2020	101.84077	99.63652374	97.49049903	95.40073172	93.36533818	91.38251438	89.45053168	87.56773298	85.73252907
200228A00019	2/28/2020	1.21	2/20/2025	2/28/2020	101.0063	98.74848534	96.5518615	94.41440692	92.33418453	90.30933334	88.33806491	86.41866001	84.54946545
200429A00052	5/1/2020	1.43	4/30/2024	5/1/2020	100.60152	99.13196731	97.69115321	96.27831115	94.89269978	93.53360345	92.20033105	90.89221499	89.60861021
211222A00027	12/22/2021	1.26	10/15/2024	12/22/2021	100.60822	98.69874926	96.83481192	95.01504772	93.2381456	91.50284222	89.80791986	88.15220447	86.53456377
180627A00026	6/27/2018	2.87	6/27/2023	6/27/2018	101.33825	100.6794172	100.0291449	99.38726295	98.75360969	98.12802761	97.5103632	96.90046681	96.29819254
190315A00014	3/15/2019	2.74	3/15/2024	3/15/2019	102.3608	100.9998318	99.66339137	98.35086896	97.06167796	95.7952505	94.55103669	93.32850396	92.12713629
190816A00036	8/16/2019	1.77	8/16/2024	8/16/2019	101.42205	99.66192015	97.94055575	96.25682564	94.60963842	92.99794347	91.42072903	89.87702044	88.36587837
191108A00013	11/8/2019	2.25	11/8/2029	11/8/2019	111.08498	104.1089951	97.62229773	91.58798859	85.97212961	80.74349523	75.87334264	71.33520239	67.10468781
191210A00011	12/10/2019	1.92	12/12/2022	12/10/2019	100.21125	100.0948049	99.97864713	99.86277312	99.74718178	99.63187206	99.5168429	99.40209323	99.28762202
221007A00003	10/7/2022	4.67	10/7/2025	10/7/2022	111.20883	108.211939	105.3130965	102.5085561	99.79473721	97.16821539	94.62571469	92.16410037	89.78037198
151223A00072	12/23/2015	2.81	12/23/2025	12/23/2015	106.65268	103.5091593	100.4752119	97.54637725	94.7184056	91.98724612	89.3490364	86.80009234	84.33689868
170417A00057	4/17/2017	2.32	4/17/2023	4/17/2017	100.72899	100.265403	99.80608848	99.3509838	98.90003116	98.45317382	98.01035606	97.57152319	97.13662151
180913A00030	9/13/2018	3.33	9/12/2025	9/13/2018	107.08818	104.2189301	101.4420011	98.7539346	96.15142152	93.63129404	91.19051874	88.82619017	86.53552473
181219A00006	12/19/2018	3.06	12/19/2023	12/19/2018	102.28041	101.1492687	100.0431348	98.96118939	97.90264491	96.86674762	95.85277587	94.86003841	93.88787278
190625A00024	6/25/2019	2.26	6/25/2025	6/25/2019	103.67548	101.0613505	98.52629138	96.0674181	93.68197172	91.36731273	89.1209149	86.94035958	84.82333026
190813A00016	8/13/2019	1.88	8/13/2024	8/13/2019	101.61012	99.85606206	98.14048152	96.46224559	94.82026294	93.21348372	91.64089755	90.10153168	88.59444923
160613A00047	6/15/2016	2.18	6/16/2025	6/15/2016	103.42415	100.8375179	98.32859216	95.89456307	93.53273922	91.24054452	89.01551243	86.85528042	84.75758488
200429A00009	4/29/2020	0.78	4/29/2025	4/29/2020	100.0468	97.62232673	95.26853595	92.98296858	90.763264	88.60715795	86.51247789	84.47713873	82.49913867
220125A00010	1/25/2022	1.89	1/25/2027	1/25/2022	105.15182	100.9988617	97.03287777	93.24441897	89.62457078	86.1649188	82.85751754	79.69486134	76.66985722
170815A00006	8/15/2017	2.5	8/15/2024	8/15/2017	102.7326	100.9629386	99.23216374	97.53913381	95.88275173	94.26196164	92.67574695	91.12312851	89.6031629
180426A00011	4/26/2018	2.94	4/26/2023	4/26/2018	101.10247	100.6127899	100.1278542	99.64759071	99.1719322	98.70081261	98.23416716	97.77193229	97.31404565
190807A00005	8/7/2019	1.77	8/7/2024	8/7/2019	101.39423	99.65777943	97.95913776	96.29716669	94.67077744	93.07892399	91.52060096	89.99484161	88.50071595
200709A00005	7/10/2020	2.23	7/10/2030	7/10/2020	110.2792	102.7602609	95.81190739	89.38777561	83.44550517	77.9463697	72.85494722	68.13882196	63.76831458
220406A00006	4/6/2022	2.65	10/6/2023	4/6/2022	101.49556	100.5659451	99.65333268	98.75725812	97.87727473	97.01295184	96.16387401	95.32964037	94.50986405
180111A00016	1/11/2018	2.57	1/11/2023	1/11/2018	100.45136	100.2517041	100.0528533	99.85480252	99.65754688	99.46108157	99.26540178	99.07050277	98.87637982
191025A00009	10/25/2019	2.26	5/25/2029	10/25/2019	109.81877	103.3465898	97.30145322	91.65293627	86.37293584	81.43547965	76.81655423	72.49394756	68.44710515
191122A00021	11/26/2019	3.4	11/22/2038	11/26/2019	128.32925	112.8153521	99.48822545	88.02094281	78.13736043	69.60398308	62.22316795	55.82744162	50.27474321
191226A00020	12/26/2019	2.44	12/21/2029	12/26/2019	111.49884	104.4406189	97.88272555	91.78700313	86.11839949	80.84469649	75.93626685	71.36585302	67.10836598
081217A00076	12/17/2008	3.86	12/22/2023	12/17/2008	103.34539	102.197865	101.0758784	99.97858243	98.90516751	97.85485926	96.82691646	95.82062932	94.8353178
180727A00038	7/27/2018	3.36	7/25/2025	7/27/2018	106.81286	104.0773552	101.4262934	98.85652042	96.3650195	93.94890852	91.6054329	89.33195888	87.12596723
190606A00028	6/6/2019	2.74	6/6/2029	6/6/2019	112.97933	106.3749137	100.20617	94.44200647	89.05370717	84.01473927	79.30057639	74.8885368	70.75763556
190816A00007	8/16/2019	1.77	8/16/2023	8/16/2019	100.59994	99.81067733	99.0337585	98.26890027	97.51582335	96.774257	96.04393873	95.324614	94.61603587

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200204A00016	2/4/2020	1.72	2/6/2023	2/4/2020	100.34452	100.0733841	99.80371765	99.53550664	99.26873925	99.00340384	98.73948888	98.47698297	98.21587483
200227A00004	2/27/2020	1.65	2/27/2030	2/27/2020	106.96775	99.8515044	93.25664627	87.14236577	81.47123849	76.20892921	71.32392276	66.78727962	62.57241374
200306A00014	3/6/2020	1.38	3/6/2030	3/6/2020	103.98496	97.00172448	90.53208322	84.53574767	78.97577554	73.81827837	69.03215523	64.58885091	60.4621361
200529A00004	5/29/2020	0.56	5/29/2024	5/29/2020	99.457798	97.91888439	96.41095777	94.93315101	93.48462863	92.06458576	90.67224669	89.30686357	87.96771514
180910A00033	9/10/2018	3.43	9/8/2028	9/10/2018	115.95244	109.9694602	104.3398762	99.04093162	94.05144464	89.3516945	84.92331389	80.74918957	76.81337074
190805A00008	8/5/2019	1.88	8/4/2023	8/5/2019	100.67702	99.919406	99.17315871	98.43802233	97.71375014	97.00010269	96.29684755	95.60375898	94.92061776
150817A00099	8/17/2015	3.19	8/17/2027	8/17/2015	112.16619	107.3159038	102.7068967	98.32587869	94.16035856	90.19859539	86.42954959	82.8428372	79.42868741
180223A00026	2/23/2018	2.92	12/15/2022	2/23/2018	100.34809	100.2232002	100.0986343	99.97439288	99.85047461	99.72687821	99.60360241	99.48064592	99.35800749
190808A00050	8/8/2019	1.7	8/8/2024	8/8/2019	101.50097	99.7568617	98.05083841	96.38175857	94.74852671	93.15009021	91.58543721	90.05359459	88.55362611
200720A00037	7/22/2020	2.1	7/21/2025	7/22/2020	103.35146	100.6740539	98.07938497	95.56436404	93.12603939	90.76159069	88.46832204	86.24365548	84.08512484
221012A00051	10/12/2022	4.7	10/11/2024	10/12/2022	107.3273	105.3608061	103.4406592	101.5654809	99.73394564	97.94477596	96.1967403	94.48865098	92.81936243
170629A00073	6/29/2017	2.2	6/29/2023	6/29/2017	100.89924	100.2366492	99.58273194	98.93732324	98.30025793	97.67137508	97.05051788	96.43753349	95.83227295
190809A00021	8/9/2019	2.12	8/9/2029	8/9/2019	110.00845	103.2995138	97.04658854	91.21628072	85.77780823	80.70278581	75.96502631	71.54035939	67.40646623
191108A00011	11/8/2019	2.08	10/18/2024	11/8/2019	102.23131	100.2977594	98.41042634	96.56791968	94.76890424	93.01209364	91.29624815	89.62017269	87.98271491
191230A00012	12/30/2019	1.77	12/1/2023	12/30/2019	100.88149	99.80476822	98.75091639	97.7192138	96.70896825	95.7195161	94.75022084	93.80047167	92.86968226
200227A00006	2/27/2020	1.47	2/27/2025	2/27/2020	101.33183	99.05626122	96.8427059	94.68914282	92.59362655	90.55428587	88.56932051	86.63699805	84.75565093
200814A00009	8/18/2020	1.36	8/16/2028	8/18/2020	103.91725	98.33706201	93.08882489	88.15112485	83.50403995	79.12902527	75.00881077	71.12730722	67.46951954
131106A00003	11/6/2013	3.57	11/15/2023	11/6/2013	102.62002	101.5776889	100.5565526	99.55597306	98.57533343	97.61404131	96.67152756	95.74724519	94.84066831
151229A00081	12/29/2015	3.76	12/31/2035	12/29/2015	130.57141	117.2518455	105.5113866	95.15076916	85.99699051	77.89971753	70.72820548	64.3686494	58.72190579
180530A00027	5/30/2018	3.61	6/1/2032	5/30/2018	123.43035	113.6513267	104.7585181	96.66607887	89.29692023	82.58177754	76.45837852	70.87070397	65.7683299
181218A00077	12/18/2018	3.09	12/18/2023	12/18/2018	102.30874	101.1800904	100.0763355	98.99666054	97.9402832	96.90645479	95.89445838	94.9036072	93.933243
190107A00023	1/7/2019	2.87	1/6/2023	1/7/2019	100.48298	100.2970885	100.1118879	99.92737753	99.74355369	99.56041248	99.37795007	99.19616268	99.01504653
210804A00008	8/6/2021	2.28	8/4/2028	8/6/2021	109.16938	103.4707187	98.10678291	93.05612991	88.29880169	83.81621705	79.59106906	75.60723084	71.84966875
160714A00020	9/6/2016	2.28	9/4/2026	9/6/2016	105.9888	102.1911542	98.55063769	95.05995674	91.71219456	88.50078835	85.41950946	82.46244466	79.62397856
181026A00002	10/26/2018	3.28	10/26/2023	10/26/2018	102.19368	101.20718	100.2397243	99.29076605	98.35977825	97.44625364	96.54970392	95.66965886	94.80566546
190726A00017	7/26/2019	2.44	7/24/2026	7/26/2019	106.34824	102.6531569	99.10685571	95.70249517	92.43358881	89.29398718	86.27785799	83.37966767	80.59416396
191004A00005	10/4/2019	1.54	10/4/2024	10/4/2019	101.38229	99.48868641	97.63963608	95.83382177	94.06997738	92.34688226	90.66335921	89.01827269	87.410527
191008A00033	10/8/2019	1.71	10/8/2024	10/8/2019	101.47399	99.57380387	97.71847888	95.90668472	94.13714177	92.40861652	90.71991955	89.06990368	87.45746215
120517A00007	5/17/2012	2.42	5/31/2023	5/17/2012	100.95938	100.3749666	99.79730046	99.22626611	98.66174991	98.10364081	97.55183028	97.00621221	96.46668288
160701A00019	7/1/2016	1.73	7/3/2023	7/1/2016	100.52983	99.85862521	99.19635199	98.54283361	97.8978974	97.26137522	96.63310327	96.01292201	95.40067595
180403A00006	4/3/2018	3.07	4/3/2028	4/3/2018	113.81228	108.2809884	103.0568659	98.12122912	93.45662885	89.04675859	84.87637384	80.93121776	77.19795233
180529A00056	5/29/2018	3	5/26/2023	5/29/2018	101.22513	100.6540427	100.0893915	99.53107126	98.97897587	98.43300163	97.8930471	97.35901308	96.83080254
181005A00012	10/5/2018	3.33	10/4/2024	10/5/2018	104.85195	102.9238864	101.0410362	99.20206317	97.40568331	95.65065876	93.93579574	92.25994273	90.62198865

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190619A00009	6/19/2019	2.26	6/19/2024	6/19/2019	102.04857	100.4350695	98.85469185	97.30648552	95.78953148	94.30294556	92.84587686	91.41750612	90.01704427
191002A00017	10/2/2019	1.84	10/2/2024	10/2/2019	101.70878	99.82171277	97.97883124	96.1788378	94.4204821	92.70255844	91.02390386	89.38339631	87.77995294
200716A00015	7/20/2020	1.54	7/19/2024	7/20/2020	100.95623	99.2727932	97.62517626	96.01230224	94.43313581	92.88668305	91.37198936	89.88813748	88.43424562
210216A00009	2/16/2021	0.92	2/16/2027	2/16/2021	101.66559	97.50973877	93.54487032	89.76123244	86.14962672	82.70137037	79.40826435	76.2625638	73.25695038
090429A00044	4/29/2009	4.1	4/29/2024	4/29/2014	100.3455	100.262154	100.1446252	99.86337312	99.30414187	98.61503367	97.89224501	97.16997866	96.45826017
130416A00025	4/16/2013	2.27	4/18/2028	4/16/2018	99.917155	99.25531449	97.93202137	96.07403082	93.89226826	91.5899165	89.29885522	87.07753822	84.93950925
140508A00011	5/8/2014	2.32	5/8/2024	5/8/2019	100.17004	99.96675839	99.4529075	98.74239451	97.97496803	97.20323175	96.4419602	95.69332604	94.95715659
140723A00038	7/23/2014	2.3	7/23/2024	7/23/2019	100.15873	99.92880549	99.36556262	98.59317901	97.75305791	96.90547358	96.06897977	95.24678051	94.43878352
141119A00005	11/19/2014	2.53	11/19/2024	11/19/2019	100.15984	99.919857	99.31318282	98.44804797	97.48046186	96.49126783	95.51193963	94.55016222	93.60648789
150202A00006	2/2/2015	1.92	2/3/2025	2/3/2020	100.03442	99.59263217	98.77479617	97.74800497	96.65266368	95.55385472	94.47288361	93.41344669	92.37531048
151223A00007	12/23/2015	3.76	12/23/2030	12/23/2022	100.37518	99.760398	98.33083874	95.78317069	92.17023816	87.81575554	83.1635151	78.57465211	74.24964487
161012A00020	10/11/2016	2.96	10/14/2031	10/11/2023	100.7774	98.96693337	96.24740014	92.4655607	87.79585255	82.73802209	77.73968235	73.03705484	68.68667765
170515A00052	5/15/2017	3.78	5/15/2042	5/15/2024	103.11441	100.9269397	97.96178615	93.81648965	88.44100792	82.40252467	76.51190229	71.15956273	66.36820334
170519A00006	5/19/2017	3	5/19/2032	5/19/2022	100.07987	99.42578836	97.94755467	95.52702602	92.36911075	88.82936934	85.23718318	81.7867742	78.53611869
170705A00037	7/5/2017	2.85	7/6/2032	7/6/2027	107.46184	103.5537815	99.66560427	95.7805386	91.92251298	88.13620759	84.49020458	81.03505429	77.78395095
170802A00074	8/2/2017	2.92	8/2/2027	8/2/2022	99.849579	99.45370394	98.23382064	96.24914277	93.71436796	90.87574919	87.94846005	85.07089865	82.30493133
170809A00042	8/9/2017	2.35	8/9/2027	8/9/2022	99.99123	99.4337304	98.2815161	96.63123167	94.68493315	92.62618549	90.57029196	88.56862085	86.63414886
171004A00022	10/4/2017	2.74	10/4/2027	10/4/2022	100.00925	99.44554751	98.15598655	96.130666	93.55509191	90.6791543	87.72100687	84.81965556	82.03552208
171005A00047	10/5/2017	3.29	10/5/2032	10/5/2022	100.02207	99.30670531	97.51489576	94.4642939	90.4217623	85.85074401	81.23352576	76.85013963	72.78279108
180105A00005	1/5/2018	3.07	1/5/2028	1/5/2023	100.5753	100.0441339	99.13340801	97.72776376	95.88914315	93.79519217	91.60842132	89.43682556	87.33236444
180105A00006	1/5/2018	3.07	1/5/2028	1/5/2023	100.5753	100.044134	99.13340803	97.7277638	95.88914322	93.79519227	91.60842145	89.43682572	87.33236463
180130A00087	1/30/2018	2.92	1/31/2028	1/30/2023	100.49312	99.92745015	98.94953114	97.46731806	95.57115881	93.44535901	91.24951133	89.0817367	86.98459988
180302A00003	3/2/2018	3.89	3/2/2033	3/2/2023	100.83701	100.035738	98.45551373	95.72277084	91.73590644	86.90567776	81.77396332	76.78627629	72.14923177
180315A00030	3/15/2018	3.76	3/15/2033	3/17/2025	105.74603	102.7438686	99.31559821	95.29705051	90.61404166	85.44778471	80.16705897	75.1120247	70.4357294
180504A00024	5/4/2018	3.62	5/4/2028	5/4/2023	101.33177	100.423164	99.10736138	97.17687201	94.52019064	91.26592153	87.67297865	83.99266628	80.42053745
180627A00005	6/27/2018	3.63	6/30/2033	6/30/2023	101.31204	100.3740376	98.95726815	96.798269	93.80571405	90.18647868	86.32418766	82.53126421	78.9542798
180703A00033	7/3/2018	3.4	7/3/2028	7/3/2023	101.50363	100.5825871	99.41939519	97.90741814	96.00231503	93.8017744	91.4654679	89.12529246	86.8560574
190111A00040	1/11/2019	3.74	1/11/2034	1/11/2024	102.66733	100.8673483	98.47877127	95.22651408	91.02406075	86.15594157	81.13984117	76.35364667	71.93152827
190116A00015	1/16/2019	3.61	1/17/2034	1/16/2024	102.53564	100.9270323	98.8807678	96.22259254	92.85310162	88.97880987	84.94818063	81.05078869	77.39873745
190204A00054	2/4/2019	3.98	2/6/2034	2/2/2024	102.79014	101.013356	98.60020136	95.25512712	90.85237585	85.68817777	80.31480166	75.16629158	70.41826828
190222A00023	2/22/2019	3.66	2/22/2034	2/22/2026	107.65345	103.567597	99.07019404	94.04696831	88.49728342	82.64680457	76.85168841	71.40877664	66.43143715
190301A00015	3/1/2019	3.86	3/1/2034	3/2/2026	107.94619	104.0231057	99.71392425	94.88186029	89.53688091	83.84706746	78.16136687	72.78803713	67.86218344
190409A00016	4/9/2019	2.91	4/9/2029	4/9/2024	102.26893	100.4586602	98.29413381	95.66240411	92.54369329	89.09956237	85.56653523	82.12775749	78.86210953

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190409A00017	4/9/2019	3.01	4/9/2029	4/9/2024	102.34696	100.509296	98.24709588	95.45326979	92.09496918	88.34619405	84.46963833	80.68453915	77.09511243
190430A00020	4/30/2019	3.41	4/28/2034	4/28/2026	106.82865	102.56306	97.84897105	92.59513574	86.84769767	80.88538201	75.08895066	69.7043928	64.79941622
190520A00018	5/20/2019	3.7	5/20/2044	5/20/2024	102.79185	100.1853487	96.5726992	91.55903208	85.33460904	78.78483792	72.7018794	67.28942213	62.49485387
190530A00044	5/30/2019	2.85	5/30/2034	5/30/2024	102.02942	99.89732651	97.21184824	93.86011971	89.91206412	85.71047414	81.59338907	77.72395143	74.12417758
190807A00041	8/7/2019	2.27	8/7/2034	7/7/2024	100.96406	98.39294295	95.16386478	91.26517407	86.96302023	82.65405059	78.57302133	74.77778625	71.25556243
190807A00044	8/7/2019	2.27	8/7/2034	8/7/2024	101.0786	98.44755215	95.18181921	91.26828711	86.96321288	82.6540527	78.57302146	74.7777864	71.2555626
190827A00044	8/27/2019	1.9	8/27/2029	8/27/2024	101.08822	99.0929402	96.82004533	94.25938834	91.50459951	88.71089064	85.99181351	83.38926562	80.90543965
190930A00079	9/30/2019	2.04	10/1/2029	9/30/2024	101.35069	99.37258549	97.12348934	94.58397749	91.82892229	89.01151382	86.25743546	83.61886724	81.10158758
190930A00083	9/30/2019	2.04	10/1/2029	9/30/2024	101.35069	99.37258509	97.12348859	94.58397626	91.8289205	89.01151146	86.25743256	83.61886385	81.10158373
191007A00012	10/7/2019	2	10/5/2029	10/7/2024	101.18309	99.06546429	96.69047093	94.04766854	91.22944095	88.38533725	85.62401983	82.98447572	80.46757365
191007A00013	10/7/2019	2	10/5/2029	10/7/2024	101.18309	99.06546408	96.69047035	94.04766753	91.22943946	88.38533527	85.62401739	82.98447284	80.46757036
191028A00015	10/28/2019	2.49	10/27/2034	10/28/2024	101.85538	99.18118815	95.95868157	92.10635738	87.82456267	83.46701325	79.30763504	75.4346124	71.84264605
191031A00036	10/31/2019	2.9	10/31/2039	10/31/2024	101.77542	98.72164746	94.76073379	89.82414357	84.27812398	78.74122596	73.60723895	68.95380198	64.74480041
191031A00037	10/31/2019	2.59	10/30/2034	10/31/2024	101.63905	99.01873697	95.82673289	91.98453682	87.70888414	83.36607738	79.22712244	75.37389818	71.79966831
191220A00029	12/20/2019	2.57	12/19/2031	12/20/2024	102.38109	99.97275029	97.24694682	94.14314684	90.73264361	87.21205168	83.77321418	80.51085633	77.43676371
200108A00009	1/8/2020	2.4	1/8/2035	1/8/2025	101.78643	98.80325573	95.24838196	91.10278951	86.5929677	82.09249574	77.84281329	73.90725373	70.27118098
200108A00040	1/8/2020	2.52	1/8/2030	1/8/2025	102.20239	99.4556919	96.26456742	92.5767085	88.4914727	84.2561991	80.1154737	76.19611112	72.52102573
200110A00012	1/10/2020	2.57	1/10/2035	1/10/2025	102.04652	99.14119912	95.7198321	91.72017284	87.34212573	82.93134846	78.74235666	74.84937068	71.24312789
200115A00023	1/15/2020	2.16	1/15/2030	1/15/2025	101.78917	99.52192559	97.04288391	94.32607109	91.4378928	88.51168069	85.66210846	82.93841624	80.34472993
200115A00025	1/15/2020	2.1	1/15/2025	1/15/2023	100.03229	99.29772581	98.13881397	96.65476637	95.01932688	93.3587259	91.72497052	90.12993429	88.57379565
200306A00021	3/6/2020	1.16	3/6/2030	3/6/2025	99.540333	96.94644901	94.08877069	91.05501093	88.00547691	85.05859345	82.25107357	79.58193789	77.04336808
200309A00013	3/9/2020	1.1	3/8/2030	3/9/2025	99.38963	96.77980038	93.90400465	90.85916254	87.80913288	84.86741916	82.06603976	79.40285463	76.86994977
200316A00030	3/16/2020	1.35	3/15/2030	3/16/2025	100.34649	97.82647656	95.06057293	92.08580295	89.03978417	86.0612575	83.21332838	80.50487476	77.92917965
200316A00032	3/16/2020	1.35	3/15/2030	3/16/2025	100.34649	97.82647635	95.06057252	92.0858023	89.03978328	86.06125636	83.21332702	80.50487319	77.92917788
200318A00015	3/18/2020	1.69	3/18/2030	3/18/2023	99.343562	97.87706644	95.62783405	92.78356823	89.67304599	86.55876829	83.56273307	80.71354121	78.0069922
200326A00035	3/26/2020	1.68	3/26/2030	3/26/2025	100.81739	98.34858797	95.64335787	92.72206518	89.70090837	86.72057429	83.86095628	81.13962774	78.55134942
200423A00008	4/23/2020	1.59	4/23/2030	4/23/2025	99.916266	96.4154444	92.33306886	87.76911518	83.0187027	78.38690179	74.0222786	69.94954921	66.15279272
200423A00009	4/23/2020	1.59	4/23/2030	4/23/2025	99.916267	96.4154446	92.33306923	87.76911574	83.01870346	78.38690274	74.02227974	69.94955051	66.15279418
200423A00010	4/23/2020	1.59	4/23/2030	4/23/2025	99.916267	96.41544477	92.3330695	87.76911614	83.01870399	78.3869034	74.02228052	69.9495514	66.15279516
200430A00021	4/30/2020	1.2	4/30/2030	4/30/2025	99.616556	97.01376229	94.14199857	91.08619462	88.00840021	85.03197146	82.19697732	79.50300614	76.94207984
200505A00010	5/5/2020	0.89	5/6/2030	5/5/2025	99.249742	96.50949241	93.52077006	90.38749084	87.27258426	84.27864126	81.4322775	78.72938661	76.16148567
200512A00023	5/12/2020	1.78	5/11/2035	5/12/2025	99.301768	95.07353474	90.0464433	84.49202152	78.92115333	73.69790562	68.92798909	64.5950625	60.65692412
200609A00003	6/9/2020	1.66	6/8/2035	6/9/2025	98.237737	93.43741711	87.74219958	81.55104866	75.45759283	69.81440194	64.70466568	60.09864627	55.94409437

