

## Implementation of Price Methodology Change for FTSE Mortgage Index

As previously announced, on April 15, 2019, FTSE Russell implemented a change to the pricing methodology for the FTSE Mortgage Index after completing a comprehensive review of various alternative approaches and sources, including both qualitative and quantitative assessments<sup>1</sup>. This announcement provides further details on the impact of the methodology change based on April 2019 prices and returns.

### Overview of Pricing Methodology for Mortgage Index Cohorts

The FTSE Mortgage Index tracks 15-year and 30-year pass-through mortgage backed securities (MBS) guaranteed by Freddie Mac, Fannie Mae and Ginnie Mae. The index is represented by origination year “cohorts” which are constructed by grouping together thousands of individual settled MBS pass-through pools by agency, term, coupon and loan age. As of April 2019, 263 cohorts are used to represent ~\$5.5 trillion in current balance comprised of roughly 450,000 individual pools. Cohorts tracked by the FTSE Mortgage Index are assigned an index price which is used to represent thousands of underlying settled MBS. Prior to April 15, 2019, the pricing methodology<sup>2</sup> for mortgage cohorts applied a Citi trader assigned pay-up based on vintage only to the associated TBA price, and then discounted the price back to same day settlement. Prices were taken on the bid-side and represented a 3:00 p.m. NY snap time.

Effective April 15, 2019, the pricing methodology for the mortgage index cohorts was changed to use same day settlement prices sourced from Refinitiv for all the pools that underlie a given MBS cohort. Under the new methodology, these pool prices are averaged based on each pool’s current amount outstanding to arrive at an index price. The price for all the pools that underlie a given cohort, including both specified and non-specified pools, are included in the average. The amount outstanding which determines how much each pool contributes to the index price is updated on the same cycle as the index factor updates. Prices continue to represent a 3:00 p.m. (NY snap time) bid-side valuation.

The change in pricing methodology incorporates additional granularity to the measurement of performance with a price that incorporates the valuation of all securities that underlie mortgage cohorts. We expect this methodology to facilitate a more representative approach to valuation through the ongoing structural evolution of the US agency mortgage market. FTSE Russell is consulting with users on ways to provide additional transparency into the pool composition for cohorts.

In the Yield Book platform, the cohort prices that users see represent the new pricing methodology, effective from April 15, 2019. Users of the Yield Book platform will continue to have access to TBA prices sourced from the Citi trading desk; however, these TBA levels no longer directly underpin mortgage cohort prices.

Index cohort-level analytics, such as duration, will continue to be calculated based on the average characteristics of all of the pools underlying a given cohort at the “repline level”; they are not calculated as an average of analytics calculated for each underlying pool. We intend to consider with users whether evolution of this approach should be considered in the future.

### Example of Old vs New Methodology for Sample Cohorts

Under the old pricing methodology which utilized a TBA plus pay-up approach, a hypothetical security is priced based on program, coupon and vintage, rather than individual traded mortgage pools. The incorporation of

<sup>1</sup> For further details, please see the following notice: [http://yieldbook.com/f/m/pdf/ftse\\_indexes/announcements/IX2\\_20190117.pdf](http://yieldbook.com/f/m/pdf/ftse_indexes/announcements/IX2_20190117.pdf).

<sup>2</sup> The inputs were provided by Citigroup Global Markets Inc. (“Citi”).

variability of all underlying mortgage pool prices under the new methodology results in expected differences. Figure 1 provides examples of the differences for a select group of cohorts in the index as of April 12, 2019 to illustrate the differences.

**Figure 1. Example of Cohort Level Price Differences Under Old and New Pricing Methodology**

Cohort	Current Balance (\$ billion)	Market Weight (%)	Cohort Price		# of Pools Contributing To New Price	Standard Deviation*
			Old Methodology	New Methodology		
FNM30.300.16	195.82	3.49	98.91	98.99	4574	0.21
G230.350.17	169.31	3.11	101.85	101.81	13	0.20
G230.300.16	158.36	2.85	100.03	100.11	11	0.08
FNM30.350.17	157.17	2.86	100.93	100.99	5032	0.25
FHL30.300.16	149.18	2.66	98.93	99.05	1827	0.20
FNM30.400.18	182.76	3.38	102.72	102.67	4567	0.34
FNM30.350.15	127.85	2.33	101.39	101.15	7348	0.35
FHL30.350.17	120.47	2.19	100.96	101.11	2583	0.24
FNM30.400.17	116.33	2.15	102.69	103.04	5646	0.50
FHL30.300.13	65.49	1.17	99.27	99.61	1982	0.24

\*The standard deviation of pool prices and the number of pools contributing to a cohort price under the new methodology is meant to show the variability of pool prices underlying each respective cohort. Where standard deviations are larger, it could be expected that the divergence between the cohort price produced under the new and old methodology is larger. Source: FTSE Russell. Data are as of April 12, 2019.

**Mortgage Index Month-to-Date Return as of April 12, 2019**

Figure 2 provides a comparison of month-to-date returns as of April 12, 2019, which precedes implementation of the price change on April 15, 2019. The published returns in the left-hand columns reflect beginning and ending prices using the old pricing methodology. The right-hand columns reproduce month-to-date returns as of April 12, 2019 using ending prices under the new methodology. This comparison is intended to capture the difference in month-to-date returns that can be attributed to the change in pricing methodology as of a given date during the month of implementation.