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200612A00001	6/12/2020	0.75	6/12/2030	6/12/2025	98.893839	96.06120263	92.9928196	89.80876456	86.66913043	83.66400372	80.81042956	78.10216163	75.53039823
201022A00008	10/22/2020	1.02	10/22/2035	10/22/2025	97.775522	93.49025703	88.73031709	83.83758464	79.14744355	74.79940302	70.79650268	67.11013655	63.71079247
201029A00008	10/29/2020	0.92	10/29/2030	10/29/2025	99.05726	96.03690289	92.82173153	89.51812548	86.27362475	83.17481316	80.2377388	77.45534748	74.81794343
201030A00025	10/30/2020	2.02	10/28/2050	10/30/2025	97.995053	91.49718168	83.65036906	75.45022381	67.94430384	61.43096853	55.83662467	51.02609374	46.87172338
201116A00019	11/16/2020	1.32	11/15/2030	11/16/2025	98.947623	94.92921617	90.46455791	85.7295755	81.02142048	76.55163162	72.3817034	68.50361472	64.89575721
201118A00015	11/18/2020	1.66	11/18/2036	11/18/2027	99.084617	92.51654646	85.54711749	78.50455779	71.80591878	65.71259232	60.2727092	55.43389098	51.12532969
201118A00017	11/18/2020	1.66	11/18/2036	11/18/2027	99.084619	92.51654906	85.54712117	78.50456259	71.80592461	65.71259903	60.27271662	55.43389896	51.1253381
201118A00018	11/18/2020	1.85	11/18/2036	11/18/2027	99.467705	92.96703942	86.05877539	79.05800503	72.37635248	66.2843112	60.83945272	55.99318829	51.67570473
201202A00016	12/2/2020	1.32	12/3/2035	12/2/2025	98.486456	94.20878945	89.47689057	84.5663177	79.82441391	75.41541221	71.35653969	67.62084433	64.17810642
201202A00017	12/2/2020	1.32	12/3/2035	12/2/2025	98.486456	94.20879043	89.47689216	84.56631998	79.82441688	75.41541583	71.35654388	67.62084904	64.1781116
201229A00003	12/29/2020	1.28	12/30/2030	12/30/2025	98.778834	94.66552138	90.10995751	85.30718758	80.55779704	76.06206093	71.87385325	67.9824104	64.36524973
201230A00018	12/30/2020	1.52	12/28/2035	12/28/2027	98.626351	92.1121742	85.26528297	78.39424103	71.87298321	65.92798897	60.59730884	55.83238008	51.5692763
210108A00007	1/8/2021	1.65	1/8/2036	1/8/2026	98.421555	93.17482769	87.15015236	80.74978164	74.5186369	68.78195832	63.60996557	58.96553463	54.79134415
210225A00010	2/25/2021	2.02	2/25/2041	2/25/2026	99.998928	95.00412598	89.27164524	83.1187161	77.11625183	71.61705788	66.67915398	62.25039222	58.26931729
210405A00013	4/5/2021	1.82	4/7/2036	4/5/2026	100.67903	96.44542456	91.79187699	86.87170455	81.98965752	77.38695065	73.14048153	69.23725515	65.64622167
210622A00004	6/22/2021	2.42	6/20/2036	6/22/2026	101.90158	96.84767174	91.11458498	84.86237474	78.51213004	72.49972518	67.02755484	62.11050641	57.69819753
210910A00009	9/10/2021	1.77	9/10/2036	9/10/2026	101.31007	96.8001595	91.93304255	86.8508173	81.83003811	77.10285684	72.74927304	68.75699535	65.09285021
210924A00016	9/24/2021	1.91	9/24/2036	9/24/2026	101.93508	97.4758778	92.66572305	87.62262191	82.59738339	77.83688173	73.44344014	69.41325552	65.71424733
211019A00005	10/19/2021	2.49	10/20/2036	10/19/2026	103.27145	98.05493158	92.22086433	85.90119323	79.44592093	73.28483419	67.66147685	62.61283778	58.09167381
211110A00017	11/10/2021	2.01	11/10/2036	11/10/2026	102.51661	97.96978944	93.10372575	88.01755079	82.94392621	78.12497907	73.67504019	69.59544556	65.85419089
211116A00012	11/16/2021	2.22	12/18/2034	11/16/2026	103.33123	99.18077577	94.81854954	90.28758697	85.74084744	81.36128836	77.26198337	73.46159874	69.94045553
211124A00008	11/24/2021	2.62	11/22/2041	11/24/2026	104.30607	99.17175889	93.46676474	87.28304948	80.97937182	75.02143179	69.63638782	64.82125869	60.5109346
211215A00020	12/15/2021	1.85	12/15/2031	12/15/2026	102.67766	99.05557406	95.3756131	91.66059322	87.98629734	84.44523097	81.09025604	77.93010829	74.95416237
211227A00012	12/27/2021	2.39	12/29/2036	12/27/2028	104.96779	98.09159407	91.02616334	83.89223648	76.95118049	70.47972048	64.63196382	59.41704179	54.77544017
220217A00024	2/17/2022	2.43	2/17/2027	2/17/2025	102.74999	100.4710573	98.07099515	95.52451136	92.84299747	90.09807015	87.37628059	84.73800954	82.20323946
220617A00069	6/17/2022	4.06	6/17/2027	6/17/2025	107.45961	104.9687082	102.4712149	99.94372159	97.35355273	94.68278733	91.93647125	89.14572257	86.39288945
220831A00108	8/31/2022	4.07	8/31/2027	9/2/2025	108.39748	105.5444509	102.7018802	99.84365341	96.93568616	93.96043801	90.92440419	87.86175886	84.85683975
210611A00010	6/11/2021	1.02	6/11/2026	6/11/2021	100.86764	97.61362817	94.4855073	91.47767893	88.58482914	85.8019105	83.124127	80.54691992	78.06595467
160608A00029	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.0044419	98.84203192	95.79978226	92.87242138	90.05494077	87.34258014	84.73081351	82.21533628
210915A00018	9/15/2021	0.74	9/16/2024	9/15/2021	99.590272	97.82856361	96.10704487	94.42456094	92.77999787	91.1722807	89.60037175	88.06326915	86.56000532
160212A00047	2/12/2016	1.94	2/12/2026	2/12/2016	101.78187	100.0854081	98.43482466	96.82850512	95.26490441	93.74254338	92.26000543	90.81593335	89.40902642
170711A00010	7/11/2017	2.38	7/12/2027	7/11/2017	104.21864	101.7707147	99.41048942	97.1340761	94.93778504	92.8181163	90.77174854	88.79552871	86.88646231
200514A00008	5/14/2020	1.23	5/14/2030	5/14/2020	102.39478	96.65341554	91.31129415	86.3377116	81.70450679	77.38583614	73.35797059	69.59911129	66.08922238

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170504A00049	5/4/2017	2.63	5/6/2024	5/4/2017	102.3909	100.9224758	99.48281651	98.07114708	96.68671828	95.32880718	93.99671603	92.6897711	91.40732169
171207A00025	12/7/2017	2.91	12/7/2027	12/7/2017	110.33144	105.6970257	101.2986391	97.12282345	93.15696512	89.38923604	85.80854043	82.40446542	79.16723525
200421A00026	4/21/2020	1.34	4/19/2030	4/21/2020	103.07281	97.34197365	92.00648132	87.03616859	82.40334529	78.08258243	74.05051571	70.285667	66.76828216
120807A00026	8/7/2012	2.42	8/9/2027	8/7/2012	104.05388	101.5747386	99.18550876	96.88215908	94.66086859	92.51801459	90.45016097	88.45404731	86.52657869
190205A00020	2/5/2019	3.32	2/5/2029	2/5/2019	114.40358	108.7078207	103.3560257	98.32518211	93.59395011	89.14253067	84.95254571	81.00692822	77.28982164
190305A00017	3/5/2019	3.12	3/5/2026	3/5/2019	107.12979	104.0466104	101.0736722	98.2064193	95.44050907	92.77180093	90.19634569	87.71037572	85.31029561
151120A00019	11/20/2015	2.72	11/20/2030	11/20/2015	108.75875	104.5015779	100.4843069	96.69090611	93.10654255	89.71748688	86.51102363	83.47536926	80.59959726
180402A00013	4/2/2018	2.99	4/3/2028	4/2/2018	110.18087	105.9365867	101.9069987	98.07969966	94.443071	90.98623091	87.69898377	84.571773	81.59563754
180713A00031	7/13/2018	3.06	7/14/2025	7/13/2018	103.04448	101.616352	100.2218729	98.85996814	97.52961047	96.22981333	94.95962905	93.71814693	92.50449153
160908A00025	9/8/2016	2.21	9/8/2026	9/8/2016	105.21836	101.7292238	98.3810889	95.16747445	92.08223328	89.11953164	86.27383153	83.53987414	80.91266437
170407A00001	4/6/2017	2.97	4/6/2027	4/6/2017	108.86317	104.9718098	101.2541527	97.70139379	94.30522137	91.05778874	87.95168543	84.97991065	82.13584845
181003A00019	10/3/2018	3.44	10/3/2025	10/3/2018	107.2947	104.4650132	101.7270817	99.07742595	96.51271389	94.02975821	91.62550911	89.29704764	87.04157925
220308A00012	3/8/2022	2.51	3/8/2032	3/8/2022	110.9828	103.6738767	96.96914707	90.81354115	85.1573531	79.95568925	75.16797632	70.75752231	66.69112425
150320A00019	3/20/2015	2.25	3/20/2025	3/20/2015	103.00543	100.9851742	99.01878402	97.10448866	95.24059073	93.42545878	91.65752428	89.93527882	88.25727137
150803A00038	8/3/2015	3.41	8/2/2030	8/3/2015	116.2015	109.6485961	103.5583649	97.89456975	92.62403332	87.71636386	83.14370549	78.88051251	74.9033449
160608A00019	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.0044418	98.84203193	95.7997823	92.87242146	90.05494088	87.34258028	84.73081369	82.21533648
190826A00032	8/26/2019	1.72	8/24/2029	8/26/2019	103.90524	100.4410042	97.14554177	94.00899599	91.02215959	88.17643035	85.46376718	82.87664964	80.40804069
191008A00007	10/8/2019	1.67	10/9/2029	10/8/2019	103.81015	100.2686377	96.90325076	93.70350832	90.65963214	87.76249758	85.00358534	82.3749372	79.86911518
200319A00035	3/19/2020	1.72	3/18/2033	3/19/2020	105.43584	99.26028371	93.57945602	88.34792039	83.52478823	79.07323313	74.96006001	71.15532248	67.63198272
200910A00006	9/10/2020	0.96	9/10/2027	9/10/2020	101.37753	97.06800869	92.973319	89.08158848	85.38166176	81.86305306	78.51590266	75.33093647	72.29942829
190227A00033	2/27/2019	2.65	2/27/2026	2/27/2019	103.251	101.5256108	99.84701098	98.21355029	96.62365022	95.07579961	93.56855124	92.10051859	90.67037286
190403A00010	4/3/2019	3.08	4/3/2029	4/3/2019	113.68428	107.7258268	102.1395817	96.90001152	91.98346626	87.36803455	83.03340708	78.9607515	75.13259767
160524A00028	5/24/2016	2.06	5/24/2023	5/24/2016	100.67785	100.1184611	99.56531275	99.01829664	98.477311	97.94225632	97.41303528	96.88955266	96.3717153
160908A00035	9/8/2016	2.3	9/8/2031	9/8/2016	106.83128	102.2562602	97.96142914	93.92654354	90.13298913	86.56364137	83.20273567	80.03574962	77.04929623
161229A00018	12/29/2016	2.46	12/29/2026	12/29/2016	103.78082	101.6315533	99.55157535	97.53807301	95.58837222	93.69992629	91.87030885	90.0972074	88.3784171
181129A00005	11/29/2018	3.21	11/29/2023	11/29/2018	102.29035	101.2302754	100.1923958	99.1760139	98.18046476	97.20511055	96.24933931	95.3125636	94.39421932
191112A00024	11/12/2019	2.09	11/12/2024	11/12/2019	102.28286	100.3363105	98.43724342	96.58419719	94.77576143	93.01057924	91.28734468	89.60480046	87.96173578
180716A00062	7/16/2018	2.91	7/16/2025	7/16/2018	103.0141	101.583586	100.1868394	98.82278009	97.49037528	96.18863342	94.91660204	93.67336592	92.45804535
160824A00019	8/24/2016	1.98	8/25/2031	8/24/2016	105.95169	101.4386891	97.20052556	93.21744588	89.47128222	85.94531357	82.62414018	79.49356972	76.54051394
170713A00021	7/13/2017	3.25	7/13/2037	7/13/2017	123.01995	111.4955106	101.3500931	92.40207993	84.49520712	77.49486544	71.28496383	65.76526411	60.8491137
181115A00044	11/15/2018	3.26	11/15/2023	11/15/2018	102.21907	101.2043556	100.2101436	99.23581079	98.28076235	97.34442693	96.42625567	95.52572099	94.64231563
200317A00043	3/17/2020	1.29	3/15/2030	3/17/2020	102.54281	98.84498183	95.34051228	92.0173478	88.86428027	85.87088338	83.0274527	80.3249507	77.75495628
190708A00032	7/8/2019	2.58	7/2/2029	7/8/2019	110.94452	104.9056639	99.25701569	93.97091065	89.02180219	84.38608463	80.04193539	75.96917085	72.14911459

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210217A00005	2/17/2021	0.83	2/14/2031	2/17/2021	100.75642	96.69529824	92.86921101	89.26205659	85.85896605	82.64620282	79.6110685	76.74181702	74.02757649
210212A00006	2/12/2021	0.77	2/12/2026	2/12/2021	99.873845	96.87467073	93.98305695	91.19452722	88.5048191	85.90987268	83.40581956	80.98897257	78.65581608
160705A00010	7/5/2016	1.68	7/5/2023	7/5/2016	100.49457	99.82505011	99.16447822	98.51267665	97.86947129	97.23469261	96.60817553	95.98975926	95.37928715
190708A00026	7/8/2019	2.21	7/1/2024	7/8/2019	101.99138	100.3813458	98.8046953	97.26045358	95.74768026	94.2654714	92.81295769	91.38930285	89.99370198
210423A00003	4/23/2021	1.31	4/23/2031	4/23/2021	102.83211	98.60865202	94.63391025	90.89055937	87.36262794	84.03537936	80.89520768	77.92954285	75.12676447
151113A00035	11/13/2015	1.8	11/14/2022	11/13/2015	100.07647	100.0375912	99.99876162	99.9599788	99.92124262	99.88255299	99.84390983	99.80531305	99.76676255
160307A00024	3/7/2016	2.17	3/6/2026	3/7/2016	102.24617	100.5015457	98.8049692	97.15472558	95.54917732	93.98675716	92.4659645	90.98536207	89.54357283
200501A00009	5/4/2020	0.67	5/1/2025	5/4/2020	99.615586	98.31605674	97.04587437	95.80413506	94.58996982	93.40254333	92.2410523	91.10472401	89.99281488
151223A00036	12/23/2015	2.64	12/23/2025	12/23/2015	103.53118	101.5230081	99.57707498	97.69097864	95.86242422	94.08922173	92.36928044	90.7006036	89.08128355
190605A00023	6/5/2019	2.64	6/5/2029	6/5/2019	111.23502	105.2426076	99.63371292	94.38139936	89.4607721	84.84880973	80.52421349	76.46726937	72.65972208
141015A00029	10/15/2014	2.32	10/15/2024	10/15/2014	102.56612	100.870055	99.213189	97.5943545	96.01243049	94.46633696	92.95503311	91.47751559	90.03281687
200406A00029	4/6/2020	1.61	4/5/2030	4/6/2020	105.08869	98.74987513	92.86227736	87.39093951	82.30379357	77.57141175	73.16677608	69.06506922	65.24348447
210809A00013	8/9/2021	1.05	8/7/2026	8/9/2021	101.04849	97.73699904	94.55709893	91.50276935	88.56830736	85.74830429	83.03762859	80.43140984	77.92502372
150414A00037	4/14/2015	2.34	4/14/2025	4/14/2015	101.80406	100.5159341	99.25629796	98.0242878	96.81907075	95.63984597	94.48584315	93.35632103	92.25056611
180717A00021	7/17/2018	3.34	7/17/2028	7/17/2018	112.85386	107.892093	103.2024002	98.76802305	94.57333676	90.60376562	86.8457067	83.28645922	79.91415954
150604A00039	6/4/2015	2.82	6/4/2030	6/4/2015	108.7725	104.7249801	100.8952304	97.26931397	93.83429322	90.57815537	87.48973998	84.55867251	81.77530353
200406A00032	4/6/2020	1.09	4/4/2025	4/6/2020	100.45151	98.18014303	95.97246553	93.8263317	91.73968145	89.71053599	87.73699417	85.81722891	83.94948384
221018A00007	10/18/2022	4.68	10/18/2027	10/18/2022	110.25927	107.5452134	104.9324139	102.4162161	99.99221588	97.65624233	95.40434379	93.23277476	91.13798383
131018A00006	10/18/2013	3.28	10/20/2025	10/18/2013	106.72993	104.0807495	101.5167126	99.03457268	96.63122357	94.30369548	92.04914836	89.86486537	87.74824679
140821A00030	8/21/2014	2.27	8/21/2024	8/21/2014	101.35667	100.3993843	99.45995939	98.53789077	97.63269661	96.74391321	95.87109415	95.01380948	94.17164493
170201A00016	2/1/2017	2.49	2/1/2024	2/1/2017	101.91927	100.6933413	99.4967883	98.32855687	97.18764572	96.07310036	94.98401039	93.91950698	92.87876053
150617A00018	6/17/2015	2.45	6/17/2025	6/17/2015	102.08966	100.715484	99.37303599	98.06131878	96.77937788	95.52629625	94.30119249	93.1032192	91.93156132
170322A00033	3/22/2017	3.61	3/24/2042	3/22/2017	123.31945	112.3467645	102.7111214	94.22535054	86.73077632	80.09261639	74.19615577	68.94356354	64.25123973
190315A00017	3/15/2019	2.88	3/15/2034	3/15/2019	112.32469	106.2350649	100.6098817	95.40783039	90.5916605	86.12774919	81.98572029	78.13810586	74.56004526
150617A00030	6/17/2015	2.91	6/16/2025	6/17/2015	104.87143	102.4819405	100.162343	97.91014173	95.72294446	93.59846075	91.53449692	89.52895118	87.57980911
160413A00021	4/13/2016	2.48	4/13/2026	4/13/2016	105.39937	102.2341492	99.18584758	96.24948928	93.42033372	90.69386757	88.06579256	85.532014	83.08862998
170619A00096	6/16/2017	2.79	6/16/2027	6/16/2017	108.95138	104.7381706	100.7227744	96.89471697	93.24413738	89.76175021	86.43880869	83.26707029	80.23876476
191004A00023	10/4/2019	2.02	10/4/2029	10/4/2019	107.63661	101.5483849	95.8675811	90.56441745	85.61144452	80.98335283	76.65679542	72.610226	68.82375118
210611A00007	6/11/2021	0.61	6/11/2024	6/11/2021	99.371901	97.84925454	96.35751753	94.89580886	93.46328112	92.05911861	90.68253591	89.33277639	88.00911094
160608A00024	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.0044419	98.84203191	95.79978219	92.87242124	90.05494058	87.34257989	84.73081322	82.21533594
170317A00044	3/17/2017	3.11	3/17/2027	3/17/2017	109.29462	105.4326982	101.7412607	98.21175841	94.83611842	91.6067141	88.51633817	85.55817742	82.7257891
191101A00004	11/1/2019	1.91	11/1/2029	11/1/2019	107.21541	101.5642391	96.28276179	91.3441474	86.72367228	82.39853913	78.34771674	74.55179376	70.99284541
160810A00029	8/10/2016	2.17	8/10/2026	8/10/2016	104.9436	101.5251716	98.24246013	95.08927116	92.0597287	89.14825911	86.34957354	83.65865157	81.07072586

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180925A00116	9/25/2018	3.28	9/25/2028	9/25/2018	108.25531	105.112931	102.1058924	99.22712307	96.46997821	93.82820738	91.2959283	88.86760272	86.5380139
190529A00061	5/29/2019	2.46	5/29/2026	5/29/2019	102.92472	101.0848397	99.29757439	97.56099347	95.87325006	94.23257836	92.63728955	91.08576785	89.57646681
150825A00008	8/25/2015	2.82	8/25/2025	8/25/2015	104.99547	102.4509058	99.9849518	97.59472206	95.27745051	93.0304887	90.85130009	88.73745462	86.68662357
180206A00048	2/6/2018	2.72	2/6/2023	2/6/2018	100.61477	100.3441192	100.0749337	99.80719808	99.54090054	99.2760295	99.01257349	98.75052116	98.48986129
200330A00047	3/30/2020	1.5	3/30/2035	3/30/2020	103.16603	97.14203608	91.61141291	86.5271704	81.8472429	77.53393849	73.5534498	69.87542297	66.47257728
210913A00014	9/13/2021	1.15	9/13/2028	9/13/2021	101.20036	98.27044896	95.46644066	92.78177641	90.21028721	87.7461693	85.38396001	83.11851543	80.94498967
110701A00011	7/1/2011	3.87	7/1/2026	7/1/2011	105.87604	103.9008627	101.9840898	100.1235216	98.31705353	96.56267571	94.85846774	93.20259421	91.59330027
190131A00023	1/31/2019	3.02	1/30/2034	1/31/2019	113.04942	107.0038961	101.413562	96.23842313	91.44236848	86.99276335	82.86008831	79.01761795	75.44113486
210714A00012	7/14/2021	1.12	7/14/2026	7/14/2021	101.28072	97.94231153	94.73559231	91.65458187	88.69361324	85.84731048	83.11057171	80.47855333	77.94665521
151124A00007	11/24/2015	1.98	11/23/2022	11/24/2015	100.13071	100.0669076	100.0031945	99.93957324	99.8760437	99.81260565	99.74925891	99.68600328	99.62283856
160104A00020	1/4/2016	2.47	1/4/2023	1/4/2016	100.3989	100.2189508	100.0396502	99.86099499	99.68298173	99.50560694	99.32886719	99.15275905	98.97727915
191009A00009	10/9/2019	1.8	10/9/2026	10/9/2019	101.94902	99.92433631	97.96267123	96.06154452	94.21859341	92.43156474	90.69830904	89.01677508	87.38500465
151229A00026	12/29/2015	2.28	12/29/2025	12/29/2015	102.45497	100.8251522	99.23788892	97.69172744	96.18527167	94.71718381	93.28618138	91.89103458	90.53056362
160412A00029	4/12/2016	2.48	4/14/2031	4/12/2016	107.40866	103.0128056	98.87515474	94.97776974	91.30410323	87.83888454	84.56801214	81.47845588	78.55816804
160923A00009	9/23/2016	2.24	9/23/2031	9/23/2016	106.5498	101.9864165	97.70255415	93.67801168	89.89421581	86.33408015	82.98187551	79.8231124	76.84443448
191112A00022	11/12/2019	2.36	11/13/2029	11/12/2019	109.84592	103.5765508	97.73171458	92.27997998	87.19241348	82.44236723	78.00528683	73.85853626	69.98123835
171204A00024	12/4/2017	2.71	12/4/2024	12/4/2017	103.63324	101.6175337	99.65184806	97.73459806	95.86426473	94.03938839	92.25856581	90.52044759	88.82373565
200309A00081	3/9/2020	1.18	3/8/2030	3/9/2020	102.30812	96.15829557	90.44319842	85.12940776	80.18625041	75.58555741	71.30144745	67.31012998	63.58972627
150803A00033	8/3/2015	3.41	8/2/2030	8/3/2015	116.2015	109.648596	103.5583649	97.89456975	92.62403335	87.7163639	83.14370555	78.88051259	74.90334499
151125A00037	11/25/2015	2.41	11/25/2025	11/25/2015	102.38486	100.8005548	99.2567501	97.75208542	96.2852535	94.85500093	93.46012541	92.0994733	90.77193726
160328A00038	3/28/2016	2.54	3/30/2026	3/28/2016	105.29778	102.2780435	99.36737	96.56119268	93.85515866	91.24512067	88.7271263	86.29740766	83.95237179
181010A00025	10/10/2018	3.48	10/10/2030	10/10/2018	111.96365	107.6248735	103.5283565	99.65804475	95.99907914	92.53769724	89.26114474	86.15759457	83.21607299
190905A00021	9/5/2019	2.08	9/5/2029	9/5/2019	107.97543	101.9320711	96.28890964	91.01699266	86.08961398	81.48212786	77.17177991	73.13755279	69.36002511
200612A00004	6/12/2020	1.42	6/12/2040	6/12/2020	101.47621	93.02678397	85.53828804	78.8849363	72.95888012	67.66748725	62.93105547	58.68088708	54.85766502
160126A00004	1/26/2016	2.52	1/26/2026	1/26/2016	105.63517	102.5731678	99.61896766	96.76809505	94.0162965	91.35952291	88.79391817	86.31580851	83.92169251
181119A00008	11/19/2018	3.23	11/17/2023	11/19/2018	102.19885	101.1913315	100.2041392	99.23665629	98.2882926	97.35848117	96.44667739	95.55235786	94.67501934
190708A00029	7/8/2019	2.57	7/2/2029	7/8/2019	110.88313	104.8469239	99.20076566	93.91700756	88.97011243	84.33648337	79.99430592	75.92340399	72.10510818
160713A00015	7/13/2016	1.57	7/13/2026	7/13/2016	101.59094	99.69074166	97.84686896	96.0571935	94.319681	92.63238879	90.99346109	89.40112439	87.85368326
220211A00010	2/11/2022	1.99	2/11/2025	2/11/2022	101.82582	100.1336035	98.48310204	96.87297384	95.30193175	93.76874002	92.27221174	90.81120653	89.38462831
180322A00044	3/22/2018	3.18	3/22/2033	3/22/2018	113.23349	107.599407	102.3617619	97.48790105	92.9481481	88.71551394	84.76543355	81.07553014	77.62540381
200605A00018	6/5/2020	0.91	6/5/2025	6/5/2020	100.06376	97.65094996	95.3095041	93.03687633	90.83062512	88.68841216	86.60799722	84.58723332	82.62406216
210512A00011	5/12/2021	1.16	5/12/2026	5/12/2021	101.27071	98.07394132	94.99870737	92.03970556	89.19189213	86.45047105	83.81088036	81.26877935	78.82003657
171204A00009	12/4/2017	2.23	12/4/2024	12/4/2017	101.50648	100.4233495	99.36180294	98.32122054	97.30100674	96.30058828	95.31941314	94.35694957	93.41268515

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
181226A00030	12/26/2018	2.91	12/26/2028	12/26/2018	107.39787	104.1536902	101.0542464	98.09173623	95.25883631	92.54867061	89.95478004	87.47109429	85.09190579
200103A00002	1/3/2020	2.07	1/3/2030	1/3/2020	108.2352	102.4243086	97.0007498	91.9358839	87.203362	82.77892783	78.64024	74.76671029	71.13935643
170707A00007	7/7/2017	2.65	7/8/2024	7/7/2017	102.73015	101.0982395	99.50041981	97.93568461	96.40306491	94.9016297	93.43048409	91.98876752	90.57565211
180925A00013	9/25/2018	3.41	9/25/2028	9/25/2018	108.21835	105.0855793	102.0874512	99.21694579	96.46746441	93.83279907	91.30710683	88.88488583	86.56095305
190829A00039	8/29/2019	1.85	8/29/2034	8/29/2019	106.17131	100.2183716	94.73407268	89.67544716	85.00387635	80.68461251	76.68636092	72.98090986	69.54280273
191206A00005	12/6/2019	2.18	12/7/2026	12/6/2019	105.73728	101.9166244	98.26034665	94.76043535	91.40931871	88.1998348	85.12520687	82.17902042	79.35520169
200430A00027	4/30/2020	1.31	4/30/2035	4/30/2020	101.95712	95.96654204	90.46950032	85.4187224	80.77191678	76.49121298	72.54266452	68.89581124	65.5232933
200512A00013	5/12/2020	1.17	5/12/2027	5/12/2020	102.12325	98.053863	94.17569775	90.47870401	86.95341438	83.59090715	80.38277192	77.32107748	74.39834197
200716A00004	7/16/2020	0.97	7/16/2027	7/16/2020	101.36867	97.18043857	93.19530492	89.4022551	85.79093355	82.35160246	79.07510125	75.95280885	72.97660876
181218A00040	12/18/2018	3.23	6/18/2030	12/18/2018	109.87623	105.8000746	101.9427743	98.29034276	94.82979927	91.54908971	88.43701382	85.4831588	82.67783851
190905A00025	9/5/2019	2.08	9/5/2029	9/5/2019	107.97543	101.9320706	96.28891037	91.01699452	86.08961689	81.48213173	77.17178467	73.13755836	69.36003143
200327A00084	3/27/2020	1.1	3/27/2025	3/27/2020	100.45126	98.25558469	96.12055099	94.04413931	92.02440853	90.05949344	88.14760132	86.28700861	84.47605788
220801A00066	8/1/2022	2.93	7/30/2027	8/1/2022	110.67828	106.1947503	101.9282611	97.86699611	93.9998578	90.3164143	86.80685563	83.46195275	80.27301963
150729A00028	7/29/2015	2.25	7/29/2025	7/29/2015	102.05859	100.6402433	99.25540588	97.90301095	96.58203213	95.29148402	94.03042016	92.79793117	91.59314295
180305A00030	3/5/2018	3.12	3/5/2025	3/5/2018	105.05917	102.7917384	100.5857549	98.43921039	96.35017711	94.31680075	92.33729753	90.40995094	88.53310892
200413A00009	4/13/2020	0.77	4/13/2027	4/13/2020	100.18747	97.95335861	95.79583848	93.71163942	91.69765526	89.75093424	87.86867018	86.04819438	84.28696786
180612A00012	6/12/2018	2.94	6/12/2023	6/12/2018	100.83324	100.4622488	100.0946221	99.73031199	99.36926889	99.01144435	98.65679093	98.30526214	97.95681246
221012A00053	10/12/2022	4.66	10/11/2024	10/12/2022	103.89227	102.8298679	101.7880856	100.7663439	99.7640824	98.78076139	97.81586106	96.86888049	95.9393368
160523A00086	5/23/2016	2.2	5/26/2026	5/23/2016	104.91024	101.7724178	98.75237418	95.84497554	93.04534149	90.34883245	87.75103626	85.24775561	82.83499629
170921A00055	9/21/2017	2.82	9/21/2027	9/21/2017	109.53957	105.0988388	100.8765059	96.86054907	93.03967556	89.40327046	85.94135237	82.64453239	79.50397592
180104A00041	1/4/2018	3.08	1/4/2033	1/4/2018	117.78976	108.9580399	100.9311969	93.62926838	86.98072584	80.92154123	75.39435996	70.3477693	65.73565078
160210A00054	2/10/2016	1.78	2/10/2026	2/10/2016	101.72632	100.0275821	98.37485333	96.76651623	95.20101882	93.67687547	92.19266349	90.74701996	89.33863877
151013A00033	10/13/2015	2.23	10/14/2025	10/13/2015	102.02875	100.4916994	98.99313731	97.53179027	96.10643515	94.7158985	93.35905417	92.03482101	90.74216075
160603A00029	6/3/2016	2.18	6/3/2031	6/3/2016	106.78895	102.3224861	98.12347323	94.17299104	90.45361661	86.94929388	83.64521666	80.52772246	77.58419602
190813A00057	8/13/2019	1.9	8/13/2024	8/13/2019	101.60471	99.89322838	98.21911935	96.58128509	94.97866684	93.41024604	91.87504244	90.3721123	88.90054665
191203A00010	12/3/2019	2.21	12/3/2029	12/3/2019	108.92013	102.6501098	96.80768436	91.36099075	86.28071113	81.53985867	77.11358028	72.97897695	69.11494016
200406A00014	4/6/2020	1.33	4/6/2035	4/6/2020	102.9567	96.88233227	91.30972973	86.1907315	81.48226064	77.14575146	73.1466415	69.45392427	66.03975496
160115A00011	1/15/2016	2.18	1/15/2026	1/15/2016	102.1364	100.4748317	98.85737236	97.2824882	95.7487147	94.25464911	92.79894728	91.38032079	89.99753418
170124A00017	1/24/2017	2.82	1/23/2032	1/24/2017	110.25819	105.3528758	100.7585684	96.45205019	92.41203597	88.61899716	85.05500404	81.70358324	78.54958894
151201A00004	12/1/2015	2.44	12/1/2022	12/1/2015	100.21254	100.1265532	100.0407131	99.95502013	99.869474	99.78407432	99.69882073	99.61371287	99.52875038
160608A00034	6/8/2016	2.44	6/9/2031	6/8/2016	107.3355	102.8611193	98.65403836	94.69538972	90.9677914	87.4552226	84.14290742	81.01720929	78.06553498
190131A00013	1/31/2019	3.48	1/31/2034	1/31/2019	121.17216	111.4215323	102.631542	94.69894719	87.53226779	81.05038043	75.18128884	69.86104627	65.03281067
200406A00035	4/6/2020	1.05	4/4/2025	4/6/2020	100.32867	98.17906278	96.0888367	94.05599902	92.0786396	90.15492362	88.2830881	86.46143866	84.68834637

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160203A00017	2/3/2016	2.07	2/3/2023	2/3/2016	100.42772	100.1655124	99.90467336	99.64519329	99.38706158	99.13026775	98.87480144	98.62065237	98.36781039
161116A00006	11/16/2016	2.39	11/16/2026	11/16/2016	103.26224	101.1700538	99.14409145	97.1817072	95.28038394	93.43772269	91.65143625	89.9193432	88.23936227
171219A00009	12/19/2017	2.3	12/19/2024	12/19/2017	101.64834	100.5238381	99.42219268	98.34274514	97.28485745	96.24791571	95.23132891	94.23452788	93.2569643
180717A00026	7/17/2018	3.24	7/16/2025	7/17/2018	105.98337	103.4565534	101.0057861	98.62826698	96.32132245	94.08239657	91.90904485	89.79892847	87.74980886
200110A00037	1/10/2020	2.32	1/10/2030	1/10/2020	109.6853	103.3032006	97.36129986	91.82641579	86.66804986	81.85815743	77.3709373	73.18264046	69.2713961
161014A00026	10/14/2016	2.16	10/14/2031	10/14/2016	106.87742	102.2439959	97.89736504	93.81659988	89.98247561	86.3773203	82.98487831	79.79018663	76.7794628
170804A00005	8/4/2017	1.94	8/5/2024	8/4/2017	101.03265	100.0803533	99.14577828	98.22842488	97.32781298	96.44348074	95.57498372	94.721894	93.88379942
191004A00019	10/4/2019	2.02	10/4/2029	10/4/2019	107.63661	101.548385	95.86758078	90.56441675	85.61144347	80.98335147	76.65679378	72.6102241	68.82374904
170309A00042	3/9/2017	2.18	3/11/2024	3/9/2017	100.99389	100.2465596	99.51199937	98.78986108	98.0798089	97.38151966	96.69468223	96.01899692	95.35417491
200512A00021	5/12/2020	0.86	5/12/2025	5/12/2020	99.928084	97.57472395	95.28978281	93.07086502	90.91567429	88.822009	86.78775763	84.81089448	82.88947557
121114A00020	11/14/2012	1.74	11/14/2022	11/14/2012	100.07413	100.0352595	99.99643197	99.95765114	99.91891696	99.88022933	99.84158816	99.80299337	99.76444486
140730A00037	7/30/2014	2.83	1/30/2024	7/30/2014	101.33524	100.6646391	100.0053714	99.35711719	98.71957006	98.09243548	97.47543029	96.86828219	96.27072912
141017A00022	10/17/2014	2.78	10/17/2024	10/17/2014	103.3592	101.5446719	99.77273745	98.04212177	96.35160119	94.69999673	93.08617216	91.50903215	89.96752049
170619A00095	6/16/2017	2.79	6/16/2027	6/16/2017	108.95139	104.7381725	100.7227749	96.89471626	93.2441355	89.76174725	86.4388047	83.26706534	80.23875892
191004A00022	10/4/2019	2.02	10/4/2029	10/4/2019	107.63662	101.5483855	95.86757923	90.56441339	85.61143848	80.98334499	76.65678596	72.61021507	68.82373892
210611A00012	6/11/2021	1.02	6/11/2026	6/11/2021	100.86764	97.61362789	94.48550658	91.47767779	88.5848276	85.80190859	83.12412472	80.54691731	78.06595172
170406A00024	4/6/2017	2.61	4/8/2024	4/6/2017	102.22115	100.8357596	99.47632654	98.14218205	96.83267964	95.54719443	94.28512227	93.04587884	91.82889891
200323A00090	3/23/2020	1.55	3/23/2027	3/23/2020	101.85897	99.45362989	97.13431972	94.89724918	92.73882161	90.65562325	88.64441265	86.70211087	84.82579227
170524A00037	5/24/2017	2.46	5/24/2024	5/24/2017	102.15455	100.6749522	99.22472767	97.80306228	96.40917134	95.04229867	93.70171521	92.38671789	91.09662836
200303A00028	3/3/2020	1.54	3/4/2030	3/3/2020	104.28952	98.57489738	93.24868236	88.2816758	83.64704185	79.3201034	75.27815732	71.50030639	67.96730634
160414A00042	4/13/2016	2.48	4/13/2026	4/13/2016	105.39937	102.2341492	99.18584758	96.24948929	93.42033374	90.6938676	88.0657926	85.53201404	83.08863003
190802A00011	8/2/2019	2.01	8/2/2029	8/2/2019	104.94217	101.444215	98.11661595	94.94942311	91.93334654	89.0597067	86.32039006	83.70780827	81.21486058
160629A00066	6/29/2016	2.61	6/30/2036	6/29/2016	115.34481	105.0546953	95.92976217	87.82502472	80.61462253	74.1891828	68.45356096	63.32490278	58.73098078
200206A00027	2/6/2020	2.15	2/6/2030	2/6/2020	108.609	102.2211482	96.27812883	90.74611951	85.59405396	80.79338511	76.31786753	72.14335982	68.24764499
140703A00026	7/3/2014	3.11	7/3/2024	7/3/2014	103.3561	101.7863001	100.2489093	98.74297269	97.26757755	95.82184654	94.40493603	93.01603449	91.65436087
160608A00023	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.0044418	98.84203193	95.79978232	92.87242147	90.05494091	87.34258032	84.73081373	82.21533653
170224A00009	2/24/2017	2.39	2/24/2023	2/24/2017	100.59406	100.2745322	99.95703907	99.6415607	99.32807793	99.01657185	98.7070238	98.39941536	98.09372834
180913A00033	9/13/2018	3.31	9/13/2033	9/13/2018	114.48919	108.5370463	103.0213106	97.9045993	93.1530715	88.73606646	84.62578069	80.79698007	77.22674287
150729A00041	7/29/2015	2.44	7/29/2025	7/29/2015	102.14777	100.7308121	99.34727194	97.99608952	96.67624277	95.38675031	94.12666945	92.89509439	91.69115443
180907A00013	9/7/2018	3.27	9/8/2025	9/7/2018	106.54768	103.8285571	101.195475	98.64523666	96.17478492	93.78119237	91.46165511	89.21348683	87.03411322
160908A00016	9/8/2016	1.87	9/8/2023	9/8/2016	100.70687	99.87026344	99.04765672	98.23870311	97.44306374	96.66041091	95.89042761	95.13280709	94.38725245
190620A00033	6/20/2019	2.1	6/20/2029	6/20/2019	105.14178	101.7186642	98.45880482	95.35285003	92.39205503	89.56823944	86.873747	84.30140837	81.84450689
200309A00082	3/9/2020	1.18	3/8/2030	3/9/2020	102.30811	96.15829593	90.44319925	85.12940902	80.18625206	75.58555941	71.30144977	67.31013259	63.58972914

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200309A00084	3/9/2020	1.06	3/9/2027	3/9/2020	101.55093	97.63964754	93.90596336	90.34086819	86.93585228	83.68287878	80.57435508	77.60310599	74.76234875
210212A00007	2/12/2021	0.76	2/12/2026	2/12/2021	99.839798	96.87940801	94.02477188	91.27149678	88.61539943	86.05249511	83.57898688	81.19125546	78.8858498
210512A00012	5/12/2021	1.16	5/12/2026	5/12/2021	101.27071	98.07394145	94.99870777	92.03970621	89.19189302	86.45047217	83.81088169	81.2687809	78.82003831
160908A00023	9/8/2016	2.21	9/8/2026	9/8/2016	105.21836	101.7292237	98.38108894	95.16747462	92.08223357	89.11953204	86.27383204	83.53987476	80.91266508
190403A00014	4/3/2019	3.05	4/3/2029	4/3/2019	113.08638	107.3212393	101.9122987	96.83526163	92.06762334	87.58852726	83.37863592	79.42001261	75.69601281
190712A00016	7/12/2019	2.39	7/12/2029	7/12/2019	105.73617	102.2629054	98.95668005	95.80784787	92.80739713	89.94690184	87.21847963	84.61475299	82.12881343
200512A00001	5/12/2020	1.17	5/12/2027	5/12/2020	102.12325	98.053863	94.17569767	90.47870386	86.95341416	83.59090687	80.38277158	77.3210771	74.39834153
201110A00003	11/10/2020	1.12	11/10/2027	11/10/2020	102.15884	97.69131051	93.4531099	89.43117584	85.61326386	81.98788759	78.54426788	75.27228547	72.1624372
120806A00015	8/6/2012	2.38	8/6/2027	8/6/2012	103.9522	101.4756136	99.0888357	96.78784191	94.5688158	92.42813898	90.36237943	88.36828063	86.44275133
160606A00018	6/6/2016	1.74	6/5/2026	6/6/2016	101.8671	100.0030168	98.19322601	96.43570118	94.72850967	93.06980478	91.45782128	89.89087118	88.36733985
191113A00013	11/13/2019	2.17	11/13/2026	11/13/2019	105.57833	101.8183678	98.21818268	94.77008628	91.46680519	88.30145421	85.26751334	82.35880637	79.56948083
150603A00032	6/3/2015	2.21	6/3/2025	6/3/2015	101.93082	100.557476	99.21585785	97.90496872	96.62385404	95.37159671	94.14731528	92.95016227	91.77932261
160511A00016	5/11/2016	2.48	5/12/2031	5/11/2016	107.46413	103.0251895	98.84921448	94.91778575	91.21392683	87.72198087	84.42749873	81.31713725	78.37856675
190910A00044	9/10/2019	2.02	9/10/2026	9/10/2019	104.71737	101.1279517	97.68534108	94.38274571	91.21372527	88.17216913	85.25227779	82.44854536	79.7557432
151102A00024	11/2/2015	2.37	11/2/2022	11/2/2015	100.01337	100.0078159	100.0022708	99.99673048	99.9911949	99.98566406	99.98013797	99.97461662	99.96909999
160211A00038	2/11/2016	1.83	2/11/2026	2/11/2016	101.59046	99.89725307	98.24982981	96.64658276	95.08596997	93.56651525	92.08680482	90.64548421	89.24125529
200318A00012	3/18/2020	1.68	3/18/2033	3/18/2020	105.18232	99.02240589	93.35599286	88.13775309	83.32689837	78.88669287	74.78402324	70.98901688	67.47470271
220310A00008	3/10/2022	2.22	3/10/2025	3/10/2022	103.00745	100.7648445	98.58336757	96.46101802	94.39586785	92.38606314	90.42982073	88.52542516	86.67122563
160908A00030	9/8/2016	2.21	9/8/2026	9/8/2016	105.21836	101.7292237	98.38108894	95.16747461	92.08223356	89.11953203	86.27383202	83.53987474	80.91266506
160908A00028	9/8/2016	2.21	9/8/2026	9/8/2016	105.21836	101.7292238	98.38108891	95.16747449	92.08223334	89.11953173	86.27383164	83.53987428	80.91266453
200221A00012	2/21/2020	2.14	2/21/2040	2/21/2020	107.94086	99.20735387	91.45134148	84.5468742	78.38568412	72.8745447	67.93304517	63.49171084	59.49041337
210331A00007	3/31/2021	1.25	3/31/2031	3/31/2021	101.96156	97.82623245	93.93179852	90.26164529	86.80044519	83.53404476	80.44936641	77.53431905	74.7777167
210915A00025	9/15/2021	1.09	9/15/2026	9/15/2021	101.26511	97.86553647	94.60431937	91.47506886	88.47171983	85.58851803	82.82000242	80.16098877	77.60655412
190905A00024	9/5/2019	2.08	9/5/2029	9/5/2019	107.97543	101.9320703	96.28891095	91.01699587	86.08961893	81.48213439	77.1717879	73.1375621	69.36003563
130206A00009	2/6/2013	2.83	2/7/2028	2/6/2013	108.68492	104.6031181	100.7225958	97.0319681	93.52056295	90.1783749	86.99601963	83.9646916	81.07612493
160401A00005	4/1/2016	2.02	4/3/2023	4/1/2016	100.55923	100.1366657	99.71766108	99.30216721	98.89014003	98.48153625	98.07631331	97.67442935	97.27584318
170106A00030	1/6/2017	2.39	1/6/2027	1/6/2017	103.71168	101.5237111	99.40733569	97.35961289	95.37774642	93.4590746	91.6010629	89.80129696	88.05747607
200206A00008	2/6/2020	1.64	2/6/2025	2/6/2020	101.83407	99.72779835	97.67687091	95.67944086	93.7337389	91.83806873	89.99080336	88.19038163	86.43530498
200406A00027	4/6/2020	1.31	4/5/2030	4/6/2020	103.73255	97.96914111	92.60241917	87.60219393	82.94075052	78.59263066	74.53443713	70.74465611	67.20349579
150714A00003	7/14/2015	3.76	7/12/2030	7/14/2015	112.8334	108.5831295	104.5639223	100.7608452	97.16005121	93.7486917	90.51483771	87.44740757	84.53610084
170619A00089	6/16/2017	2.79	6/16/2027	6/16/2017	108.95138	104.7381719	100.7227748	96.8947165	93.24413611	89.76174821	86.438806	83.26706695	80.23876082
200206A00038	2/6/2020	1.78	2/6/2023	2/6/2020	100.36012	100.0897032	99.8207487	99.55324388	99.28717701	99.02253652	98.75931093	98.49748888	98.23705915
151001A00023	10/1/2015	2.02	10/1/2025	10/1/2015	101.89878	100.3617097	98.86316022	97.40185193	95.97656032	94.58611071	93.22937578	91.9052733	90.61276396

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170105A00012	1/5/2017	2.68	1/5/2024	1/5/2017	101.89851	100.7433637	99.61462793	98.51140067	97.43282178	96.37806952	95.34635836	94.33693699	93.34908653
201221A00022	12/21/2020	0.51	12/19/2025	12/21/2020	99.426313	96.64846117	93.96571893	91.374254	88.87041332	86.45071366	84.11183257	81.85059979	79.66398928
150929A00076	9/29/2015	2.28	9/29/2025	9/29/2015	102.04469	100.547128	99.08636676	97.66119792	96.27046678	94.91306529	93.58792966	92.29403832	91.03040985
151029A00008	10/29/2015	2.28	10/29/2025	10/29/2015	102.10933	100.5699601	99.06918697	97.60572699	96.17835199	94.78588379	93.42719181	92.10119072	90.80683829
200110A00043	1/10/2020	2.32	1/10/2030	1/10/2020	109.6853	103.3032003	97.36130024	91.82641677	86.66805138	81.85815942	77.37093972	73.18264326	69.27139923
200414A00009	4/14/2020	0.82	4/14/2025	4/14/2020	99.815989	98.5529185	97.31778729	96.10974545	94.9279763	93.77169458	92.6401449	91.53260042	90.44836146
210714A00016	7/14/2021	0.75	7/12/2024	7/14/2021	99.591076	98.00421181	96.45063823	94.92936485	93.43944068	91.97995231	90.55002197	89.14880578	87.77549209
210809A00015	8/9/2021	1.06	8/7/2026	8/9/2021	101.1208	97.73367283	94.48212307	91.35992683	88.36118751	85.48031344	82.71200012	80.05121355	77.49317474
170802A00013	8/2/2017	2.5	8/2/2024	8/2/2017	102.60027	100.9078765	99.25188883	97.63120605	96.04476817	94.49155786	92.9705983	91.48095108	90.02171432
160329A00017	3/29/2016	2.48	3/30/2026	3/29/2016	105.11287	102.0974087	99.19087468	96.38870083	93.68653959	91.08024889	88.56588121	86.13967341	83.79803701
171207A00026	12/7/2017	2.93	12/7/2027	12/7/2017	110.7345	105.967243	101.4450107	97.15376902	93.08036259	89.21245766	85.5384865	82.04759553	78.7295974
200311A00015	3/11/2020	1.26	3/11/2027	3/11/2020	102.36903	98.4289947	94.6679583	91.0768252	87.64701256	84.37041501	81.23937558	78.24665869	75.3854248
161102A00014	11/2/2016	1.99	11/2/2023	11/2/2016	100.91547	99.93209823	98.96799475	98.02259914	97.09536964	96.18578527	95.29334481	94.41756586	93.55798402
170309A00014	3/9/2017	2.58	3/9/2027	3/9/2017	104.32999	102.0456651	99.83844929	97.70509226	95.64250636	93.6477557	91.71804766	89.85072484	88.0432576
190506A00026	5/6/2019	3.03	5/4/2029	5/6/2019	113.50037	107.4813166	101.842758	96.55827048	91.60341007	86.95555168	82.59374472	78.49858058	74.65207135
190913A00018	9/13/2019	2.11	9/11/2026	9/13/2019	102.52808	100.5326614	98.59832708	96.7227047	94.90353385	93.1386579	91.42601839	89.7636499	88.14967518
170727A00003	7/27/2017	1.97	7/29/2024	7/27/2017	101.01733	100.1032177	99.20584988	98.32475512	97.45948349	96.60960211	95.77469426	94.95435866	94.1482087
160210A00051	2/10/2016	2.28	2/10/2031	2/10/2016	107.03394	102.7209412	98.65751885	94.82656934	91.21230632	87.80014555	84.57660484	81.52921307	78.64642711
200109A00008	1/9/2020	1.95	1/9/2030	1/9/2020	104.99105	101.2869434	97.77272095	94.43676058	91.26824114	88.25708381	85.39389603	82.66992	80.0769854
200220A00026	2/20/2020	2.22	2/21/2040	2/20/2020	108.66266	99.86739429	92.05652207	85.10320689	78.8984174	73.34826958	68.37178548	63.89900033	59.86936152
200724A00011	7/24/2020	1.41	7/26/2038	7/24/2020	102.18334	91.66089482	82.50002201	74.50842259	67.52242836	61.40256764	56.02984108	51.30259014	47.13386108
160908A00019	9/8/2016	1.87	9/8/2023	9/8/2016	100.70687	99.87026343	99.04765672	98.2387031	97.44306373	96.6604109	95.8904276	95.13280708	94.38725243
181116A00006	11/16/2018	3.18	11/17/2025	11/16/2018	103.63475	102.0317788	100.4697716	98.9473455	97.46317937	96.01600643	94.60461156	93.22782872	91.88453868
160812A00006	8/12/2016	2.16	8/12/2026	8/12/2016	105.13915	101.8323102	98.65537572	95.60244792	92.66792995	89.84651184	87.13315393	84.52307136	82.01171958
210408A00007	4/8/2021	1.05	4/8/2031	4/8/2021	101.69605	97.519427	93.58872465	89.88681915	86.39792139	83.10746269	80.00199185	77.06908147	74.29724285
220310A00010	3/10/2022	2.31	3/10/2027	3/10/2022	106.61196	102.5885664	98.74666175	95.07705935	91.57108877	88.22056073	85.01773792	81.95530776	79.02635692
150929A00087	9/29/2015	2.09	9/29/2025	9/29/2015	101.95024	100.451247	98.98914337	97.56272511	96.17083271	94.81235353	93.48621952	92.19140504	90.92692486
170313A00045	3/13/2017	3.22	3/15/2032	3/13/2017	111.7071	106.6708514	101.9581258	97.54446721	93.40747876	89.52663357	85.8831052	82.45961439	79.24029073
160802A00026	8/2/2016	1.84	8/2/2023	8/2/2016	100.63856	99.89490972	99.16228614	98.44044551	97.72915073	97.02817161	96.33728461	95.65627263	94.98492473
170317A00040	3/17/2017	2.74	3/18/2024	3/17/2017	102.33037	100.9872649	99.66845817	98.37334164	97.10133022	95.85185769	94.62437595	93.41835426	92.23327859
190205A00021	2/5/2019	3.32	2/5/2029	2/5/2019	114.40358	108.7078202	103.3560255	98.32518219	93.59395044	89.14253124	84.95254649	81.0069292	77.28982281
180206A00046	2/6/2018	2.72	2/6/2023	2/6/2018	100.61477	100.3441192	100.0749337	99.80719809	99.54090055	99.27602951	99.0125735	98.75052118	98.48986131
210809A00016	8/9/2021	0.66	8/9/2024	8/9/2021	99.499249	98.01919658	96.57055143	95.15238543	93.76380707	92.40395936	91.07201809	89.76719029	88.48871271