**Figure 2. FTSE Mortgage Index Month-to-Date Returns through April 12, 2019, Prior to Implementation of the Mortgage Pricing Methodology Change on April 15, 2019**

Index	# of Cohort	Published Data using Beginning and Ending Prices under Old Methodology as of April 12					Index Returns calculated using Beginning Price under Old Methodology and Ending Prices Based on New Methodology		
		Market Value*	Market Weight (%)	Total Return	Price Return	Other Return	Total Return	Price Return	Other Return
<b>Mortgage Index</b>	<b>263</b>	<b>5557.98</b>	<b>100.00</b>	<b>-0.287</b>	<b>-0.393</b>	<b>0.107</b>	<b>-0.134</b>	<b>-0.240</b>	<b>0.107</b>
<b>30-Year Fannie Mae</b>	<b>71</b>	<b>2073.65</b>	<b>37.31</b>	<b>-0.283</b>	<b>-0.393</b>	<b>0.110</b>	<b>-0.151</b>	<b>-0.260</b>	<b>0.110</b>
2.50%	3	11.08	0.20	-0.506	-0.583	0.078	0.046	-0.031	0.078
3.00%	7	453.02	8.17	-0.513	-0.603	0.091	-0.378	-0.468	0.091
3.50%	10	650.12	11.70	-0.345	-0.448	0.104	-0.388	-0.491	0.104
4.00%	11	590.53	10.62	-0.184	-0.300	0.117	-0.093	-0.209	0.117
4.50%	12	239.31	4.30	-0.091	-0.220	0.129	0.233	0.105	0.129
5.00%+	28	129.60	2.33	0.123	-0.176	0.301	1.712	1.412	0.301

Figure 2. FTSE Mortgage Index Month-to-Date Returns through April 12, 2019, Prior to Implementation of the Mortgage Pricing Methodology Change on April 15, 2019 (cont'd)

Index	# of Cohort	Published Data using Beginning and Ending Prices under Old Methodology as of April 12					Index Returns calculated using Beginning Price under Old Methodology and Ending Prices Based on New Methodology		
		Market Value*	Market Weight (%)	Total Return	Price Return	Other Return	Total Return	Price Return	Other Return
<b>30-Year Freddie Mac</b>	<b>59</b>	<b>1354.11</b>	<b>24.37</b>	<b>-0.307</b>	<b>-0.417</b>	<b>0.109</b>	<b>-0.047</b>	<b>-0.156</b>	<b>0.109</b>
2.50%	1	3.38	0.06	-0.449	-0.527	0.078	-0.644	-0.722	0.078
3.00%	7	313.72	5.66	-0.527	-0.618	0.091	-0.292	-0.382	0.091
3.50%	10	444.00	7.99	-0.355	-0.459	0.104	-0.186	-0.290	0.104
4.00%	11	360.03	6.47	-0.194	-0.310	0.117	-0.019	-0.136	0.117
4.50%	10	155.56	2.80	-0.121	-0.250	0.129	0.249	0.120	0.129
5.00%+	20	77.43	1.39	0.025	-0.275	0.300	2.134	1.835	0.300
<b>30-Year Ginnie Mae 2</b>	<b>73</b>	<b>1560.60</b>	<b>28.07</b>	<b>-0.262</b>	<b>-0.369</b>	<b>0.108</b>	<b>-0.196</b>	<b>-0.303</b>	<b>0.108</b>
2.50%	2	11.40	0.21	-0.454	-0.530	0.077	-0.614	-0.690	0.077
3.00%	10	390.16	7.03	-0.419	-0.508	0.090	-0.356	-0.445	0.090
3.50%	13	577.57	10.39	-0.315	-0.417	0.103	-0.264	-0.366	0.103
4.00%	16	330.47	5.94	-0.150	-0.266	0.116	-0.064	-0.179	0.116
4.50%	14	173.01	3.11	-0.055	-0.183	0.129	0.167	0.039	0.129
5.00%+	18	77.99	1.40	0.188	-0.111	0.302	-0.124	-0.424	0.302
<b>30-Year Ginnie Mae 1</b>	<b>25</b>	<b>111.18</b>	<b>2.00</b>	<b>-0.167</b>	<b>-0.285</b>	<b>0.118</b>	<b>0.137</b>	<b>0.019</b>	<b>0.118</b>
<b>15-Year Freddie Mac</b>	<b>28</b>	<b>228.41</b>	<b>4.11</b>	<b>-0.338</b>	<b>-0.424</b>	<b>0.085</b>	<b>-0.033</b>	<b>-0.118</b>	<b>0.085</b>
<b>15-Year Fannie Mae</b>	<b>32</b>	<b>341.21</b>	<b>6.14</b>	<b>-0.305</b>	<b>-0.390</b>	<b>0.087</b>	<b>-0.156</b>	<b>-0.241</b>	<b>0.087</b>

\*In USD billions. Source: FTSE Russell. Data are as of April 12, 2019.

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