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150701A00056	7/1/2015	2.34	7/1/2025	7/1/2015	102.18471	100.7668903	99.38249879	98.03046803	96.70977718	95.41944594	94.15853262	92.92613227	91.72137498
190813A00064	8/13/2019	1.9	8/13/2024	8/13/2019	101.60471	99.89322839	98.21911944	96.58128527	94.9786671	93.41024637	91.87504285	90.37211278	88.9005472
201029A00004	10/29/2020	1.49	10/29/2038	10/29/2020	102.92473	92.23177558	82.93841498	74.84453915	67.78020474	61.60090271	56.18359642	51.42339745	47.23077352
210714A00009	7/14/2021	0.75	7/12/2024	7/14/2021	99.587251	97.98551338	96.41743221	94.882005	93.37826968	91.90530221	90.46221464	89.04815331	87.66229718
190329A00067	3/29/2019	2.61	3/29/2024	3/29/2019	102.12761	100.8011529	99.49906258	98.22071959	96.96552587	95.73290303	94.52229164	93.33315039	92.16495537
160201A00016	2/1/2016	2.1	2/2/2026	2/1/2016	102.05902	100.3586969	98.70432443	97.09428662	95.52703615	94.00109178	92.51503494	91.06750661	89.65720438
160908A00024	9/8/2016	2.21	9/8/2026	9/8/2016	105.21836	101.7292237	98.38108894	95.16747462	92.08223358	89.11953206	86.27383206	83.53987478	80.91266511
181218A00089	12/18/2018	3.05	6/19/2023	12/18/2018	101.33803	100.7148407	100.099417	99.49161119	98.89128172	98.29829054	97.71250302	97.13378782	96.56201674
200522A00009	5/22/2020	0.96	5/22/2030	5/22/2020	100.73352	97.02696396	93.52214312	90.20600371	87.06644192	84.09222775	81.27293574	78.5988818	76.06106531
200512A00018	5/12/2020	0.85	5/12/2025	5/12/2020	99.900993	97.60958413	95.38429996	93.22283209	91.12296798	89.0825862	87.09965204	85.17221334	83.29839657
150219A00016	2/19/2015	2.68	2/19/2025	2/19/2015	103.73166	101.6107378	99.54555803	97.53430445	95.57523314	93.66666836	91.8069994	89.99467756	88.22821333
161229A00019	12/29/2016	2.46	12/29/2026	12/29/2016	103.78082	101.6315534	99.55157534	97.53807296	95.58837215	93.69992618	91.87030871	90.09720724	88.3784169
190205A00022	2/5/2019	3.32	2/5/2029	2/5/2019	114.40358	108.7078216	103.3560261	98.325182	93.59394953	89.14252967	84.95254431	81.00692646	77.28981956
110719A00017	7/19/2011	3.68	7/20/2026	7/19/2011	105.50091	103.5315061	101.6203905	99.76536451	97.96432541	96.21526512	94.51626519	92.86549219	91.26119329
180302A00014	3/2/2018	2.69	3/2/2023	3/2/2018	100.48729	100.2770733	100.0679041	99.85977198	99.65266843	99.44658509	99.24151367	99.03744598	98.83437394
160908A00032	9/8/2016	2.17	9/8/2026	9/8/2016	104.84964	101.5027852	98.28936693	95.20329628	92.23879305	89.39037064	86.65281956	84.02119198	81.49078718
200512A00020	5/12/2020	0.86	5/12/2025	5/12/2020	99.928084	97.57472355	95.289782	93.07086383	90.91567272	88.82200706	86.78775534	84.81089185	82.88947262
201103A00005	11/3/2020	0.89	11/4/2030	11/3/2020	100.45597	96.53561107	92.835663	89.34142548	86.03929771	82.9166888	79.96193573	77.16422846	74.51354159
190104A00034	1/4/2019	3.18	1/4/2029	1/4/2019	111.43775	106.6904927	102.2089548	97.97619399	93.97645803	90.19509271	86.61845878	83.23385561	80.02945114
191112A00023	11/12/2019	2.36	11/13/2029	11/12/2019	109.84592	103.5765514	97.7317141	92.27997848	87.19241106	82.44236397	78.00528281	73.85853156	69.98123303
160106A00042	1/6/2016	2.43	1/6/2026	1/6/2016	102.56094	100.8931183	99.2695412	97.68867709	96.14905775	94.64927682	93.18798664	91.76389539	90.37576429
180906A00032	9/6/2018	3.24	9/5/2025	9/6/2018	106.53306	103.7873219	101.1285691	98.55357463	96.05925073	93.64264022	91.30091046	89.03134737	86.8313498
191008A00014	10/8/2019	1.85	10/8/2026	10/8/2019	104.20571	100.5650271	97.07597171	93.73140595	90.52456311	87.4490294	84.49872363	81.66787818	78.95102116
110909A00006	9/9/2011	2.26	9/9/2026	9/9/2011	102.83492	100.8336712	98.89367961	97.01256565	95.18806289	93.41800885	91.70033949	90.03308406	88.41436017
150824A00050	8/24/2015	2.03	8/25/2025	8/24/2015	101.7986	100.34317	98.92282934	97.53644112	96.18291706	94.86121254	93.57032454	92.3092896	91.07718193
200115A00013	1/15/2020	2.18	1/15/2030	1/15/2020	107.25689	102.0748801	97.22169002	92.67368862	88.40910146	84.40785156	80.65141699	77.12270122	73.80591501
160301A00012	3/1/2016	2.02	3/1/2023	3/1/2016	100.48866	100.1554612	99.82447122	99.49566701	99.169027	98.8445299	98.5221547	98.20188067	97.88368734
161214A00034	12/14/2016	2.65	12/14/2026	12/14/2016	103.9117	101.7651921	99.68771595	97.67647889	95.72882278	93.84221577	92.01424532	90.2426118	88.52512238
210512A00008	5/12/2021	0.66	5/10/2024	5/12/2021	99.440503	97.99620754	96.58032783	95.19209173	93.83075488	92.49559921	91.18593182	89.90108385	88.64040944
120517A00021	5/17/2012	1.85	5/17/2024	5/17/2012	100.82047	99.99157937	99.17732204	98.37730118	97.59113151	96.81844211	96.05887564	95.31208779	94.57774664
180322A00040	3/22/2018	3.16	3/21/2031	3/22/2018	112.8598	107.4594605	102.4170812	97.70522399	93.29876243	89.1746741	85.31185098	81.6909278	78.29412685
210714A00011	7/14/2021	0.75	7/12/2024	7/14/2021	99.587251	97.98551338	96.41743222	94.88200501	93.37826969	91.90530223	90.46221466	89.04815333	87.66229721
160908A00027	9/8/2016	2.21	9/8/2026	9/8/2016	105.21836	101.7292238	98.38108889	95.16747439	92.08223318	89.11953151	86.27383136	83.53987394	80.91266413

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190605A00024	6/5/2019	2.64	6/5/2029	6/5/2019	111.23501	105.2426065	99.63371293	94.38140043	89.46077414	84.84881268	80.52421727	76.46727393	72.65972736
150227A00011	2/27/2015	2.33	2/27/2025	2/27/2015	103.09628	101.1167972	99.18904215	97.31135215	95.48212431	93.69981704	91.9629473	90.27008796	88.61986542
190308A00016	3/8/2019	3.18	3/8/2034	3/8/2019	118.94366	109.7264071	101.4032957	93.8788189	87.06832077	80.89670213	75.29728806	70.21083502	65.58466004
190813A00052	8/13/2019	2.24	8/13/2029	8/13/2019	108.9325	102.8949313	97.2536907	91.98029339	87.04845675	82.4339187	78.11427181	74.06881196	70.27840001
220104A00006	1/4/2022	1.76	1/4/2029	1/4/2022	106.25449	101.0230041	96.10408163	91.47701982	87.12260424	83.02299502	79.16162096	75.52308231	72.09306154
190515A00035	5/15/2019	2.82	2/15/2029	5/15/2019	111.98271	106.1923529	100.7578132	95.6550501	90.86177737	86.35732619	82.12251922	78.1395552	74.39190317
200330A00058	3/30/2020	1.49	3/29/2030	3/30/2020	103.979	98.24281361	92.89942154	87.9190698	83.27442931	78.94038651	74.8938522	71.1135878	67.58004743
210107A00008	1/7/2021	0.54	1/5/2024	1/7/2021	99.397973	98.2653251	97.15862178	96.07697761	95.01954682	93.98552135	92.97412878	91.98463039	91.01631931
191209A00005	12/9/2019	2.22	12/10/2029	12/9/2019	108.25725	102.5109687	97.14399295	92.12853847	87.43902006	83.05186569	78.94534718	75.09942596	71.49561258
180104A00024	1/4/2018	2.98	1/4/2028	1/4/2018	110.79014	106.082769	101.6178802	97.38148827	93.36049384	89.54262387	85.91637457	82.47095881	79.19625741
200309A00034	3/9/2020	0.96	3/9/2035	3/9/2020	100.63427	94.73301821	89.31640668	84.33817456	79.75692125	75.53555873	71.64082842	68.04287552	64.7148735
191004A00025	10/4/2019	1.74	10/4/2024	10/4/2019	101.47788	99.63834341	97.84175647	96.0868531	94.37241615	92.69727213	91.06028927	89.4603758	87.89647821
200406A00037	4/6/2020	0.9	4/6/2023	4/6/2020	100.08009	99.65060566	99.2248162	98.80266976	98.38411966	97.96912003	97.55762574	97.14959246	96.7449766
150311A00003	3/11/2015	2.72	3/31/2025	3/11/2015	104.04626	101.8438886	99.70196384	97.61846726	95.5914641	93.61909557	91.69957528	89.83118603	88.01227663
190605A00007	6/5/2019	2.47	6/5/2026	6/5/2019	105.83485	102.4436643	99.18309653	96.04736299	93.03097196	90.12870579	87.33560556	84.64695665	82.05827515
200110A00039	1/10/2020	2.32	1/10/2030	1/10/2020	109.6853	103.3032002	97.36130042	91.82641724	86.66805212	81.85816041	77.37094093	73.18264466	69.27140082
210714A00013	7/14/2021	1.12	7/14/2026	7/14/2021	101.28072	97.94231103	94.73559079	91.65457938	88.69360983	85.8473062	83.1105666	80.47854744	77.94664857
210809A00012	8/9/2021	1.06	8/7/2026	8/9/2021	101.1208	97.73367271	94.48212272	91.35992627	88.36118674	85.48031248	82.71199897	80.05121222	77.49317325
150224A00010	2/24/2015	2.34	2/24/2025	2/24/2015	101.89869	100.553617	99.23844388	97.95227996	96.69426501	95.46357041	94.25939774	93.0809775	91.92756786
180718A00008	7/18/2018	3.37	7/18/2028	7/18/2018	114.18223	108.6692729	103.4678768	98.55850572	93.9229611	89.54428215	85.4066544	81.49532582	77.79652945
190103A00020	1/3/2019	3.12	1/5/2026	1/3/2019	107.00727	103.9548212	101.0082042	98.16310115	95.41540124	92.76118733	90.19672546	87.71845501	85.32297933
200818A00012	8/18/2020	0.97	8/18/2027	8/18/2020	101.40111	97.14098204	93.09079213	89.23902406	85.57485951	82.08812798	78.76926451	75.60927029	72.59967618
180813A00045	8/13/2018	2.89	8/13/2025	8/13/2018	103.08038	101.6076541	100.1704003	98.76746799	97.39775674	96.06021057	94.75381562	93.47759806	92.23062225
160209A00006	2/9/2016	1.91	2/9/2026	2/9/2016	101.72928	100.0339129	98.38438406	96.7790817	95.21646211	93.69504749	92.21342252	90.77023125	89.36417416
190205A00023	2/5/2019	3.32	2/5/2029	2/5/2019	114.40358	108.7078203	103.3560256	98.32518219	93.59395041	89.14253119	84.95254641	81.00692911	77.2898227
150617A00017	6/17/2015	2.27	6/17/2025	6/17/2015	102.01717	100.6414552	99.29755351	97.98446729	96.70123795	95.4469446	94.22070217	93.0216598	91.84899918
191203A00011	12/3/2019	2.21	12/3/2029	12/3/2019	108.92013	102.65011	96.80768413	91.36099018	86.28071024	81.53985749	77.11357883	72.97897526	69.11493825
160413A00020	4/13/2016	2.48	4/13/2026	4/13/2016	105.39937	102.2341492	99.18584757	96.24948925	93.42033366	90.69386749	88.06579245	85.53201386	83.08862982
210611A00008	6/11/2021	0.61	6/11/2024	6/11/2021	99.368064	97.8366517	96.33635347	94.86628248	93.42558549	92.01344122	90.62905885	89.27167659	87.94056031
170309A00016	3/9/2017	2.39	3/8/2024	3/9/2017	101.15253	100.404502	99.66924623	98.94641648	98.23567697	97.53670454	96.84918807	96.17282787	95.50733515
180905A00017	9/5/2018	3.43	9/6/2033	9/5/2018	121.8839	112.4204309	103.8621182	96.11452426	89.09365148	82.72473536	76.94118046	71.68362426	66.89911271
171013A00024	10/13/2017	2.47	10/15/2024	10/13/2017	102.82561	100.9932422	99.20395697	97.4564679	95.74953889	94.08197893	92.45264007	90.86041555	89.30423804
190702A00071	7/2/2019	2.69	7/1/2039	7/2/2019	116.89354	104.8225451	94.35153374	85.24707492	77.31177165	70.37846778	64.3054161	58.9722452	54.27658899

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190702A00068	7/2/2019	2.69	7/1/2039	7/2/2019	116.89355	104.8225459	94.35152786	85.24706352	77.3117557	70.37844809	64.30539337	58.97222	54.27656181
151209A00024	12/9/2015	2.22	12/9/2025	12/9/2015	102.35231	100.7255402	99.14119463	97.59782623	96.09404537	94.62852022	93.19997396	91.80718206	90.44896977
160603A00014	6/3/2016	1.74	6/3/2026	6/3/2016	101.86687	100.0029203	98.19324978	96.43583673	94.72874909	93.07014068	91.45824674	89.89137975	88.36792546
160608A00025	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.0044418	98.84203195	95.7997824	92.87242162	90.05494111	87.34258058	84.73081404	82.21533689
160908A00031	9/8/2016	2.21	9/8/2026	9/8/2016	105.21836	101.7292237	98.38108893	95.16747455	92.08223346	89.11953189	86.27383184	83.53987452	80.91266481
191105A00012	11/5/2019	2.07	11/3/2034	11/5/2019	107.6137	101.4622317	95.80393698	90.5928088	85.7875713	81.35115489	77.25023487	73.45482378	69.93791085
120330A00013	3/30/2012	2.98	4/2/2024	3/30/2012	102.61424	101.2906432	99.99148579	98.71614674	97.46402165	96.23452625	95.02709554	93.84118298	92.67625978
140730A00035	7/30/2014	2.67	1/30/2023	7/30/2014	100.42214	100.2535636	100.0856407	99.91837187	99.75175281	99.5857794	99.42044753	99.25575315	99.09169221
190813A00067	8/13/2019	1.9	8/13/2024	8/13/2019	101.60471	99.89322838	98.21911934	96.58128509	94.97866684	93.41024604	91.87504244	90.3721123	88.90054665
191015A00025	10/15/2019	2.01	10/15/2029	10/15/2019	104.54258	100.9865639	97.60702527	94.39347619	91.33613595	88.42587645	85.65417413	83.0130658	80.495108
220310A00009	3/10/2022	2.31	3/10/2027	3/10/2022	106.61196	102.5885666	98.74666167	95.07705896	91.57108807	88.22055975	85.01773667	81.95530626	79.02635518
150410A00021	4/10/2015	2.27	4/10/2025	4/10/2015	101.71139	100.424798	99.16664879	97.93608106	96.7322637	95.55439755	94.40171388	93.27347296	92.16896272
150803A00041	8/3/2015	3.01	8/2/2030	8/3/2015	109.14484	105.0123531	101.1058825	97.41073389	93.91328729	90.60091063	87.461881	84.48531292	81.66109262
190308A00026	3/8/2019	3.18	3/8/2034	3/8/2019	118.94366	109.7264071	101.4032957	93.87881895	87.06832087	80.89670228	75.29728825	70.21083524	65.5846603
170406A00026	4/6/2017	2.61	4/8/2024	4/6/2017	102.22115	100.8357596	99.47632654	98.14218208	96.83267969	95.54719451	94.28512236	93.04587895	91.82889904
170615A00006	6/15/2017	2.15	6/17/2024	6/15/2017	100.96844	100.1376915	99.32161967	98.51981868	97.73190191	96.95749716	96.19624591	95.4478027	94.71183448
181214A00030	12/14/2018	3.47	12/14/2033	12/14/2018	122.31075	112.5344146	103.7145101	95.74903561	88.5475202	82.02965428	76.12409306	70.76740678	65.90315915
190708A00028	7/8/2019	2.57	7/2/2029	7/8/2019	110.88313	104.8469233	99.20076574	93.91700821	88.97011362	84.33648506	79.99430808	75.92340658	72.10511117
200130A00046	1/30/2020	1.81	1/29/2027	1/30/2020	102.13849	99.98705465	97.90594942	95.89229216	93.94333701	92.05647026	90.22920303	88.45916441	86.74409507
160801A00002	8/1/2016	1.58	8/3/2026	8/1/2016	101.65829	99.71672509	97.83368293	96.00691387	94.23427609	92.51372543	90.84331025	89.22116653	87.64551332
170406A00034	4/6/2017	3.01	4/6/2027	4/6/2017	109.46167	105.3888742	101.5006366	97.7875225	94.24063467	90.85157588	87.61241795	84.51567315	81.55426733
210412A00008	4/12/2021	0.66	4/12/2024	4/12/2021	99.47188	98.09665729	96.74742032	95.42349534	94.12423123	92.8489988	91.59718978	90.36821604	89.16150873
140924A00057	9/24/2014	3.25	9/25/2028	9/24/2014	114.19247	108.7709538	103.6615928	98.8444704	94.30104659	90.0140572	85.96741981	82.14614681	78.53626534
170511A00011	5/11/2017	2.41	5/11/2027	5/11/2017	104.1138	101.7511936	99.47080167	97.26906518	95.14260875	93.08822662	91.10287295	89.18365273	87.32781333
191224A00002	12/24/2019	2.17	12/24/2029	12/24/2019	105.24089	101.5794497	98.10347246	94.8017255	91.66374693	88.67978529	85.84074641	83.13814454	80.56405747
151030A00026	10/30/2015	3.29	10/30/2030	10/30/2015	115.6419	108.9596317	102.7615505	97.00879205	91.66584454	86.70024347	82.08229391	77.78481927	73.78293423
160908A00026	9/8/2016	2.21	9/8/2026	9/8/2016	105.21836	101.7292238	98.38108891	95.1674745	92.08223336	89.11953176	86.27383168	83.53987432	80.91266457
180410A00002	4/10/2018	3.14	4/11/2033	4/10/2018	113.08529	107.4165481	102.1494594	97.25072187	92.69008986	88.44007376	84.47566818	80.77410889	77.31465514
161012A00011	10/12/2016	1.53	10/12/2023	10/12/2016	100.47573	99.75238788	99.04036324	98.33937623	97.64915415	96.9694336	96.29996013	95.64048779	94.99077883
170619A00092	6/16/2017	2.79	6/16/2027	6/16/2017	108.95138	104.7381714	100.7227746	96.89471671	93.24413664	89.76174903	86.4388071	83.26706831	80.23876242
180628A00068	6/28/2018	3.12	6/28/2028	6/28/2018	111.07676	106.6607176	102.4753901	98.50699653	94.74266414	91.1703652	87.77885661	84.557624	81.49683024
190718A00012	7/18/2019	2.55	7/18/2029	7/18/2019	109.90378	104.3501263	99.1455906	94.26574043	89.6879992	85.39149488	81.3569217	77.56641378	74.0034298
210714A00018	7/14/2021	0.75	7/12/2024	7/14/2021	99.591076	98.0042118	96.45063822	94.92936482	93.43944065	91.97995228	90.55002193	89.14880573	87.77549203

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170105A00010	1/5/2017	2.61	1/5/2027	1/5/2017	103.91405	101.7266352	99.61066541	97.56320927	95.5814809	93.66282835	91.80472611	90.00476823	88.26066179
200306A00058	3/6/2020	1.06	3/6/2030	3/6/2020	101.13902	97.50301323	94.05669083	90.78825149	87.68672185	84.7418924	81.944259	79.28496935	76.75577372
160608A00033	6/8/2016	2.44	6/9/2031	6/8/2016	107.3355	102.8611197	98.65403806	94.69538875	90.96778982	87.45522047	84.14290479	81.01720621	78.0655315
161202A00001	12/2/2016	2.65	12/1/2023	12/2/2016	101.70282	100.6389919	99.59758195	98.57788361	97.57922147	96.60094786	95.64244149	94.70310613	93.78236932
170207A00055	2/7/2017	2.36	2/8/2027	2/7/2017	103.73148	101.5015661	99.34577429	97.26101695	95.24436118	93.29301706	91.40432951	89.57577089	87.80493395
200317A00009	3/17/2020	1.61	3/16/2035	3/17/2020	103.86338	97.79903089	92.2313184	87.11294588	82.40157303	78.05926127	74.05198154	70.34918054	66.92339795
150925A00034	9/25/2015	2.36	9/25/2025	9/25/2015	102.16667	100.6676382	99.20543086	97.77883952	96.38670916	95.02793138	93.70144208	92.40621935	91.14128142
161004A00070	10/4/2016	1.92	10/4/2023	10/4/2016	100.78781	99.87997065	98.98856411	98.11315039	97.25330105	96.40860286	95.5786571	94.76307897	93.96149695
140618A00019	6/18/2014	3.08	6/18/2024	6/18/2014	101.84035	100.962928	100.1012346	99.25484019	98.42332782	97.60629626	96.80335905	96.01414382	95.23829163
191122A00003	11/22/2019	2.32	11/22/2039	11/22/2019	111.41582	100.8608986	91.64618143	83.58071072	76.50264684	70.27461231	64.77980672	59.91876299	55.60663569
171207A00024	12/7/2017	2.93	12/7/2027	12/7/2017	110.7345	105.9672431	101.4450107	97.15376895	93.08036242	89.21245741	85.53848616	82.04759512	78.72959692
180104A00023	1/4/2018	2.91	1/4/2028	1/4/2018	109.15408	105.0110641	101.0717716	97.3247498	93.75926179	90.36523639	87.13322306	84.05434996	81.120285
200206A00034	2/6/2020	1.84	2/6/2025	2/6/2020	102.04215	99.88658769	97.78790543	95.74420316	93.75366056	91.8145324	89.92514474	88.08389138	86.28923051
200327A00094	3/27/2020	1.6	3/27/2030	3/27/2020	104.63815	98.87362369	93.50344396	88.49776749	83.82917779	79.47247931	75.4045059	71.60394682	68.05118848
150929A00083	9/29/2015	2.09	9/29/2025	9/29/2015	101.95024	100.451247	98.98914337	97.56272511	96.17083271	94.81235353	93.48621952	92.19140504	90.92692486
160608A00030	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.0044418	98.84203193	95.7997823	92.87242144	90.05494087	87.34258026	84.73081367	82.21533646
180628A00078	6/28/2018	2.73	6/28/2023	6/28/2018	100.79591	100.4192341	100.0460681	99.67635755	99.31004922	98.94709089	98.58743148	98.23102103	97.87781062
181128A00011	11/28/2018	3.27	11/28/2023	11/28/2018	102.34885	101.290904	100.2550531	99.2406065	98.2469034	97.27331023	96.31921896	95.3840459	94.46723047
151228A00013	12/28/2015	2.27	12/29/2025	12/28/2015	102.43833	100.8087745	99.22176818	97.67585704	96.16964519	94.70179503	93.27102433	91.87610344	90.51585279
160908A00036	9/8/2016	2.3	9/8/2031	9/8/2016	106.83128	102.2562602	97.96142914	93.92654356	90.13298915	86.56364141	83.20273572	80.03574968	77.04929631
201207A00009	12/7/2020	1.01	12/7/2027	12/7/2020	101.6686	97.15879829	92.88329063	88.82858045	84.98202106	81.33175855	77.86667777	74.57635225	71.45099786
190605A00027	6/5/2019	2.64	6/5/2029	6/5/2019	111.23502	105.2426092	99.63371281	94.38139764	89.46076892	84.84880522	80.52420776	76.46726254	72.65971424
210611A00011	6/11/2021	1.02	6/11/2026	6/11/2021	100.86764	97.61362785	94.48550648	91.47767762	88.58482737	85.8019083	83.12412438	80.54691691	78.06595128
160810A00025	8/10/2016	2.17	8/10/2026	8/10/2016	104.9436	101.5251716	98.24246012	95.08927113	92.05972865	89.14825904	86.34957346	83.65865148	81.07072575
200109A00006	1/9/2020	1.95	1/9/2030	1/9/2020	104.99106	101.2869443	97.77271983	94.43675759	91.26823642	88.25707748	85.39388822	82.66991081	80.07697495
150722A00033	7/22/2015	2.47	7/22/2025	7/22/2015	102.19015	100.7731655	99.38958945	98.03835395	96.71843821	95.42886203	94.16868383	92.93699885	91.73293734
160810A00030	8/10/2016	2.24	8/11/2031	8/10/2016	106.50782	101.9869084	97.74061746	93.74925468	89.99470341	86.46028681	83.13064307	79.99161236	77.03013418
160908A00017	9/8/2016	1.87	9/8/2023	9/8/2016	100.70687	99.87026343	99.04765672	98.2387031	97.44306372	96.66041088	95.89042758	95.13280706	94.38725241
171109A00016	11/9/2017	2.94	11/9/2032	11/9/2017	116.37247	107.7769476	99.9561103	92.83389258	86.34216113	80.41984188	75.01215142	70.0699158	65.54896645
180215A00034	2/15/2018	2.9	2/15/2023	2/15/2018	100.70914	100.4137805	100.1201627	99.82827274	99.53809528	99.24961523	98.96281767	98.67768784	98.39421117
180517A00024	5/17/2018	3.46	5/17/2033	5/17/2018	115.01645	109.2081837	103.8143344	98.80030906	94.13471333	89.7890316	85.73734149	81.95605863	78.42370813
150803A00042	8/3/2015	3.01	8/2/2030	8/3/2015	109.14484	105.0123532	101.1058826	97.41073385	93.91328719	90.60091047	87.46188079	84.48531265	81.6610923
160428A00028	4/28/2016	2	4/28/2026	4/28/2016	102.23815	100.447741	98.70770736	97.01622526	95.37154809	93.77200519	92.215998	90.70199643	89.22853541

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170619A00101	6/16/2017	2.74	6/16/2027	6/16/2017	108.31429	104.2956294	100.4627223	96.80580974	93.3157058	89.983758	86.80181311	83.76218542	80.85762719
170406A00032	4/6/2017	3.01	4/6/2027	4/6/2017	109.46167	105.3888743	101.5006367	97.78752249	94.24063461	90.85157577	87.61241781	84.51567296	81.55426711
200414A00024	4/14/2020	1.37	4/14/2027	4/14/2020	102.94253	98.9093765	95.06290584	91.39344954	87.89189434	84.54964407	81.35858754	78.31106868	75.39985861
200623A00028	6/23/2020	1.23	6/23/2038	6/23/2020	101.82908	94.47476964	87.85747828	81.89196471	76.50376844	71.62775195	67.20685339	63.19101511	59.53626218
160608A00020	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.0044417	98.84203196	95.7997825	92.87242182	90.05494139	87.34258094	84.73081448	82.2153374
161014A00029	10/14/2016	2.51	10/15/2031	10/14/2016	108.54836	103.8427422	99.42838185	95.28402402	91.39014488	87.72879762	84.28347379	81.03897766	77.98131244
200330A00079	3/30/2020	1.51	3/30/2035	3/30/2020	103.2293	97.20161975	91.6676157	86.58026467	81.89747539	77.58153296	73.59860942	69.91833238	66.5134045
180420A00011	4/20/2018	2.74	4/20/2023	4/20/2018	100.65738	100.3681986	100.0810386	99.79587421	99.51268265	99.23144131	98.95212797	98.6747208	98.39919829
180605A00031	6/5/2018	3.37	6/5/2030	6/5/2018	110.45397	106.356875	102.479723	98.8084579	95.33003753	92.03235037	88.90414258	85.93495137	83.11504388
181128A00004	11/28/2018	3.08	11/28/2023	11/28/2018	102.26154	101.2027783	100.1661545	99.15097715	98.1565837	97.18233856	96.2276319	95.29187832	94.37451562
190104A00038	1/4/2019	3.25	1/4/2029	1/4/2019	113.8671	108.260389	102.9884055	98.02899736	93.36160912	88.9671537	84.8278997	80.92736759	77.25023451
200309A00083	3/9/2020	0.82	3/9/2023	3/9/2020	100.07829	99.72430007	99.372827	99.02383949	98.67731115	98.33321596	97.99152827	97.65222279	97.31527459
130614A00018	6/14/2013	2.83	6/14/2023	6/14/2013	100.7932	100.4216674	100.053521	99.68870597	99.32717256	98.96887184	98.61375595	98.26177804	97.9128922
150803A00037	8/3/2015	3.41	8/2/2030	8/3/2015	116.2015	109.648596	103.5583649	97.89456975	92.62403334	87.71636388	83.14370552	78.88051255	74.90334495
180809A00034	8/9/2018	3.08	8/9/2023	8/9/2018	101.60482	100.8390618	100.0849285	99.3421558	98.61048772	97.88967579	97.17947896	96.47966329	95.79000167
201203A00007	12/3/2020	0.58	12/1/2023	12/3/2020	99.476	98.43069566	97.40745551	96.40558483	95.42441826	94.46331778	93.52167141	92.59889181	91.6944151
170526A00017	5/26/2017	2.16	5/28/2024	5/26/2017	100.93023	100.1406258	99.36474848	98.60222668	97.85269976	97.11582053	96.39125461	95.6786798	94.97778553
190905A00019	9/5/2019	2.08	9/5/2029	9/5/2019	107.97543	101.9320706	96.28891036	91.0169945	86.08961685	81.48213167	77.1717846	73.13755828	69.36003134
181218A00086	12/18/2018	3.06	10/18/2023	12/18/2018	101.88503	100.9533208	100.0390085	99.14160255	98.26063389	97.39565083	96.54621814	95.71191629	94.89234078
190403A00013	4/3/2019	3.05	4/3/2029	4/3/2019	113.08638	107.3212389	101.9122986	96.83526179	92.06762374	87.58852787	83.37863673	79.4200136	75.69601396
220407A00017	4/7/2022	3.16	4/6/2029	4/7/2022	113.19787	107.6301991	102.401671	97.48932773	92.87189067	88.52963303	84.4442586	80.59879052	76.97746937
160907A00041	9/7/2016	1.83	9/7/2023	9/7/2016	100.67344	99.83603777	99.01263584	98.20287994	97.40643218	96.62296578	95.85216457	95.0937226	94.34734371
180809A00032	8/9/2018	3.08	8/9/2023	8/9/2018	101.60482	100.8390618	100.0849285	99.3421558	98.61048771	97.88967578	97.17947895	96.47966328	95.79000165
151223A00078	12/23/2015	2.28	12/23/2025	12/23/2015	102.4541	100.8247154	99.23786585	97.69209252	96.18600084	94.7182544	93.28757208	91.8927253	90.53253545
200413A00013	4/13/2020	1.19	4/12/2030	4/13/2020	101.64279	97.94938244	94.45054995	91.13407335	87.98860088	85.00357763	82.16918414	79.47628007	76.91635252
150213A00014	2/13/2015	2.41	2/13/2025	2/13/2015	101.91841	100.7088982	99.52503967	98.36606826	97.23124875	96.11987418	95.03126446	93.96476519	92.91974636
200709A00018	7/9/2020	0.59	7/7/2023	7/9/2020	99.752063	99.07989133	98.41678982	97.76257569	97.11707091	96.48010218	95.85150078	95.23110241	94.61874705
201228A00013	12/28/2020	0.84	12/30/2030	12/28/2020	100.23947	96.28855025	92.56181265	89.04417666	85.72169689	82.58147204	79.61155939	76.80089685	74.13923183
160511A00015	5/11/2016	2.42	5/11/2026	5/11/2016	105.3488	102.1218138	99.01626154	96.02686998	93.14862544	90.37675969	87.70673642	85.1342386	82.65515657
161207A00014	12/7/2016	2.75	12/8/2031	12/7/2016	109.84178	104.996988	100.4569015	96.19894746	92.20241721	88.44829863	84.91912497	81.59883803	78.47266449
200512A00017	5/12/2020	0.85	5/12/2025	5/12/2020	99.900993	97.60958442	95.38430055	93.22283295	91.12296911	89.08258759	87.09965368	85.17221522	83.29839868
150722A00035	7/22/2015	2.92	7/22/2025	7/22/2015	105.08173	102.6091554	100.2109163	97.88427517	95.6266129	93.43542604	91.30832079	89.24300724	87.23729403
150814A00029	8/14/2015	2.39	8/14/2025	8/14/2015	102.14187	100.6851482	99.26344895	97.87564593	96.52065423	95.19743246	93.90498071	92.64233848	91.40858285

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160413A00016	4/13/2016	2.55	4/14/2031	4/13/2016	107.72379	103.3150786	99.16533223	95.25655263	91.57214428	88.09679199	84.81635313	81.71775959	78.78892852
200306A00048	3/6/2020	1.04	3/6/2035	3/6/2020	101.13475	95.20431216	89.76089998	84.75802567	80.15408586	75.91181074	71.99777865	68.38198826	65.0374813
200306A00050	3/6/2020	0.87	3/6/2030	3/6/2020	100.94162	97.30153924	93.85178246	90.58048505	87.47661639	84.52991516	81.73083036	79.0704672	76.54053751
190205A00019	2/5/2019	2.94	2/5/2024	2/5/2019	102.36476	101.1307406	99.92502584	98.74664055	97.59465333	96.46817499	95.3663561	94.28838485	93.23348492
210412A00007	4/12/2021	0.66	4/12/2024	4/12/2021	99.47188	98.09665728	96.74742031	95.42349532	94.12423121	92.84899876	91.59718974	90.368216	89.16150868
190708A00025	7/8/2019	2.21	7/1/2024	7/8/2019	101.99138	100.3813458	98.8046953	97.26045357	95.74768025	94.26547138	92.81295767	91.38930283	89.99370195
191031A00025	10/31/2019	1.91	10/31/2024	10/31/2019	100.96894	99.93411651	98.91944585	97.92435361	96.94829062	95.99072809	95.05115674	94.12908583	93.22404235
200206A00033	2/6/2020	2.15	2/6/2030	2/6/2020	108.609	102.2211477	96.27812995	90.74612206	85.59405781	80.79339012	76.31787358	72.1433668	68.24765281
190104A00006	1/4/2019	2.83	1/5/2026	1/4/2019	103.24415	101.5653307	99.93104778	98.33975632	96.7899787	95.2802995	93.80936237	92.37586716	90.9785671
190501A00015	5/1/2019	2.78	5/1/2029	5/1/2019	106.95427	103.5247306	100.2565929	97.140722	94.16857123	91.33213925	88.62393152	86.03692474	83.56453405
170921A00057	9/21/2017	2.79	9/21/2027	9/21/2017	108.93718	104.7058445	100.6792043	96.84609238	93.19601225	89.71909427	86.40605466	83.24815771	80.23718059
200311A00026	3/11/2020	1.34	3/11/2030	3/11/2020	103.24601	97.24881879	91.67003916	86.47772693	81.64254583	77.13754539	72.93795495	69.02099662	65.36571504
151118A00037	11/18/2015	2.75	11/18/2025	11/18/2015	104.79899	102.2813951	99.84466582	97.48567921	95.20145675	92.98915315	90.84604949	88.76954678	86.75715983
150812A00052	8/14/2015	2.13	8/14/2025	8/14/2015	101.94597	100.4893072	99.06773396	97.68011115	96.3253504	95.00240712	93.71027837	92.44800086	91.21464901
190404A00015	4/4/2019	2.88	4/3/2026	4/4/2019	106.84073	103.5758796	100.431714	97.40311362	94.48520282	91.67333808	88.96309586	86.35026088	83.83081523
210714A00015	7/14/2021	1.11	7/14/2026	7/14/2021	101.20639	97.94172403	94.80492016	91.79019365	88.89206141	86.10532127	83.42503568	80.84651648	78.3653106
161222A00013	12/22/2016	2.93	12/22/2026	12/22/2016	108.57758	104.9063284	101.3901932	98.021649	94.79358478	91.69927505	88.73235656	85.88680657	83.15692254
170406A00029	4/6/2017	3.01	4/6/2027	4/6/2017	109.46167	105.3888753	101.500637	97.78752223	94.24063377	90.85157438	87.61241589	84.51567056	81.55426425
190930A00026	9/30/2019	1.95	9/30/2024	9/30/2019	101.82205	100.0248426	98.2691765	96.55384036	94.87766397	93.23951889	91.63831661	90.07300685	88.54257603
150603A00012	6/3/2015	2.77	6/3/2030	6/3/2015	108.56725	104.5273604	100.7048364	97.08575928	93.65721624	90.4072174	87.32462359	84.39908004	81.62095571
190930A00028	9/30/2019	1.95	9/30/2024	9/30/2019	101.82205	100.0248426	98.26917667	96.55384069	94.87766446	93.23951953	91.63831739	90.07300778	88.54257709
210107A00010	1/7/2021	0.54	1/5/2024	1/7/2021	99.397973	98.26532522	97.15862198	96.07697788	95.01954716	93.98552176	92.97412926	91.98463092	91.01631991
160421A00016	4/21/2016	2.26	4/21/2026	4/21/2016	104.93897	101.873062	98.91988751	96.07463669	93.33273181	90.68981565	88.14173958	85.68455236	83.31448961
160810A00028	8/10/2016	2.19	8/10/2026	8/10/2016	105.14001	101.6424619	98.2847596	95.06049531	91.9635936	88.98829229	86.12912424	83.38090038	80.73869383
190402A00005	4/2/2019	2.77	4/2/2032	4/2/2019	111.66508	105.5591013	99.90598452	94.66715273	89.80761903	85.29562951	81.10234343	77.20154687	73.56939616
160608A00027	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.0044418	98.84203194	95.79978236	92.87242155	90.05494101	87.34258045	84.73081389	82.21533671
160908A00037	9/8/2016	1.4	9/8/2023	9/8/2016	100.34554	99.72473239	99.11296098	98.51002117	97.91571043	97.32983259	96.75219754	96.18262102	95.6209244
181003A00032	10/3/2018	3.23	10/3/2025	10/3/2018	103.60648	102.0465828	100.525716	99.04258537	97.59595187	96.18462683	94.80746939	93.46338428	92.15131958
190829A00032	8/29/2019	1.69	8/28/2026	8/29/2019	101.88018	99.93294406	98.04447156	96.21250305	94.43488671	92.70956873	91.03458816	89.408072	87.82823067
160616A00029	6/16/2016	1.58	6/16/2026	6/16/2016	101.56269	99.70347324	97.89843127	96.14554595	94.44288737	92.78861152	91.18095576	89.61823472	88.09883623
180517A00018	5/17/2018	3.46	5/17/2033	5/17/2018	115.01645	109.2081853	103.8143347	98.80030826	94.13471154	89.78902893	85.73733807	81.95605454	78.42370346
191004A00017	10/4/2019	2.02	10/4/2029	10/4/2019	107.63662	101.5483858	95.86757813	90.56441102	85.61143497	80.98334046	76.6567805	72.61020877	68.82373187
191101A00005	11/1/2019	1.83	11/2/2026	11/1/2019	104.72023	100.9992176	97.43581671	94.02247478	90.75204224	87.61774933	84.61318376	81.73226983	78.96924897

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200610A00006	6/10/2020	1.11	6/10/2027	6/10/2020	101.92135	97.79434844	93.86395375	90.11968728	86.55169055	83.15068186	79.90791919	76.81516583	73.8646583
150203A00027	2/3/2015	2.26	2/4/2030	2/3/2015	106.23839	102.4493444	98.85645746	95.44760674	92.21151913	89.13770147	86.2163811	83.43845138	80.7954217
160906A00027	9/6/2016	2.03	9/8/2031	9/6/2016	106.22274	101.6581571	97.373803	93.34938384	89.56624787	86.00723897	82.656566	79.49968451	76.52318932
190315A00029	3/15/2019	2.88	3/15/2034	3/15/2019	112.32469	106.2350677	100.609882	95.40782838	90.59165636	86.12774308	81.98571238	78.13809628	74.56003415
220407A00014	4/7/2022	3.14	4/6/2029	4/7/2022	112.22368	107.0312892	102.1466811	97.54933707	93.22022991	89.14170608	85.29737903	81.67203139	78.25152535
180615A00021	6/15/2018	3.02	6/15/2023	6/15/2018	101.30107	100.6890843	100.0845898	99.48745113	98.89753374	98.31470654	97.73884157	97.16981395	96.60750175
190104A00035	1/4/2019	3.1	1/5/2026	1/4/2019	106.84166	103.8342288	100.9306281	98.12663579	95.41822674	92.80156506	90.27299403	87.82902646	85.46633558
170602A00019	6/2/2017	2.42	6/3/2024	6/2/2017	102.18201	100.6457202	99.14031521	97.66492842	96.21872292	94.80089268	93.41066109	92.04727963	90.7100266
190305A00015	3/5/2019	3.32	3/5/2029	3/5/2019	114.54002	108.7752864	103.3625859	98.27817592	93.50004546	89.00777754	84.78242587	80.80640156	77.06336911
210913A00015	9/13/2021	1.08	9/14/2026	9/13/2021	101.15353	97.89202532	94.7613391	91.75547282	88.86873333	86.09571799	83.43129822	80.87060417	78.40901031
150803A00036	8/3/2015	3.41	8/2/2030	8/3/2015	116.2015	109.648596	103.5583649	97.89456976	92.62403336	87.71636391	83.14370556	78.8805126	74.90334501
160210A00049	2/10/2016	1.78	2/10/2026	2/10/2016	101.72632	100.0275819	98.37485468	96.76651902	95.20102298	93.67688096	92.19267026	90.74702796	89.33864795
140917A00030	9/17/2014	3.23	9/17/2029	9/17/2014	114.36022	108.6592194	103.3187743	98.31340171	93.61956642	89.21552589	85.08118406	81.19795791	77.54865552
160711A00004	7/11/2016	1.51	7/13/2026	7/11/2016	101.47393	99.5759059	97.7341479	95.94652513	94.21100561	92.52564891	90.88860135	89.29809147	87.75242577
200608A00001	6/8/2020	1.34	6/7/2030	6/8/2020	103.04286	97.22841205	91.82095724	86.78898725	82.10362322	77.7383788	73.66894896	69.87301864	66.33008914
210423A00001	4/23/2021	1.72	4/23/2036	4/23/2021	105.57789	98.89057101	92.79428778	87.22849275	82.13945076	77.4794151	73.2059116	69.28111331	65.67129366
160427A00004	4/27/2016	2.09	4/27/2026	4/27/2016	102.16756	100.382041	98.64666859	96.95963092	95.31919208	93.72369156	92.17154038	90.6612175	89.19126637
180309A00011	3/9/2018	3.19	3/10/2025	3/9/2018	105.25125	102.9684849	100.7478885	98.58741776	96.4851128	94.439089	92.44753374	90.50870317	88.62091919
200110A00053	1/10/2020	1.99	1/10/2025	1/10/2020	102.28352	100.1912279	98.15269193	96.1661402	94.22987645	92.34227403	90.50177236	88.70687365	86.95613978
221014A00032	10/14/2022	4.67	10/14/2027	10/14/2022	117.35926	112.8099945	108.4821269	104.3634742	100.4425931	96.70873033	93.15177716	89.76222752	86.53113874
160908A00033	9/8/2016	2.17	9/8/2026	9/8/2016	104.84964	101.5027852	98.28936694	95.20329633	92.23879314	89.39037076	86.65281972	84.02119217	81.4907874
210319A00009	3/19/2021	1.1	3/19/2026	3/19/2021	100.96393	97.8961356	94.94072538	92.09297861	89.34839757	86.70269654	84.15179062	81.69178526	79.31896632
201207A00021	12/7/2020	1.85	12/7/2050	12/7/2020	104.67278	92.06828531	81.55589859	72.73831669	65.2998507	58.98873473	53.60342947	48.98198702	44.99376921
200227A00046	2/27/2020	1.52	3/1/2027	2/27/2020	101.52076	99.34220004	97.23597366	95.19907683	93.22865056	91.32197487	89.47646098	87.6896441	85.9591766
200806A00004	8/6/2020	0.3	3/6/2024	8/6/2020	99.574913	98.83878655	98.11522649	97.40388993	96.70444667	96.01657891	95.33998068	94.67435723	94.01942455
140318A00003	3/17/2014	3.08	3/18/2024	3/17/2014	102.9485	101.6021208	100.2801208	98.98189503	97.70685526	96.4544322	95.22407484	94.0152497	92.82744017
170829A00066	8/29/2017	2.11	8/29/2024	8/29/2017	102.25939	100.5013495	98.78250836	97.10176039	95.45803433	93.85029613	92.27754735	90.73882371	89.23319365
190911A00016	9/11/2019	1.9	9/11/2029	9/11/2019	104.60022	101.0725194	97.71846033	94.52780041	91.49098476	88.59909163	85.84378609	83.21727735	80.7122796
180126A00011	1/26/2018	2.72	1/26/2028	1/26/2018	105.68932	102.9548227	100.3268113	97.80020595	95.37020378	93.03226502	90.78209693	88.61563863	86.529047
200512A00014	5/12/2020	1.17	5/12/2027	5/12/2020	102.12325	98.05386295	94.17569746	90.47870351	86.95341367	83.59090626	80.38277085	77.32107625	74.39834058
210915A00023	9/15/2021	0.74	9/16/2024	9/15/2021	99.590272	97.82856342	96.10704452	94.42456043	92.77999722	91.1722799	89.60037081	88.06326806	86.5600041
151204A00011	12/4/2015	2.28	12/4/2025	12/4/2015	102.45131	100.8233296	99.23779098	97.69324829	96.18831172	94.72164933	93.29198414	91.89809145	90.53879632
200709A00019	7/9/2020	0.77	7/9/2025	7/9/2020	99.727853	97.23986917	94.82748035	92.48790247	90.21847455	88.01665237	85.8800023	83.80619568	81.7930034

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150824A00033	8/24/2015	2.22	8/25/2025	8/24/2015	101.89042	100.4364037	99.01737731	97.63221492	96.27983273	94.95919038	93.66928888	92.40916855	91.17790721
210512A00009	5/12/2021	0.66	5/10/2024	5/12/2021	99.440503	97.99620751	96.58032778	95.19209167	93.83075479	92.49559911	91.1859317	89.90108371	88.64040929
161014A00019	10/14/2016	2.39	10/15/2031	10/14/2016	107.30228	102.6663833	98.31674748	94.23252391	90.39455972	86.78524613	83.38838297	80.18905585	77.17352491
190708A00030	7/8/2019	2.57	7/2/2029	7/8/2019	110.88313	104.8469239	99.20076566	93.91700755	88.97011242	84.33648336	79.9943059	75.92340397	72.10510815
190510A00049	5/10/2019	2.58	5/8/2026	5/10/2019	103.06703	101.2656496	99.51486901	97.81286054	96.15787216	94.54822799	92.98232434	91.45862609	89.97566327
200424A00022	4/24/2020	1.39	4/24/2030	4/24/2020	103.36933	97.61696243	92.2619516	87.27393446	82.62504222	78.28968544	74.24435565	70.46744511	66.93908311
160608A00021	6/8/2016	1.91	6/8/2023	6/8/2016	100.61308	100.0159445	99.42593623	98.84292511	98.26678688	97.69740022	97.13464664	96.57841041	96.02857848
190605A00025	6/5/2019	2.64	6/5/2029	6/5/2019	111.23502	105.2426076	99.63371293	94.38139937	89.46077211	84.84880976	80.52421353	76.46726943	72.65972216
180125A00027	1/25/2018	2.69	1/24/2025	1/25/2018	102.28681	100.9798082	99.70151581	98.4510577	97.22759242	96.0303115	94.85843788	93.71122436	92.58795219
210714A00010	7/14/2021	0.75	7/12/2024	7/14/2021	99.587251	97.98551322	96.41743194	94.8820046	93.37826916	91.90530158	90.4622139	89.04815246	87.66229622
190118A00006	1/18/2019	3.14	1/18/2034	1/18/2019	113.78333	107.6989348	102.072619	96.86413714	92.03715249	87.55882597	83.39945282	79.53213952	75.93251605
160504A00022	5/4/2016	2	5/4/2023	5/4/2016	100.60876	100.1029201	99.60217387	99.10644826	98.61566794	98.12975908	97.6486493	97.17226768	96.70054467
190813A00051	8/13/2019	2.19	8/13/2029	8/13/2019	108.62347	102.5995305	96.97111208	91.70978624	86.78932069	82.18550002	77.87596003	73.84003668	70.05862801
191004A00026	10/4/2019	1.74	10/4/2024	10/4/2019	101.47788	99.63834338	97.84175631	96.08685281	94.37241574	92.69727159	91.06028862	89.46037503	87.89647732
210107A00009	1/7/2021	0.54	1/5/2024	1/7/2021	99.397973	98.26532519	97.15862193	96.07697782	95.01954708	93.98552167	92.97412915	91.9846308	91.01631978
170406A00036	4/6/2017	3.07	4/6/2032	4/6/2017	111.0194	105.9725142	101.2523231	96.83395759	92.69465168	88.81355304	85.17154838	81.75110576	78.53613228
200406A00030	4/6/2020	1.61	4/5/2030	4/6/2020	105.0887	98.74987496	92.86227657	87.39093817	82.30379173	77.57140946	73.16677338	69.06506616	65.24348108
200406A00036	4/6/2020	1.09	4/4/2025	4/6/2020	100.45151	98.18014321	95.97246596	93.82633237	91.73968234	89.71053711	87.7369955	85.81723045	83.94948558
140428A00015	4/28/2014	2.35	4/29/2024	4/28/2014	101.1856	100.3929034	99.61400427	98.84853022	98.09611839	97.35641941	96.62909677	95.91382629	95.21029547
160413A00033	4/13/2016	2.32	4/13/2026	4/13/2016	104.25522	101.4742345	98.79166108	96.20339521	93.7055283	91.29433699	88.96627325	86.71795509	84.54615778
171207A00022	12/7/2017	2.45	12/7/2022	12/7/2017	100.24585	100.1432993	100.0409686	99.93885692	99.83696369	99.73528816	99.6338296	99.53258731	99.43156057
200206A00032	2/6/2020	2.15	2/6/2030	2/6/2020	108.609	102.2211485	96.27812834	90.74611835	85.59405219	80.79338279	76.3178647	72.14335653	68.2476413
210714A00014	7/14/2021	1.12	7/14/2026	7/14/2021	101.28072	97.94231152	94.73559228	91.65458181	88.69361316	85.84731037	83.11057158	80.47855319	77.94665505
161227A00073	12/27/2016	2.83	12/28/2026	12/27/2016	107.41488	104.0823046	100.8860041	97.81948025	94.87658344	92.05149466	89.33870544	86.73299932	84.2294345
190926A00002	9/30/2019	2.01	9/29/2034	9/30/2019	107.18541	101.136454	95.56663724	90.43177109	85.69216348	81.31212333	77.25952617	73.50542992	70.02373462
200110A00038	1/10/2020	2.32	1/10/2030	1/10/2020	109.6853	103.3032001	97.36130042	91.82641728	86.66805219	81.85816052	77.37094108	73.18264485	69.27140103
200116A00012	1/16/2020	2.16	1/19/2027	1/16/2020	105.85862	101.9370607	98.1880499	94.60298814	91.1737523	87.89267052	84.75249428	81.74637227	78.86782623
200406A00033	4/6/2020	1.09	4/4/2025	4/6/2020	100.45151	98.18014322	95.97246597	93.82633239	91.73968237	89.71053714	87.73699554	85.81723048	83.94948562
171219A00067	12/19/2017	2.72	12/20/2027	12/19/2017	109.65129	105.2029746	100.9790591	96.9667693	93.15413724	89.52994192	86.08365811	82.80540929	79.68592391
180913A00062	9/13/2018	3.05	9/13/2023	9/13/2018	101.72835	100.8757764	100.0376577	99.21363088	98.40334114	97.60644554	96.82261253	96.05152143	95.29286201
190322A00008	3/22/2019	2.64	3/20/2026	3/22/2019	103.09023	101.3303464	99.61896761	97.95436371	96.3348799	94.75893244	93.22500506	91.73164555	90.27746257
150615A00024	6/15/2015	2.26	6/16/2025	6/15/2015	102.00298	100.6275386	99.28390489	97.9710781	96.68809996	95.4340499	94.20804321	93.00922932	91.83679022
160209A00008	2/9/2016	2.45	2/10/2031	2/9/2016	107.1629	102.8588388	98.80324893	94.97914371	91.37083545	87.96382886	84.74472194	81.70111581	78.82153255

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190315A00019	3/15/2019	2.88	3/15/2034	3/15/2019	112.32469	106.2350645	100.6098817	95.40783073	90.59166115	86.12775013	81.9857215	78.13810732	74.56004696
191011A00027	10/11/2019	1.84	10/11/2029	10/11/2019	104.43163	100.8689381	97.48343059	94.26456088	91.20249176	88.28804357	85.5126457	82.868292	80.34749972
200616A00005	6/16/2020	0.74	6/17/2030	6/16/2020	100.43823	96.69928392	93.16157354	89.81221503	86.63924954	83.63157338	80.77887097	78.07155338	75.5007021
210611A00009	6/11/2021	0.61	6/11/2024	6/11/2021	99.371901	97.84925456	96.35751758	94.89580893	93.4632812	92.05911872	90.68253603	89.33277653	88.00911109
140717A00027	7/17/2014	3.14	7/17/2026	7/17/2014	107.64458	104.4176481	101.3140016	98.3281298	95.45480672	92.68907251	90.02621788	87.46176976	84.99147786
200512A00011	5/12/2020	1.48	5/10/2030	5/12/2020	104.21306	97.84885663	91.94305471	86.45972121	81.36593237	76.63150682	72.22876346	68.13230176	64.3188025
200428A00009	4/28/2020	1.08	4/29/2030	4/28/2020	101.22002	97.54144217	94.05670564	90.75363362	87.6209136	84.64802757	81.82519065	79.14329496	76.59385811
160303A00035	3/3/2016	2.14	3/3/2026	3/3/2016	102.24677	100.4617673	98.72657768	97.03941576	95.39856932	93.80239982	92.24933871	90.73788393	89.26659662
160810A00027	8/10/2016	2.13	8/10/2026	8/10/2016	104.59238	101.311532	98.1592287	95.12964288	92.21724528	89.41678988	86.72329764	84.13204113	81.63853023
180206A00045	2/6/2018	2.71	2/6/2023	2/6/2018	100.61126	100.3410263	100.0722471	99.80491456	99.53901696	99.27454275	99.01148048	98.74981884	98.48954663
181105A00015	11/5/2018	3.57	11/5/2025	11/5/2018	107.91573	104.9939811	102.1695012	99.43849382	96.79733253	94.24255335	91.77084624	89.3790474	87.06413184
151118A00025	11/18/2015	2.4	11/18/2022	11/18/2015	100.1238	100.0738394	100.0239439	99.9741135	99.92434808	99.87464753	99.8250117	99.77544048	99.72593373
160119A00072	1/19/2016	2.77	1/21/2031	1/19/2016	108.58143	104.1069593	99.90058645	95.94334032	92.21774998	88.70771702	85.39839772	82.27609613	79.32816696
160908A00034	9/8/2016	2.17	9/8/2026	9/8/2016	104.84964	101.5027852	98.28936695	95.20329636	92.23879319	89.39037083	86.65281981	84.02119228	81.49078752
200212A00013	2/12/2020	1.98	2/12/2027	2/12/2020	105.24553	101.2841298	97.49952634	93.88282589	90.42563346	87.12002132	83.95850017	80.93399236	78.03980686
210319A00008	3/19/2021	0.63	3/19/2024	3/19/2021	99.456208	98.1405901	96.84881947	95.58030192	94.33446269	93.11074555	91.90861205	90.72754081	89.56702689
140908A00080	9/8/2014	2.51	3/8/2024	9/8/2014	101.94773	100.7511314	99.57573352	98.42100682	97.28644103	96.17154252	95.0758336	93.99885187	92.94014963
170524A00027	5/24/2017	2.32	5/24/2027	5/24/2017	103.89833	101.539944	99.26365767	97.06591736	94.9433506	92.89275451	90.9110861	88.99545317	87.14310582
160404A00019	4/4/2016	2.48	4/4/2031	4/4/2016	107.40856	103.012971	98.8755451	94.97834655	91.30483308	87.83973851	84.56896527	81.47948664	78.55925792
160608A00022	6/8/2016	1.91	6/8/2023	6/8/2016	100.61308	100.0159445	99.42593625	98.84292515	98.26678695	97.69740031	97.13464674	96.57841053	96.02857862
160908A00022	9/8/2016	2.21	9/8/2026	9/8/2016	105.21836	101.7292237	98.38108893	95.16747458	92.08223351	89.11953196	86.27383194	83.53987463	80.91266494
150427A00014	4/27/2015	2.98	4/27/2035	4/27/2015	112.85282	106.2245248	100.1421905	94.55353035	89.41176654	84.67501086	80.30571486	76.27018591	72.53816034
150803A00039	8/3/2015	3.01	8/2/2030	8/3/2015	109.14484	105.0123514	101.1058821	97.41073455	93.913289	90.60091332	87.4618846	84.48531737	81.66109786
190129A00073	1/29/2019	3.11	1/29/2029	1/29/2019	107.69704	104.4106961	101.2723459	98.27394506	95.40794455	92.66725997	90.04523992	87.5356365	85.13257813
211007A00005	10/7/2021	0.86	10/7/2024	10/7/2021	99.822151	98.00612793	96.23266516	94.50050596	92.80843946	91.15529839	89.53995718	87.9613302	86.41837004
160719A00026	7/19/2016	1.87	7/20/2026	7/19/2016	101.9268	100.0238572	98.17724559	96.38483404	94.64459057	92.95457466	91.31293247	89.71789224	88.16776015
210212A00004	2/12/2021	1.1	2/12/2036	2/12/2021	101.3415	94.99464153	89.20266622	83.90932535	79.06463363	74.62412053	70.54817739	66.80148631	63.3525201
120808A00006	8/8/2012	2.06	8/9/2027	8/8/2012	103.49494	101.0229536	98.64080095	96.344444519	94.13006201	91.99402591	89.93289849	87.94341748	86.0224865
160608A00028	6/8/2016	2.36	6/8/2026	6/8/2016	105.29256	102.0044418	98.84203193	95.79978231	92.87242146	90.0549409	87.3425803	84.73081371	82.2153365
180403A00014	4/3/2018	3.11	4/3/2025	4/3/2018	105.20892	102.8681499	100.5926778	98.38030844	96.22893518	94.13653433	92.10116143	90.12094769	88.19409653
190502A00016	5/2/2019	2.87	5/1/2026	5/2/2019	106.99103	103.6550202	100.4448736	97.35513734	94.38062334	91.51639632	88.75776003	86.10024425	83.53959264
210915A00026	9/15/2021	1.1	9/15/2026	9/15/2021	101.34525	97.86616579	94.52974976	91.32938177	88.25878591	85.31200854	82.48340004	79.76759773	77.15950977
180913A00012	9/13/2018	3.31	9/13/2033	9/13/2018	114.48919	108.537045	103.0213104	97.90460011	93.1530732	88.73606894	84.62578386	80.79698385	77.22674717

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160413A00014	4/13/2016	2.55	4/14/2031	4/13/2016	107.72379	103.3150787	99.1653322	95.2565525	91.57214405	88.09679166	84.81635271	81.71775908	78.78892794
170301A00031	3/1/2017	2.11	3/1/2024	3/1/2017	100.89631	100.1874905	99.49071661	98.80565036	98.13197136	97.46937143	96.81755408	96.17623389	95.54513598
170317A00039	3/17/2017	2.73	3/18/2024	3/17/2017	102.30134	100.9675279	99.65783038	98.37164748	97.10839805	95.86751966	94.64846789	93.45071562	92.27375232
170406A00033	4/6/2017	3.01	4/6/2027	4/6/2017	109.46166	105.3888736	101.5006364	97.78752263	94.2406351	90.8515766	87.61241896	84.51567441	81.55426884
190905A00023	9/5/2019	2.08	9/5/2029	9/5/2019	107.97543	101.9320705	96.28891051	91.01699486	86.08961741	81.48213242	77.17178551	73.13755934	69.36003254
191203A00009	12/3/2019	2.21	12/3/2029	12/3/2019	108.92013	102.6501103	96.8076837	91.3609891	86.28070857	81.53985529	77.11357616	72.97897217	69.11493477
170112A00015	1/12/2017	2.32	1/12/2027	1/12/2017	103.55613	101.371111	99.25760257	97.21266943	95.23351759	93.31748761	91.46204717	89.66478404	87.92339957
200326A00032	3/26/2020	1.49	3/26/2030	3/26/2020	102.77737	99.0821476	95.57974621	92.2581641	89.10624289	86.11360129	83.27057556	80.56816502	77.99798191
160212A00006	2/12/2016	1.57	2/13/2023	2/12/2016	100.24399	100.0446177	99.84616423	99.64862293	99.45198697	99.25624961	99.06140419	98.86744412	98.67436287
161005A00016	10/5/2016	2.32	10/6/2031	10/5/2016	106.96996	102.3485833	98.01254612	93.94107145	90.11506983	86.51699066	83.13068701	79.94129338	76.93511479
200306A00057	3/6/2020	0.92	3/8/2027	3/6/2020	101.42935	97.69812613	94.13374094	90.72778369	87.47231564	84.3598377	81.38326377	78.53589588	75.81140093
190205A00017	2/5/2019	3.36	2/5/2029	2/5/2019	114.63237	108.9274161	103.5669254	98.52785662	93.78884044	89.33005049	85.13308315	81.18084771	77.45746543
190925A00009	9/25/2019	2	9/25/2026	9/25/2019	104.47146	101.0099058	97.68916739	94.50271955	91.44437263	88.5082557	85.68879835	82.98071373	80.37898262
200512A00010	5/12/2020	1.48	5/10/2030	5/12/2020	104.21306	97.84885713	91.94305623	86.45972365	81.36593564	76.63151084	72.22876814	68.13230703	64.31880831
210915A00024	9/15/2021	1.1	9/15/2026	9/15/2021	101.34525	97.86616581	94.5297499	91.32938203	88.25878628	85.312009	82.48340059	79.76759836	77.15951048
140219A00005	2/19/2014	3.13	2/20/2029	2/19/2014	108.34915	104.9914927	101.7870692	98.72744549	95.80471698	93.01147096	90.34075271	87.78603406	85.34118431
190315A00023	3/15/2019	2.88	3/15/2034	3/15/2019	112.32468	106.2350625	100.6098823	95.40783375	90.59166625	86.12775704	81.98573	78.13811721	74.56005805
200520A00009	5/20/2020	1.63	5/20/2038	5/20/2020	104.79688	94.2774992	85.09460319	77.06225055	70.02181852	63.83782498	58.39441006	53.59237121	49.346662
210714A00017	7/14/2021	0.73	7/12/2024	7/14/2021	99.580826	98.07518436	96.60084048	95.1568666	93.74237215	92.35650162	90.99843284	89.66737527	88.36256849
200206A00031	2/6/2020	2.15	2/6/2030	2/6/2020	108.609	102.2211485	96.27812816	90.74611793	85.59405155	80.79338195	76.31786368	72.14335535	68.24763996
170303A00004	3/3/2017	2.8	3/4/2024	3/3/2017	102.35254	101.0441991	99.75897338	98.49629713	97.25562575	96.0364318	94.83820431	93.66044812	92.50268331
200501A00002	5/1/2020	1.3	5/1/2035	5/1/2020	101.8822	95.85960942	90.33602931	85.26340092	80.59875812	76.30364936	72.34362772	68.68780196	65.30844101
210420A00035	4/20/2021	1.92	4/20/2034	4/20/2021	105.98227	99.24267644	93.08637744	87.45554652	82.29859416	77.56945305	73.2269481	69.2342421	65.5583477
180914A00049	9/14/2018	3.37	9/14/2033	9/14/2018	114.84821	108.8774408	103.3444463	98.21172502	93.44532993	89.01450419	84.89135721	81.05057581	77.46916648
200814A00003	8/14/2020	0.96	8/14/2035	8/14/2020	100.53201	94.45380183	88.88946769	83.78856643	79.10610411	74.80190019	70.84003432	67.18836049	63.81807992
211208A00013	12/8/2021	1.63	12/8/2026	12/8/2021	103.62181	99.83785858	96.21733199	92.75225073	89.43507085	86.25865735	83.2162596	80.3014884	77.50829448
170406A00027	4/6/2017	2.61	4/8/2024	4/6/2017	102.22115	100.8357596	99.47632655	98.14218209	96.83267971	95.54719453	94.28512239	93.04587899	91.82889908
210809A00014	8/9/2021	1.06	8/7/2026	8/9/2021	101.1208	97.73367274	94.48212281	91.3599264	88.36118693	85.48031271	82.71199924	80.05121254	77.49317361
200429A00030	4/29/2020	1.41	4/29/2030	4/29/2020	103.65173	97.54773972	91.87618956	86.60353669	81.69902227	77.13442956	72.8838608	68.92353488	65.2316036
150601A00396	6/1/2015	3.61	1/3/2029	6/1/2015	108.64394	105.50927	102.5122794	99.64561837	96.90238253	94.27608655	91.76063578	89.35029998	87.0396891
150601A00739	6/1/2015	2.35	5/6/2025	6/1/2015	101.71742	100.470818	99.25188246	98.05976818	96.89366365	95.75278862	94.63639267	93.54375378	92.47417702
150601A01051	6/1/2015	4.91	2/7/2025	6/1/2015	108.74332	106.5532243	104.4203631	102.3428349	100.3188173	98.34656267	96.42439443	94.55070348	92.72394494
150601A00477	6/1/2015	3.21	6/1/2029	6/1/2015	109.53007	105.7507648	102.1559246	98.7348744	95.47763711	92.37488246	89.41788061	86.59845956	83.90896577

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160928A00033	9/28/2016	2.46	9/29/2036	9/28/2016	109.88615	102.6696062	96.1081495	90.13238369	84.68100479	79.69979194	75.14072864	70.96123936	67.12352554
150601A00919	6/1/2015	7.41	6/7/2030	6/1/2015	128.16618	123.3987	118.8873767	114.6158697	110.5690083	106.732702	103.0938557	99.64029285	96.36068459
220610A00068	6/10/2022	3.09	6/10/2025	6/10/2022	103.12856	101.7560965	100.4152119	99.10492031	97.82427255	96.57235669	95.34829626	94.15124856	92.9804031
150601A00871	6/1/2015	6.74	7/31/2028	6/1/2015	118.77194	115.4069546	112.1834557	109.094233	106.1325009	103.2918669	100.5663066	97.95013927	95.43800668
200225A00049	2/25/2020	1.79	2/24/2040	2/25/2020	106.09611	98.04149976	90.85186996	84.41935313	78.65081432	73.46570505	68.79424515	64.57588116	60.75797754
150601A00950	6/1/2015	6.76	12/18/2031	6/1/2015	130.02477	124.311292	118.9561586	113.9329281	109.2173317	104.7870803	100.621689	96.7023178	93.01162825
150601A00966	6/1/2015	4.84	2/3/2023	6/1/2015	100.62152	100.4855563	100.3501438	100.2152818	100.0809668	99.94719513	99.81396308	99.68126715	99.54910378
080423A00066	4/23/2008	4.41	4/24/2023	4/23/2008	101.80656	101.320343	100.8387743	100.3617917	99.88932984	99.42132462	98.95771306	98.49843339	98.04342499
150601A00864	6/1/2015	7.37	3/31/2028	6/1/2015	119.59689	116.3864752	113.3053801	110.3472545	107.5061104	104.7762961	102.1524743	99.62960277	97.20291607
970806A00018	8/1/1997	6.7	10/23/2026	8/1/1997	111.97187	109.8351905	107.7639092	105.7554781	103.8074659	101.9175535	100.083528	98.30327708	96.57478399
200401A00011	4/1/2020	0.68	4/3/2023	4/1/2020	100.03997	99.76063205	99.48315426	99.20751818	98.93370387	98.66169168	98.39146227	98.12299656	97.85627577
150601A00953	6/1/2015	6.6	6/10/2032	6/1/2015	131.3444	125.1663426	119.3977624	114.0069177	108.9647964	104.2448623	99.82282562	95.67643738	91.78530259
150601A00964	6/1/2015	5.25	1/6/2033	6/1/2015	122.36546	116.8480201	111.6979972	106.8863252	102.3865067	98.17436647	94.22782995	90.52672482	87.05260218
110414A00007	4/14/2011	3.95	1/21/2025	4/14/2011	104.21192	102.7695892	101.3589326	99.97898012	98.62880356	97.30751133	96.01424665	94.74818583	93.50853669
191231A00027	12/31/2019	1.9	4/28/2023	12/31/2019	100.22631	100.1001461	99.97433243	99.8488684	99.72375241	99.59898293	99.47455844	99.3504774	99.22673833
200210A00007	2/10/2020	1.78	2/10/2025	2/10/2023	101.91998	100.0106081	98.15019989	96.33714867	94.56991455	92.8470199	91.1670463	89.52863162	87.93046735
191114A00013	11/14/2019	1.9	11/14/2022	11/14/2019	100.07684	100.0379998	99.99920273	99.960452	99.92174754	99.88308924	99.84447702	99.80591081	99.76739051
150601A00906	6/1/2015	6.2	11/1/2029	6/1/2015	121.05825	116.8857256	112.9225092	109.1560692	105.5747238	102.167575	98.92445122	95.83585326	92.89290574
150601A00261	6/1/2015	3.19	2/11/2033	6/1/2015	116.6457	108.9514342	101.9175469	95.48068495	89.58403437	84.17660357	79.21259129	74.65082651	70.45427192
150601A00459	6/1/2015	2.42	5/16/2024	6/1/2015	101.08687	100.3182496	99.5630747	98.82097642	98.09160182	97.37461106	96.66967678	95.97648349	95.29472709
190102A00015	1/2/2019	2.97	1/3/2034	1/2/2019	112.15154	106.4365653	101.1416931	96.23055633	91.67028155	87.43112729	83.48616129	79.81097298	76.38341746
160928A00042	9/28/2016	3.05	9/29/2036	9/28/2021	114.10708	106.6804869	99.92446351	93.76820887	88.14916412	83.01198111	78.30762948	73.99262063	70.02833274
150601A00736	6/1/2015	2.87	5/1/2030	6/1/2015	107.72123	103.9600779	100.394496	97.01229478	93.80214054	90.75349176	87.85653831	85.10214557	82.48180315
200130A00027	1/31/2020	1.79	1/31/2025	1/31/2020	100.95434	99.80475467	98.67899228	97.57634804	96.49614799	95.4377439	94.40051203	93.38385199	92.38718562
150601A01013	6/1/2015	5.21	9/29/2023	6/1/2015	103.75712	102.8569429	101.9727201	101.1040276	100.2504569	99.41161343	98.5871163	97.77659774	96.97970247
150601A00897	6/1/2015	6.15	5/28/2029	6/1/2015	119.32143	115.492118	111.8431246	108.3642655	105.0460066	101.8794207	98.85614473	95.96834036	93.20865738
150601A00024	6/1/2015	5.58	11/8/2022	6/1/2015	100.12563	100.1034128	100.081215	100.0590401	100.0368883	100.0147594	99.99265339	99.97057028	99.94850999
150601A01048	6/1/2015	5.27	1/3/2025	6/1/2015	109.10742	107.0005415	104.9468678	102.9446719	100.992293	99.08813812	97.23067799	95.41844435	93.65002682
160928A00032	9/28/2016	2.52	9/29/2036	9/28/2016	110.3154	103.0774924	96.49624923	90.50212862	85.03369896	80.03662474	75.46278636	71.26951542	67.41892966
170130A00043	1/30/2017	2.64	1/29/2027	1/30/2017	104.08291	101.8353653	99.66375975	97.56484597	95.53553996	93.57291367	91.67418586	89.83671357	88.05798417
190823A00009	8/23/2019	1.8	8/23/2029	8/23/2019	104.10024	100.6952253	97.45464705	94.36895018	91.42920865	88.62708095	85.95476776	83.40497295	80.97086763
191115A00029	11/15/2019	2.07	11/15/2029	11/15/2019	104.69332	101.1720975	97.82558784	94.64337277	91.61574128	88.73363325	85.98859127	83.37271642	80.87862754
050823A00088	8/23/2005	4.78	8/25/2025	8/23/2005	110.47252	107.8183441	105.2456709	102.7515138	100.333016	97.98744171	95.71217055	93.50469171	91.36259878

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150601A00270	6/1/2015	3.12	3/21/2031	6/1/2015	116.00703	108.7975973	102.1407954	95.99008242	90.3031093	85.04131959	80.16958996	75.65590664	71.47107401
110824A00006	8/24/2011	2.69	8/24/2026	8/24/2011	104.58261	102.2274278	99.94870079	97.74336173	95.6084881	93.54129372	91.53912143	89.5994363	87.71981924
070518A00023	5/18/2007	5.46	5/18/2027	5/18/2007	112.00861	109.3274119	106.7436135	104.2528033	101.8508051	99.53366147	97.29762091	95.13912539	93.05479932
160930A00032	9/30/2016	2.15	9/30/2031	9/30/2016	105.94926	101.542208	97.40136255	93.50764429	89.84350416	86.39278994	83.140625	80.07329826	77.17816443
150601A01041	6/1/2015	5.99	10/2/2036	6/1/2015	138.23672	129.2455501	121.0712037	113.627767	106.8392382	100.6383023	94.96526648	89.76713424	84.99679811
190520A00020	5/20/2019	2.39	5/20/2026	5/20/2019	102.99012	101.1703665	99.40245192	97.68447234	96.01461121	94.39113178	92.81237293	91.27674532	89.78272781
130207A00012	2/7/2013	2.9	2/7/2033	2/7/2013	110.38236	105.0063352	100.0095098	95.36034928	91.03022713	86.99313834	83.22543968	79.70561723	76.41407836
050812A00050	8/12/2005	4.97	8/12/2025	8/12/2005	107.35915	105.5109816	103.7107935	101.9569851	100.2480186	98.58241856	96.9587692	95.37571122	93.83193919
120410A00005	4/10/2012	2.35	4/12/2027	4/10/2012	104.19772	101.6925295	99.27799485	96.95005303	94.70485253	92.53874063	90.44825186	88.43009716	86.48115376
150601A00690	6/1/2015	2.34	2/28/2025	6/1/2015	101.5591	100.4094342	99.28401764	98.1821311	97.10308301	96.0462082	95.01086664	93.99644223	93.00234171
170130A00046	1/30/2017	2.52	1/30/2026	1/30/2017	102.83133	101.0881817	99.39362697	97.74587167	96.14320478	94.58399291	93.06667603	91.58976351	90.15183041
150601A00448	6/1/2015	2.61	4/26/2024	6/1/2015	101.19695	100.4513097	99.71858937	98.99843612	98.29051115	97.5944883	96.91005338	96.23690366	95.57474732
160928A00041	9/28/2016	3.26	9/29/2036	9/30/2019	115.60944	108.1080885	101.2828126	95.06231615	89.38359371	84.1908959	79.43483147	75.07158685	71.06224717
150601A00943	6/1/2015	6.44	5/9/2031	6/1/2015	126.94173	121.6404603	116.6547969	111.9626029	107.5434793	103.3786119	99.45063748	95.74352142	92.2424468
050823A00085	8/23/2005	4.78	8/25/2025	8/23/2005	110.4725	107.8183287	105.2456604	102.751508	100.3330147	97.98744475	95.71217774	93.50470286	91.36261373
170130A00039	1/30/2017	2.74	1/31/2028	1/30/2017	105.3987	102.6414986	99.99398443	97.45077063	95.00677445	92.6572016	90.39752764	88.22348075	86.13102573
200310A00067	3/10/2020	0.94	3/10/2025	3/10/2020	99.966784	98.74686084	97.55329405	96.38529323	95.24209856	94.12297919	93.02723195	91.95418002	90.90317171
150601A00905	6/1/2015	6.14	10/29/2029	6/1/2015	120.59377	116.4795159	112.569729	108.8522768	105.315839	101.949849	98.74443845	95.69038678	92.77907384
150601A00993	6/1/2015	5.37	6/9/2034	6/1/2015	128.42322	121.3058444	114.7423286	108.6825353	103.0813301	97.89804533	93.09600401	88.64209734	84.50641008
181220A00006	12/20/2018	2.93	12/20/2022	12/20/2018	100.31665	100.2056052	100.0948231	99.98430646	99.87405441	99.76406592	99.65433998	99.54487559	99.43567176
150601A00473	6/1/2015	2.22	5/31/2024	6/1/2015	101.05596	100.2635071	99.48506228	98.72024285	97.96867945	97.23001643	96.50391123	95.79003377	95.08806586
150601A00527	6/1/2015	2.5	7/26/2024	6/1/2015	101.29142	100.4246255	99.57362697	98.73798028	97.91726244	97.11106637	96.31900019	95.54068644	94.77576144
150601A00893	6/1/2015	6.49	4/6/2029	6/1/2015	120.4118	116.5779353	112.9229051	109.4367044	106.1099602	102.9338905	99.90026385	97.00136027	94.22993661
190327A00030	3/27/2019	2.9	3/27/2036	3/27/2019	112.27273	105.6133409	99.52150259	93.94050169	88.81988472	84.11471449	79.78492075	75.79473189	72.11217706
200317A00024	3/17/2020	1.09	3/17/2025	3/17/2020	100.15514	98.93299729	97.7372779	96.56718441	95.42195465	94.30085559	93.20318194	92.12825487	91.07542077
150601A00030	6/1/2015	5.28	11/26/2027	6/1/2015	120.95625	116.1681253	111.6180123	107.2925368	103.1791537	99.26609085	95.54229755	91.99739583	88.62163595
140911A00033	9/11/2014	3.02	9/13/2027	9/11/2014	107.90609	104.3771236	101.002315	97.77376523	94.68403379	91.7261056	88.89336412	86.17956646	83.57882012
150601A01040	6/1/2015	5.4	10/2/2026	6/1/2015	116.69428	112.9790705	109.4135194	105.9907054	102.7040637	99.54736812	96.51471167	93.60048847	90.79937675
150601A00928	6/1/2015	5.94	8/21/2030	6/1/2015	120.32762	116.0842762	112.0660343	108.2585345	104.6484486	101.2234033	97.97190384	94.88326633	91.94755404
130624A00019	6/24/2013	3.4	6/26/2023	6/24/2013	101.6093	100.9388055	100.2770009	99.62371951	98.97879765	98.34207585	97.71339865	97.09261451	96.47957568
150601A00931	6/1/2015	7.13	9/20/2030	6/1/2015	127.82328	122.917562	118.2830125	113.9018719	109.7576831	105.8351896	102.1202397	98.59969863	95.26136865
130206A00004	2/6/2013	2.14	2/7/2028	2/6/2013	104.27442	101.4561856	98.75094078	96.15316257	93.65763826	91.25944581	88.95393568	86.73671395	84.60362662
170130A00036	1/30/2017	3.11	1/31/2033	1/30/2017	111.43154	106.1271594	101.1877699	96.58365922	92.28781168	88.27564247	84.52475976	81.01475199	77.72699721

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150601A00946	6/1/2015	6.28	8/22/2031	6/1/2015	126.98922	121.5194389	116.384212	111.5594869	107.0231386	102.7548016	98.73571735	94.94859636	91.37749257
160928A00044	9/28/2016	2.89	9/29/2036	9/28/2023	112.96242	105.5927904	98.8895309	92.78222238	87.20864634	82.11376032	77.44880891	73.17055113	69.24058841
210514A00010	5/14/2021	1.34	5/14/2031	5/14/2021	102.92299	98.7326973	94.7891504	91.07511916	87.57471936	84.27329968	81.15733718	78.21434234	75.43277265
150601A00875	6/1/2015	7.14	9/29/2028	6/1/2015	120.55444	117.0633653	113.7222919	110.5234212	107.4594198	104.5233875	101.7088283	99.0096243	96.42001093
150601A00900	6/1/2015	6.06	6/28/2024	6/1/2015	104.20951	103.3763127	102.5579223	101.7539304	100.9639458	100.1875918	99.42450544	98.67433718	97.93675002
181211A00042	12/11/2018	3.7	12/11/2028	12/11/2023	114.43837	109.32861	104.5120058	99.9696421	95.68393656	91.63853956	87.81824087	84.20888381	80.79728641
970806A00059	8/1/1997	8.25	9/22/2025	8/1/1997	110.70807	109.1550509	107.6395077	106.1602338	104.7160673	103.3058928	101.9286393	100.5832778	99.26881963
150601A00883	6/1/2015	6.21	11/30/2028	6/1/2015	117.93021	114.433454	111.0903913	107.8928665	104.8332158	101.9042365	99.09915625	96.4116041	93.83558425
150601A00899	6/1/2015	7.07	6/14/2029	6/1/2015	120.51754	116.9041539	113.4567436	110.1660385	107.0233552	104.0205604	101.1500326	98.40462551	95.77763592
150601A00976	6/1/2015	6.8	9/22/2033	6/1/2015	135.22619	128.2992684	121.8770483	115.9164826	110.3785919	105.2280476	100.432802	95.96375881	91.79447862
200331A00056	3/31/2020	0.96	3/29/2030	3/31/2020	101.26498	97.65374348	94.23039393	90.98325307	87.90145914	84.97490671	82.19418876	79.55054351	77.03580572
150601A00939	6/1/2015	5.79	1/17/2031	6/1/2015	122.44909	117.5935906	113.0155547	108.6962197	104.6182407	100.765577	97.12338523	93.67792121	90.41645106
171206A00020	12/6/2017	2.62	12/6/2027	12/6/2017	104.81334	102.2055688	99.69684364	97.28252825	94.95823838	92.71982606	90.56336521	88.48513821	86.48162347
150601A00929	6/1/2015	5.91	8/30/2030	6/1/2015	122.35093	117.6409582	113.1917118	108.9860966	105.0082794	101.2435826	97.67839173	94.30007102	91.09688644
210409A00010	4/9/2021	1.05	4/9/2031	4/9/2021	101.6726	97.55536699	93.67896014	90.02667687	86.58311261	83.33405032	80.26636049	77.3679102	74.62748037
150601A00678	6/1/2015	2.12	1/30/2025	6/1/2015	101.27099	100.1503166	99.05294644	97.9781897	96.9253855	95.89389829	94.88311659	93.89245181	92.92133724
181029A00097	10/29/2018	3.53	10/27/2028	10/29/2018	113.67651	108.6848312	103.9738052	99.5256537	95.3238292	91.35292312	87.59858112	84.0474253	80.68698246
190102A00020	1/2/2019	2.97	1/3/2034	1/2/2019	112.15147	106.4365393	101.1417086	96.23060759	91.67036347	87.43123545	83.4862918	79.81112246	76.38358295
200428A00018	4/28/2020	1.33	4/27/2035	4/28/2020	102.07158	96.22669524	90.85729788	85.91818663	81.36890538	77.17320468	73.29857059	69.7158097	66.39868295
120827A00052	8/27/2012	2.01	8/27/2027	8/27/2012	103.87499	101.0730508	98.37951916	95.78930299	93.2975813	90.89979181	88.59161539	86.36896159	84.22795507
970806A00017	8/1/1997	7.02	7/23/2026	8/1/1997	111.78859	109.7856424	107.8409443	105.9523129	104.117667	102.3350187	100.6024684	98.91819992	97.28047662
150601A00038	6/1/2015	5.77	6/2/2023	6/1/2015	102.87007	102.2814322	101.6996152	101.1244961	100.5559592	99.99389185	99.4381836	98.88872664	98.34541561
191114A00014	11/14/2019	1.9	11/14/2023	11/14/2019	100.56764	99.99008246	99.42094334	98.86001411	98.3070978	97.76200406	97.2245489	96.69455439	96.17184842
150601A00018	6/1/2015	4.91	9/5/2025	6/1/2015	110.95124	108.215637	105.5656937	102.9982415	100.5102516	98.09882307	95.7611774	93.49465218	91.29669575
200402A00050	4/6/2020	0.73	4/5/2024	4/6/2020	99.794822	99.01899111	98.25656888	97.50719131	96.77050777	96.04618066	95.33388478	94.63330676	93.94414447
150601A01016	6/1/2015	5.73	10/28/2025	6/1/2015	113.53714	110.6815833	107.9187215	105.2449873	102.6569722	100.1514189	97.72521322	95.37537733	93.09906261
150601A00971	6/1/2015	6.42	6/20/2033	6/1/2015	132.23659	125.4375495	119.1297241	113.2717454	107.8260956	102.7587207	98.0386859	93.63786614	89.53067023
150601A00888	6/1/2015	5.92	3/1/2029	6/1/2015	117.90512	114.2290604	110.7219469	107.3744399	104.1777876	101.1237845	98.20473372	95.41341183	92.74303659
121120A00010	11/20/2012	1.93	11/22/2027	11/20/2012	103.34804	100.7764978	98.309206	95.94103235	93.66713457	91.48294263	89.38414144	87.36665501	85.42663149
150601A00023	6/1/2015	5.46	10/30/2037	6/1/2015	136.57829	126.9805099	118.3179302	110.4854686	103.3909508	96.95341939	91.10167425	85.77301411	80.91214887
120217A00007	2/17/2012	2.25	2/20/2024	2/17/2012	101.50823	100.3908359	99.29442768	98.21840575	97.16219816	96.12525474	95.10704604	94.10706234	93.1248127
130925A00035	9/25/2013	1.53	6/25/2025	9/25/2013	101.19669	99.54924112	97.94271639	96.37575577	94.84705197	93.35535194	91.89945415	90.47820605	89.09050159
180529A00057	5/29/2018	3.09	5/30/2028	5/29/2018	108.8427	105.2569701	101.8404122	98.58357817	95.47761495	92.5142221	89.68561383	86.98448383	84.40397271

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210514A00007	5/14/2021	0.95	5/15/2028	5/14/2021	100.91689	98.16958719	95.53451855	93.00608488	90.57901208	88.24832637	86.00933518	83.85760928	81.78896624
150601A01005	6/1/2015	5.82	3/10/2025	6/1/2015	110.92574	108.6608606	106.4567708	104.311482	102.2230848	100.1897437	98.20969303	96.2812344	94.40273344
191231A00021	12/31/2019	1.9	2/28/2023	12/31/2019	100.22631	100.1001529	99.97434536	99.84888746	99.7237776	99.59901424	99.47459587	99.35052095	99.22678798
150601A00948	6/1/2015	6.04	10/22/2031	6/1/2015	122.82826	117.9364346	113.3355443	109.0048978	104.9254565	101.0796914	97.45145221	94.02584832	90.78914147
150601A00395	6/1/2015	2.86	1/3/2024	6/1/2015	101.11073	100.5215129	99.94166626	99.37093708	98.80908613	98.25588301	97.71110573	97.17454033	96.64598046
121220A00023	12/20/2012	1.82	12/20/2022	12/20/2012	100.24532	100.1042959	99.96367241	99.82345236	99.68363398	99.54421551	99.4051952	99.2665713	99.12834209
150601A00001	6/1/2015	5.43	6/15/2037	6/1/2015	135.51113	126.2049781	117.7857495	110.1558997	103.2296232	96.93134298	91.19440607	85.9599549	81.17594939
150601A00425	6/1/2015	2.64	2/21/2024	6/1/2015	101.08185	100.4255379	99.78041905	99.14618066	98.52252056	97.90914831	97.30578464	96.71216087	96.12801841
150601A00426	6/1/2015	3.37	2/21/2029	6/1/2015	108.09361	104.9030728	101.8554125	98.94286285	96.15814116	93.49441356	90.9452644	88.50466775	86.16696101
121120A00011	11/20/2012	2.22	11/22/2027	11/20/2012	106.1636	102.4361132	98.88772606	95.50856841	92.2893764	89.22144986	86.2966147	83.50718798	80.84594567
120621A00009	6/21/2012	3.18	6/21/2032	6/21/2012	114.31898	107.6350052	101.4767524	95.79720737	90.55391602	85.70851514	81.22631249	77.07591222	73.22888064
180126A00018	1/26/2018	2.34	1/26/2023	1/26/2018	100.36027	100.195565	100.0314821	99.86801892	99.70517168	99.54293654	99.38130975	99.22028756	99.05986629
150601A00927	6/1/2015	6.08	8/7/2030	6/1/2015	120.77035	116.5351785	112.5236357	108.72151	105.115612	101.6936934	98.44437278	95.35706811	92.42193489
200316A00008	3/16/2020	1.31	3/15/2030	3/16/2020	102.05258	98.43928126	95.01317139	91.76265131	88.67693373	85.74598027	82.96044427	80.3116183	77.79138605
150601A00872	6/1/2015	7.42	7/31/2028	6/1/2015	120.67726	117.3009404	114.0657966	110.9646578	107.9907742	105.1377863	102.3996998	99.77086165	97.24593915
150601A00558	6/1/2015	2.51	8/30/2024	6/1/2015	101.37292	100.4582857	99.56070551	98.67969855	97.81480672	96.96558903	96.13162078	95.31249277	94.50781064
120119A00015	1/19/2012	2.27	1/19/2024	1/19/2012	101.38688	100.3542366	99.34519116	98.35891658	97.39462362	96.45155939	95.52900526	94.62627493	93.74271267
160928A00029	9/28/2016	2.52	9/29/2036	9/28/2016	110.3154	103.0774924	96.49624923	90.50212862	85.03369896	80.03662474	75.46278636	71.26951542	67.41892966
140414A00009	4/14/2014	2.32	4/30/2024	4/14/2014	101.45474	100.4492269	99.46090627	98.48935311	97.5341525	96.59490337	95.67121788	94.7627209	93.86904944
030605A00010	6/5/2003	3.97	6/5/2023	6/5/2003	101.9068	101.3056154	100.7115281	100.1244158	99.54415586	98.97062883	98.40371783	97.84330872	97.28928998
150601A00952	6/1/2015	6.34	2/13/2032	6/1/2015	128.85888	122.9971301	117.5120638	112.3753232	107.5609205	103.0450258	98.80577222	94.82308055	91.07850002
190102A00022	1/2/2019	2.97	1/3/2034	1/2/2019	112.1514	106.4365148	101.1417233	96.2306559	91.67044067	87.43133736	83.48641479	79.81126332	76.38373889
150601A00865	6/1/2015	6	4/3/2028	6/1/2015	114.34573	111.4661484	108.6995018	106.0403305	103.4834814	101.024088	98.65755176	96.3795258	94.18589946
160928A00030	9/28/2016	2.52	9/29/2036	9/28/2016	110.3154	103.0774924	96.49624923	90.50212862	85.03369896	80.03662474	75.46278636	71.26951542	67.41892966
150601A00035	6/1/2015	5.73	4/1/2038	6/1/2015	134.98066	126.3274348	118.486635	111.3683796	104.8937794	98.99349453	93.60649115	88.67896853	84.16343364
120827A00048	8/27/2012	2.01	8/27/2027	8/27/2012	103.87499	101.07305	98.37951943	95.78930431	93.2975836	90.89979502	88.59161945	86.36896644	84.22796066
121217A00009	12/17/2012	2.02	12/17/2027	12/17/2012	103.70773	101.0483994	98.49787365	96.05072436	93.7018377	91.44639145	89.2798363	87.19787845	85.19646351
150601A00033	6/1/2015	5.96	12/24/2025	6/1/2015	115.17039	112.1033996	109.1400849	106.2762907	103.5080521	100.8315882	98.24329284	95.73972466	93.31759878
200311A00028	3/11/2020	1.04	3/12/2024	3/11/2020	100.04208	99.26861611	98.50835507	97.76094398	97.02604114	96.3033174	95.59245559	94.8931499	94.20510542
200326A00037	3/26/2020	1.78	3/26/2035	3/26/2020	104.83158	98.9121743	93.46961532	88.45893644	83.839859	79.57626293	75.63572404	71.98910597	68.61020005
150601A00509	6/1/2015	2.52	7/8/2024	6/1/2015	101.26896	100.4283968	99.60296871	98.79225814	97.99586259	97.21339462	96.44448116	95.68876278	94.94589309
150601A00832	6/1/2015	7.17	8/28/2025	6/1/2015	108.70013	107.2352831	105.8052774	104.4089937	103.0453591	101.7133437	100.411958	99.14025178	97.8973115
150601A00475	6/1/2015	3.04	6/1/2029	6/1/2015	107.37754	104.0682312	100.9127754	97.90252404	95.02938116	92.28576543	89.66457381	87.15914813	84.7632441

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150601A01012	6/1/2015	5.43	9/15/2023	6/1/2015	103.79855	102.9343401	102.0848326	101.2496562	100.4284481	99.62085787	98.82654667	98.04518689	97.27646164
170929A00046	9/29/2017	2.49	9/30/2027	9/29/2017	104.22703	101.74899	99.36141147	97.06020949	94.84151012	92.70164191	90.63712393	88.64465451	86.7211008
150601A00955	6/1/2015	5.84	7/15/2032	6/1/2015	124.27353	118.9363928	113.9394838	109.2569602	104.8651802	100.742496	96.86907102	93.22671397	89.79873023
160930A00033	9/30/2016	1.8	9/30/2026	9/30/2016	101.87303	99.91095986	98.00874401	96.16406037	94.37469669	92.63854225	90.95358241	89.31789357	87.72963841
150601A00851	6/1/2015	7.12	4/30/2027	6/1/2015	115.28772	112.7171543	110.2352475	107.8381951	105.5223862	103.2843898	101.120945	99.02895129	97.00545933
150601A01047	6/1/2015	5.35	12/30/2024	6/1/2015	109.22575	107.1271744	105.0814028	103.086722	101.1414906	99.24413384	97.39313957	95.58705572	93.82448715
220629A00034	6/29/2022	3.51	6/29/2027	6/29/2022	106.42185	104.0297165	101.7210437	99.49220112	97.33974359	95.26040013	93.25106402	91.3087834	89.43075246
150601A00868	6/1/2015	7.08	6/5/2028	6/1/2015	119.39503	116.0848595	112.9116572	109.8685399	106.9490218	104.1469886	101.4566733	98.8726349	96.38973698
111007A00007	10/7/2011	3.92	10/7/2031	10/7/2011	120.36121	112.9344369	106.0846279	99.76179505	93.9206088	88.51993957	83.52244503	78.89420011	74.60436491
150601A00005	6/1/2015	4.84	6/9/2025	6/1/2015	109.85968	107.352971	104.9195209	102.5567138	100.2620499	98.03313539	95.86767696	93.76347697	91.71842868
130624A00017	6/24/2013	3.4	6/26/2023	6/24/2013	101.6093	100.9388055	100.2770009	99.62371951	98.97879765	98.34207585	97.71339865	97.09261451	96.47957568
150601A00410	6/1/2015	2.68	1/24/2024	6/1/2015	101.04621	100.4298078	99.82364182	99.22742747	98.64089227	98.06377427	97.49582146	96.9367913	96.3864503
150601A00988	6/1/2015	4.57	3/22/2024	6/1/2015	102.48608	101.7822154	101.0903189	100.4100634	99.74113404	99.08322786	98.4360532	97.79932912	97.17278492
170313A00041	3/13/2017	3.21	3/15/2032	3/13/2017	111.13116	106.3367855	101.8438755	97.62993313	93.67434226	89.95819279	86.46412686	83.17619994	80.07975524
150601A00889	6/1/2015	6.55	3/2/2029	6/1/2015	120.52842	116.7109694	113.0701824	109.5962565	106.2800032	103.1128093	100.0865971	97.19378702	94.42726393
200203A00046	2/3/2020	1.98	2/3/2040	2/3/2020	107.69024	99.54959723	92.28115874	85.77631862	79.94128862	74.69494133	69.9669828	65.696403	61.83015998
150601A01015	6/1/2015	5.61	10/28/2025	6/1/2015	113.21171	110.360911	107.6026932	104.9334889	102.3498934	99.84865282	97.42665656	95.08093	92.80862773
150601A00935	6/1/2015	6.46	11/21/2030	6/1/2015	125.30856	120.3967567	115.7616584	111.3848164	107.2491643	103.3389009	99.63938779	96.13705561	92.81931848
150601A00022	6/1/2015	5.43	10/26/2037	6/1/2015	132.03254	123.7344553	116.1991191	109.3439467	103.0962417	97.39192227	92.17442212	87.39374012	83.00561758
150601A00918	6/1/2015	5.62	4/28/2025	6/1/2015	105.94324	104.6610258	103.4068302	102.1798044	100.9791348	99.80403884	98.65376385	97.52758546	96.42480638
150601A00496	6/1/2015	2.27	6/27/2024	6/1/2015	101.14268	100.3158019	99.50374318	98.70609905	97.9224761	97.15249566	96.39579308	95.65201702	94.92082887
200521A00005	5/21/2020	0.75	5/21/2030	5/21/2020	100.47455	96.80652275	93.33324196	90.04237533	86.92247065	83.96288662	81.15372988	78.48579714	75.95052228
140311A00039	3/11/2014	3.06	3/11/2024	3/11/2014	102.50552	101.2651194	100.0462534	98.84839724	97.67104702	96.5137147	95.37592742	94.25722691	93.15716892
190628A00007	6/28/2019	2.28	6/28/2034	6/28/2019	108.46515	102.6958124	97.36637727	92.43746766	87.87360854	83.6428119	79.71620647	76.06770931	72.67373426
130913A00018	9/13/2013	3.72	9/13/2028	9/13/2013	110.03714	106.5073804	103.136305	99.91534704	96.83646176	93.89209472	91.07514887	88.3789539	85.79723778
150601A00912	6/1/2015	5.96	11/30/2029	6/1/2015	120.17497	116.0193982	112.0726914	108.322332	104.7566464	101.3647451	98.13646506	95.06231638	92.13343279
150601A00411	6/1/2015	3.38	1/24/2029	6/1/2015	108.01929	104.8699382	101.8600895	98.98223816	96.22933929	93.59477828	91.07234172	88.65619027	86.34083353
190102A00024	1/2/2019	2.97	1/3/2034	1/2/2019	112.15143	106.4365259	101.1417166	96.23063401	91.67040568	87.43129118	83.48635905	79.81119948	76.38366821
150601A00960	6/1/2015	6.49	12/16/2032	6/1/2015	128.39597	122.7085318	117.3954313	112.4273203	107.7774237	103.4212959	99.33659961	95.50290774	91.90152539
150601A00978	6/1/2015	6.32	11/24/2033	6/1/2015	129.75569	123.5321966	117.7503813	112.3730125	107.3663635	102.6998507	98.3457155	94.27874073	90.47599768
160210A00041	2/10/2016	1.97	2/10/2023	2/10/2016	100.42263	100.1403639	99.8596862	99.58058728	99.30305382	99.02707262	98.75263064	98.47971498	98.20831289
160520A00017	9/20/2017	2.34	9/20/2024	9/20/2017	102.61645	100.752362	98.93120483	97.15173856	95.41276664	93.71313451	92.05172783	90.42747089	88.83932496
180518A00046	5/25/2018	3.62	5/18/2027	5/25/2018	113.43771	108.8015868	104.3855464	100.1779501	96.16783389	92.34486896	88.69932161	85.22201565	81.90429746

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191002A00038	1/13/2020	1.76	1/13/2023	1/13/2020	100.29459	100.0896513	99.8855593	99.68231155	99.47990271	99.27832756	99.07758089	98.87765755	98.67855242
191002A00044	2/3/2020	1.75	2/3/2023	2/3/2020	100.34435	100.0814921	99.82000831	99.55988887	99.30112316	99.04370064	98.7876109	98.53284362	98.2793886
190329A00012	3/29/2019	2.61	3/29/2024	3/29/2019	102.23631	100.8397699	99.46899258	98.12332953	96.80215117	95.50484847	94.23083215	92.97953184	91.75039539
130211A00016	2/11/2013	2.27	2/15/2023	2/11/2013	100.52437	100.2281612	99.93370886	99.64099297	99.34999809	99.06070904	98.77311078	98.48718849	98.20292747
190829A00080	8/29/2019	1.8	12/29/2023	8/29/2019	100.86415	99.71514653	98.59219629	97.49441801	96.42097302	95.37105955	94.34391071	93.33879258	92.35500249
141215A00062	12/15/2014	2.65	12/16/2024	12/15/2014	103.95765	101.8439477	99.78369155	97.77516226	95.81670984	93.90674999	92.04376087	90.22628012	88.45290201
160212A00037	2/12/2016	3.03	2/12/2031	2/12/2016	116.92248	108.6088432	100.962921	93.92728131	87.44972001	81.48276089	75.98320462	70.91172294	66.23249325
160712A00019	7/12/2017	2.32	7/12/2027	7/12/2017	107.89345	103.2357009	98.80687718	94.59449102	90.58680284	86.7727753	83.14202721	79.68479061	76.39187108
180618A00036	6/18/2018	3.89	6/18/2048	6/18/2018	148.7626	124.6444469	105.3700898	89.89232346	77.399468	67.26095057	58.98572975	52.19047649	46.57517883
180621A00068	6/21/2018	3.32	6/23/2025	6/21/2018	106.47354	103.827331	101.2607654	98.77094841	96.3551099	94.01059921	91.73487911	89.5255201	87.38019499
170412A00019	4/12/2017	2.56	4/12/2024	4/12/2017	102.22572	100.7917676	99.38495571	98.00457828	96.64995584	95.32043175	94.01537119	92.7341603	91.4762053
180726A00046	7/26/2018	3.2	12/26/2023	7/26/2018	102.4844	101.3333521	100.2081605	99.10795805	98.03191862	96.97925212	95.9492026	94.94104639	93.95409044
190829A00078	8/29/2019	1.8	12/15/2023	8/29/2019	100.83008	99.71831858	98.63096716	97.56723028	96.5263451	95.50758131	94.51023947	93.53364932	92.57716832
190515A00032	5/15/2019	2.49	5/15/2024	5/15/2019	102.2539	100.7322019	99.24063842	97.77838944	96.34465956	94.93868176	93.55971609	92.20704853	90.87998979
190501A00014	5/1/2019	2.62	5/1/2024	5/1/2019	102.4004	100.9141277	99.45691583	98.02798915	96.62659672	95.25201365	93.90353996	92.58049958	91.28223927
190621A00035	6/21/2019	2.19	12/15/2023	6/21/2019	101.2717	100.157284	99.06731759	98.00100527	96.95758321	95.93632015	94.9365157	93.95749871	92.99862578
160210A00053	2/10/2016	1.99	2/10/2023	2/10/2016	100.4283	100.1460166	99.86532839	99.58621902	99.30867515	99.03268359	98.75823129	98.48530535	98.21389303
180911A00007	9/11/2018	3.12	9/8/2023	9/11/2018	101.79446	100.9382289	100.0963973	99.26860395	98.45449956	97.6537464	96.86601776	96.09099751	95.3283797
081219A00006	12/19/2008	3.88	12/22/2023	12/19/2008	103.36844	102.2207709	101.0986456	100.001213	98.92766356	97.87722285	96.84914957	95.84273386	94.85729566
160830A00068	11/30/2016	1.95	11/30/2023	11/30/2016	100.95728	99.88450882	98.83443689	97.80634993	96.79956342	95.81342099	94.84729298	93.90057509	92.97268714
171110A00019	5/4/2018	2.46	5/4/2023	5/4/2018	100.84792	100.3377412	99.8327197	99.3327742	98.83782842	98.34780762	97.86263855	97.38224939	96.90656975
200131A00031	1/31/2020	1.74	1/31/2024	1/31/2020	100.86262	99.62669224	98.42088517	97.2441101	96.09532899	94.97355276	93.87783838	92.80728628	91.76103786
170822A00023	8/23/2017	3.95	8/23/2028	8/23/2017	118.85428	112.8312056	107.1601207	101.8185232	96.7854635	92.04143054	87.56824584	83.3489659	79.36779212
160819A00015	10/12/2016	2.3	10/13/2026	10/12/2016	106.28907	102.3832805	98.64319107	95.06091646	91.62898586	88.34032114	85.18821404	82.16630485	79.26856252
170614A00019	6/14/2017	2.48	6/13/2025	6/14/2017	104.19749	101.608649	99.09733074	96.66073342	94.29618013	92.00110829	89.77306389	87.60969612	85.50875221
160225A00024	2/25/2016	2.22	2/26/2024	2/25/2016	101.58445	100.2759416	98.99127279	97.72982781	96.49101383	95.2742581	94.07900704	92.90472546	91.75089581
180925A00033	9/25/2018	3.26	9/25/2023	9/25/2018	102.00759	101.104808	100.2180033	99.34675341	98.49065155	97.64930495	96.82233432	96.00937328	95.21006782
180821A00029	8/21/2018	3.01	8/21/2023	8/21/2018	101.62312	100.8158281	100.0213615	99.23941222	98.46968604	97.71189773	96.96577091	96.23103768	95.5074383
190829A00075	8/29/2019	1.8	6/15/2023	8/29/2019	100.55828	99.93539982	99.32022299	98.71260608	98.11241025	97.51950005	96.93374332	96.35501108	95.78317742
180328A00042	3/28/2018	2.95	3/28/2023	3/28/2018	100.93106	100.5215333	100.1153272	99.71240017	99.3127128	98.9162261	98.52290176	98.13270206	97.7455899
160223A00012	2/23/2016	1.89	2/23/2023	2/23/2016	100.46172	100.1433166	99.82693357	99.51255097	99.20014981	98.88971138	98.58121719	98.27464901	97.96998883
181206A00018	12/6/2018	3.13	12/6/2023	12/6/2018	102.28139	101.1849147	100.1119366	99.06171069	98.03351836	97.02667116	96.04050906	95.07439897	94.12773345
190830A00020	8/31/2020	1.67	8/31/2023	8/31/2020	100.53438	99.70537152	98.88997553	98.08785668	97.298693	96.52217282	95.75799443	95.0058656	94.2655033

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150731A00016	7/31/2015	3.04	7/31/2025	7/31/2015	105.97577	103.2361515	100.581601	98.00892056	95.51505464	93.09708496	90.75222322	88.47780416	86.27127915
171228A00023	12/28/2017	2.69	3/29/2024	12/28/2017	102.34991	100.9525245	99.58092019	98.23444417	96.91246645	95.61437765	94.33958811	93.08752716	91.8576423
161125A00002	11/25/2016	2.62	11/27/2023	11/25/2016	101.67521	100.6062434	99.55970655	98.53490026	97.53115289	96.54782025	95.5842842	94.6399513	93.71425167
191002A00046	2/14/2020	1.75	2/14/2023	2/14/2020	100.368	100.0748422	99.78340496	99.49367114	99.20562579	98.91925413	98.63454154	98.35147359	98.07003601
160520A00018	9/20/2017	2.34	9/20/2024	9/20/2017	102.61645	100.752362	98.93120483	97.15173856	95.41276664	93.71313451	92.05172783	90.42747089	88.83932496
181220A00041	12/20/2018	3.36	12/18/2026	12/20/2018	111.03429	106.8580543	102.8645317	99.04471689	95.39010181	91.89264341	88.54473554	85.33918259	82.26917495
190815A00040	8/15/2019	1.86	8/15/2023	8/15/2019	100.67829	99.89124297	99.11647214	98.35368831	97.60261479	96.86298333	96.13453386	95.41701411	94.71017938
190829A00076	8/29/2019	1.81	6/30/2023	8/29/2019	100.58052	99.91718197	99.26256118	98.61648485	97.97878667	97.34930465	96.72788094	96.11436169	95.50859697
160210A00042	2/10/2016	2.57	2/10/2026	2/10/2016	105.78102	102.5310334	99.39828463	96.37787207	93.46513343	90.65562893	87.94512918	85.32960378	82.80521065
180615A00039	6/15/2018	3.49	6/15/2028	6/15/2018	115.76606	110.0136545	104.5892116	99.47222614	94.64358538	90.08546545	85.78123751	81.71538138	77.87340579
191002A00043	2/3/2020	1.75	2/3/2023	2/3/2020	100.34435	100.0814921	99.82000831	99.55988887	99.30112316	99.04370064	98.7876109	98.53284362	98.2793886
150601A00356	6/1/2015	3.66	9/22/2023	6/1/2015	102.30678	101.4105669	100.5300686	99.66487473	98.8145884	97.97882635	97.15721837	96.34940676	95.55504575
160210A00036	2/10/2016	1.77	2/10/2023	2/10/2016	100.39394	100.1114219	99.83049646	99.55115488	99.2733837	98.99716963	98.72249953	98.44936041	98.17773944
180709A00081	7/9/2018	3.05	7/7/2023	7/9/2018	101.44418	100.7587166	100.0825139	99.41538388	98.75714469	98.10761932	97.46663542	96.83402519	96.20962519
160222A00018	2/22/2016	2.59	2/23/2026	2/22/2016	105.93766	102.6476401	99.47751538	96.42229113	93.47720364	90.63771266	87.89948961	85.2584065	82.71052554
160222A00019	2/22/2016	3.09	2/21/2031	2/22/2016	117.44086	109.0818521	101.3956918	94.32439538	87.81526187	81.82036846	76.29611489	71.20281323	66.50431852
190829A00073	8/29/2019	1.81	3/15/2023	8/29/2019	100.44213	100.0693249	99.699296	99.33200951	98.9674349	98.60554209	98.24630149	97.88968391	97.53566061
180131A00022	1/31/2018	2.96	1/30/2025	1/31/2018	104.61439	102.3808898	100.2061556	98.08820231	96.0251336	94.01513298	92.05645972	90.14744501	88.28648822
171222A00037	12/22/2017	2.71	12/29/2023	12/22/2017	101.92954	100.7739436	99.64449754	98.54032478	97.46058403	96.40447096	95.37121623	94.36008357	93.37036805
160210A00021	2/10/2016	1.97	2/10/2023	2/10/2016	100.42263	100.1403639	99.8596862	99.58058728	99.30305382	99.02707262	98.75263064	98.47971498	98.20831289
160209A00049	2/9/2016	1.92	2/9/2023	2/9/2016	100.40333	100.1238698	99.8459745	99.56962638	99.29481252	99.02152015	98.74973661	98.4794494	98.21064613
180912A00017	9/12/2018	3.13	9/12/2023	9/12/2018	101.82337	100.9562863	100.1039671	99.26603851	98.44213794	97.63191498	96.83503079	96.05115766	95.27997854
181203A00039	12/3/2018	3.27	12/1/2023	12/3/2018	102.40415	101.3203048	100.2594005	99.22071111	98.20354413	97.20723541	96.23114791	95.27467033	94.33721577
160714A00024	9/20/2016	2.5	9/20/2028	9/20/2016	110.59335	104.7327707	99.22272166	94.04042876	89.16470678	84.57584278	80.25548679	76.18655102	72.35311711
180518A00042	5/25/2018	3.42	5/19/2025	5/25/2018	106.47278	103.920881	101.4437535	99.03876346	96.70338431	94.43519449	92.23187232	90.09119115	88.01101485
190815A00041	8/15/2019	1.86	8/15/2024	8/15/2019	101.58092	99.82191562	98.10160347	96.41884493	94.77254822	93.16166254	91.58517622	90.04211482	88.53153947
181001A00031	10/1/2018	3.23	9/29/2023	10/1/2018	102.00168	101.0882261	100.1911245	99.30993656	98.44424158	97.59363349	96.75772036	95.93612369	95.12847792
190327A00027	3/27/2019	2.66	1/15/2025	3/27/2019	103.85929	101.6735659	99.5445746	97.47043286	95.44933679	93.47955716	91.5594355	89.68738062	87.8618652
161118A00026	12/20/2016	3.03	12/21/2026	12/20/2016	109.69863	105.5419004	101.5676439	97.76684564	94.13098841	90.65202182	87.32233374	84.13472384	81.08237891
180518A00048	5/25/2018	3.65	5/18/2028	5/25/2018	116.4607	110.7646269	105.3893037	100.3149104	95.52295444	90.99617556	86.71845721	82.67474449	78.85097086
171110A00007	11/10/2017	2.38	11/10/2022	11/10/2017	100.06878	100.0410163	100.0132827	99.98557918	99.95790573	99.9302623	99.90264882	99.87506525	99.84751154
170327A00080	3/27/2019	3.43	3/27/2029	3/27/2019	117.10502	110.5546008	104.4226681	98.68020513	93.30035171	88.25823337	83.53080476	79.09670647	74.93613365
171228A00024	12/28/2017	2.71	6/28/2024	12/28/2017	102.85711	101.2119991	99.6009861	98.02307252	96.4773009	94.96275072	93.47853663	92.02380669	90.59774084

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160211A00036	2/11/2016	2.41	2/11/2026	2/11/2016	105.26331	102.0189594	98.89181673	95.87698147	92.96979145	90.16580672	87.46079752	84.85073291	82.33177009
180316A00031	3/16/2018	2.96	12/16/2022	3/16/2018	100.3612	100.233513	100.1061668	99.9791591	99.85248844	99.72615347	99.60015282	99.47448515	99.34914909
181029A00051	2/5/2019	3.69	2/5/2029	2/5/2019	118.43224	111.977326	105.9258014	100.2501765	94.92498572	89.92662363	85.23319915	80.82440205	76.68138051
190726A00014	7/26/2019	2.23	7/24/2024	7/26/2019	102.15152	100.4447056	98.77438402	97.13945201	95.53884848	93.97155516	92.43659437	90.9330269	89.45995017
161017A00007	10/17/2016	1.99	10/18/2023	10/17/2016	100.90185	99.94334997	99.00300159	98.08029414	97.17473462	96.28584826	95.41317769	94.55628213	93.71473665
190621A00039	6/21/2019	2.21	6/17/2024	6/21/2019	101.95751	100.3501943	98.77580523	97.23339865	95.72206344	94.24092299	92.78913358	91.36588273	89.97038784
190422A00030	4/22/2019	2.93	12/22/2025	4/22/2019	106.60837	103.4781361	100.4567265	97.53972455	94.72291917	92.00229595	89.3740267	86.83445954	84.38010952
170327A00079	3/27/2019	3.19	3/29/2027	3/27/2019	111.15331	106.7007067	102.4544573	98.40392142	94.53906398	90.85041551	87.32903724	83.96648872	80.75479748
181016A00019	10/18/2018	3.32	10/16/2023	10/18/2018	102.18441	101.2245405	100.2827119	99.35841895	98.45117487	97.5605106	96.68597419	95.82713002	94.98355803
190917A00033	1/10/2020	2.03	1/10/2023	1/10/2020	100.34005	100.1433172	99.94736444	99.75218897	99.5577861	99.3641512	99.17127967	98.97916697	98.78780857
160729A00017	7/31/2017	2.47	7/31/2029	7/31/2017	111.36386	104.6714823	98.43032571	92.60752639	87.17278201	82.09814213	77.35781321	72.92798099	68.78664838
170918A00051	12/18/2017	2.24	12/19/2022	12/18/2017	100.28381	100.1479156	100.0124022	99.87726921	99.74251508	99.60813816	99.47413683	99.3405095	99.20725457
180201A00022	2/1/2018	2.99	2/3/2025	2/1/2018	104.70932	102.4633977	100.2768186	98.14758894	96.07379885	94.05361813	92.08529225	90.16713847	88.29754225
180518A00071	5/25/2018	3.56	5/18/2026	5/25/2018	109.89955	106.3183001	102.8748627	99.56317625	96.37747917	93.31229462	90.36241476	87.52288601	84.78899503
170327A00078	3/27/2019	3.04	3/27/2026	3/27/2019	107.66504	104.261493	100.9846587	97.82915905	94.78987172	91.86191781	89.04064893	86.3216351	83.70065326
190530A00049	5/30/2019	2.44	5/30/2023	5/30/2019	100.91584	100.3349305	99.76068744	99.1930006	98.63175828	98.07685127	97.52817284	96.98561862	96.44908659
180403A00024	4/3/2018	2.96	4/3/2023	4/3/2018	100.96323	100.5372148	100.1147942	99.69591889	99.28054451	98.86862725	98.46012407	98.05499268	97.65319145
180515A00022	5/15/2018	3.19	5/15/2023	5/15/2018	101.27827	100.7368839	100.2012926	99.6714021	99.14712149	98.62836189	98.11503624	97.60705933	97.10434771
190829A00028	8/29/2019	1.78	8/29/2024	8/29/2019	101.48063	99.68613317	97.93181974	96.21655309	94.53923648	92.89881105	91.29425427	89.72457842	88.18882916
190917A00030	1/10/2020	2.03	1/10/2023	1/10/2020	100.34005	100.1433172	99.94736444	99.75218897	99.5577861	99.3641512	99.17127967	98.97916697	98.78780857
180328A00015	3/28/2018	2.93	3/28/2023	3/28/2018	100.92285	100.513341	100.1071549	99.70424796	99.30458049	98.90811357	98.51480889	98.12462875	97.73753602
190621A00034	6/21/2019	2.17	6/15/2023	6/21/2019	100.79101	100.1673062	99.5513099	98.94288067	98.3418796	97.74817114	97.16162302	96.58210617	96.00949458
190520A00048	5/20/2019	2.53	5/20/2024	5/20/2019	102.35499	100.8190763	99.31372202	97.83808861	96.39136355	94.97276358	93.58153336	92.21694419	90.87829288
191002A00042	1/13/2020	1.76	1/13/2023	1/13/2020	100.29459	100.0896513	99.8855593	99.68231155	99.47990271	99.27832756	99.07758089	98.87765755	98.67855242
190426A00023	4/26/2019	2.91	6/24/2026	4/26/2019	107.87653	104.2319248	100.7310948	97.36755796	94.13516466	91.02807767	88.04075424	85.16792931	82.4045999
180727A00017	7/27/2018	3.16	7/27/2023	7/27/2018	101.61858	100.8785241	100.1492398	99.43049381	98.72205884	98.02371409	97.33524503	96.65644316	95.98710584
180312A00014	3/12/2018	3	3/13/2023	3/12/2018	100.87814	100.5098111	100.1441833	99.7812238	99.42090338	99.06319321	98.70806489	98.35549042	98.00544224
200131A00029	1/31/2020	1.78	10/31/2024	1/31/2020	101.6766	99.71523552	97.80156651	95.93413572	94.11154225	92.33243737	90.59552213	88.8995452	87.24330078
150601A00677	6/1/2015	2.39	1/30/2025	6/1/2015	103.53985	101.3128604	99.14464114	97.03320337	94.97664664	92.97315075	91.02097157	89.11843713	87.26394397
160211A00034	2/11/2016	1.82	2/10/2023	2/11/2016	100.38016	100.0979687	99.81736974	99.53834923	99.26089383	98.98499035	98.71062577	98.43778717	98.16646182
160714A00018	9/6/2016	2.28	9/4/2026	9/6/2016	105.9888	102.1911542	98.55063769	95.05995674	91.71219456	88.50078835	85.41950946	82.46244466	79.62397856
170609A00052	6/11/2018	2.9	6/9/2027	6/11/2018	110.33217	105.7073786	101.3054034	97.11430948	93.12286487	89.32049662	85.6972486	82.24374195	78.95113852
160222A00005	2/22/2016	2.79	2/22/2028	2/22/2016	111.30785	105.9771217	100.9370391	96.1702402	91.66048528	87.39258125	83.35230888	79.52635548	75.90225258

	Parallel-Shift Sensitivity Analysis												
10/31/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180625A00012	6/25/2018	3.07	6/23/2023	6/25/2018	101.39344	100.7459661	100.1067546	99.47565149	98.85250308	98.23715955	97.62947483	97.02930647	96.43651554
160303A00020	3/3/2016	2.97	3/3/2031	3/3/2016	117.70587	109.2539577	101.486506	94.34423825	87.77330267	81.72474923	76.15406079	71.02073128	66.28788583
190621A00037	6/21/2019	2.21	5/15/2024	6/21/2019	101.82037	100.3021541	98.81401287	97.35512681	95.92470213	94.52197335	93.14620203	91.79667556	90.47270604
130211A00026	2/11/2013	2.27	2/15/2023	2/11/2013	100.52437	100.2281612	99.93370886	99.64099297	99.34999809	99.06070904	98.77311078	98.48718849	98.20292747
141117A00011	11/17/2014	3.81	11/17/2034	11/17/2014	129.38968	117.1090055	106.1783144	96.43947757	87.75374982	79.99929892	73.06906246	66.86888588	61.31590363
190826A00046	8/26/2019	1.77	8/26/2024	8/26/2019	101.45298	99.66653992	97.91995635	96.21208935	94.54184366	92.90816253	91.31002614	89.74644999	88.21648344
180123A00067	1/23/2018	2.67	1/23/2023	1/23/2018	100.53276	100.2998757	100.0680787	99.83736064	99.607714	99.37913132	99.15160517	98.92512823	98.69969323
191002A00045	2/14/2020	1.75	2/14/2023	2/14/2020	100.368	100.0748422	99.78340496	99.49367114	99.20562579	98.91925413	98.63454154	98.35147359	98.07003601
170327A00077	3/27/2019	2.74	3/27/2024	3/27/2019	102.41232	101.0196829	99.65265408	98.3105867	96.99285683	95.6988609	94.42801486	93.17975334	91.95352897
190325A00022	3/25/2019	2.55	11/25/2022	3/25/2019	100.18166	100.1122789	100.0429971	99.97381901	99.90474446	99.8357732	99.766905	99.69813965	99.62947692
181031A00070	3/1/2019	3.77	3/1/2029	3/1/2019	119.10125	112.5563503	106.4243115	100.676828	95.28767556	90.23254755	85.48890586	81.03584376	76.85396011
160524A00015	11/25/2016	2.71	11/25/2026	11/25/2016	108.20112	104.1435872	100.2620731	96.5479944	92.9932348	89.59011628	86.33137259	83.21012497	80.21985919
190805A00031	8/5/2020	1.77	8/4/2023	8/5/2020	100.59266	99.83540392	99.08950896	98.3547212	97.630794	96.91748796	96.2145707	95.52181656	94.83900638
150601A00998	6/1/2015	5.37	10/25/2034	6/1/2015	146.27723	133.0972675	121.3309397	110.8152288	101.406867	92.97984746	85.42325712	78.63939241	72.54211846
180104A00016	1/4/2018	2.56	1/4/2023	1/4/2018	100.41568	100.2354019	100.0557737	99.87679264	99.69845532	99.5207582	99.34369785	99.16727084	98.99147376
160307A00029	3/7/2016	3.21	3/7/2031	3/7/2016	118.46391	110.0274277	102.2720231	95.13881873	88.57431857	82.52988943	76.9612966	71.82828568	67.09420602
081028A00036	10/30/2008	4.22	10/30/2023		103.16239	102.1600056	101.1771353	100.2132187	99.26771069	98.34008709	97.42984811	96.53651166	95.6596066
180406A00015	4/10/2018	2.61	4/10/2028	4/10/2023	112.78837	107.6509681	103.4543487	100.5869338	99.23366174	98.68512024	98.25661791	97.83418662	97.41540686
180925A00059	9/25/2018	3.01	9/25/2028	9/25/2023	116.00654	110.2523527	105.3586565	101.5385991	99.00200309	97.5886639	96.68192304	95.86657028	95.06692662
190522A00029	5/22/2019	2.41	5/22/2024	5/22/2023	102.38754	101.0156999	99.95629708	99.22370164	98.65460463	98.11868389	97.58985258	97.06671994	96.5491988
190523A00048	5/23/2019	2.32	5/23/2024	5/23/2023	102.26282	100.9065543	99.87466241	99.16197498	98.59692519	98.05911405	97.52799782	97.00262898	96.48292094
190613A00024	6/13/2019	2.18	6/13/2024	6/13/2023	102.17037	100.7771998	99.71258452	98.95388762	98.33621009	97.74692149	97.16557005	96.59111469	96.02345387
191121A00031	11/21/2019	1.54	11/21/2024	11/21/2022	102.14244	100.63262	100.0053939	99.92099679	99.8629838	99.80505143	99.74719928	99.6894273	99.63173543
191209A00045	12/9/2019	1.56	12/9/2024	12/9/2022	102.26244	100.7197426	100.0043529	99.84028966	99.73281112	99.62579265	99.51886088	99.41218633	99.30575131
191211A00013	12/11/2019	1.57	12/11/2024	12/12/2022	102.26812	100.7182846	99.99946138	99.82768742	99.71200793	99.59679768	99.48173393	99.36696394	99.25247207
200131A00023	1/31/2020	1.56	1/31/2025	1/31/2023	102.19775	100.6022043	99.82861067	99.52602051	99.2750098	99.02563003	98.77749558	98.5305977	98.28492712
200207A00008	2/7/2020	1.35	2/7/2025	2/7/2023	102.10852	100.5418039	99.7731432	99.44535092	99.17496349	98.90706375	98.64054134	98.37540395	98.11171966
200221A00041	2/21/2020	1.53	2/21/2025	2/21/2023	102.22503	100.5858265	99.74188387	99.36788469	99.0603625	98.75599	98.45346319	98.15277278	97.85392809
200227A00025	2/27/2020	1.09	2/27/2025	2/27/2023	101.66827	100.2161368	99.57356176	99.22730491	98.90474227	98.5843688	98.26606066	97.94979939	97.63556897
200303A00035	3/3/2020	0.81	3/3/2025	3/3/2023	101.2468	99.98421541	99.43445114	99.08872574	98.75615317	98.4258585	98.09764703	97.77160325	97.44774338