

CRTx®

Credit Risk Transfer Return Tracking Index

www.markfontanilla.com/crtx-index

8/30/2019 Index Rebalancing Update

Highlights

The CRTx® Aggregate

Aug 2019 CRTx® Agg Tot. Return	-22 bps
Price Attribution	-64 bps
Paydown Attribution	-3 bps
Cpn Accr&Pmt Attribution	+45 bps

➤ Amid the highest market volatility so far this year, the CRTx® Aggregate posted a -0.22% decline in August as spreads widened and seasoned paper once again lagged. 2015/2016 LMEZZ deal vintages, and now the 2017 vintage, came under more pressure last month as paydowns remain elevated. Balancing out the CRT complex, 2018/2019 deals continued to outperform, returning 41bps overall in August, while B-pieces in aggregate came in with a solid 73bps return as SUB spreads held in relatively well. Equities were down for the month, while the major fixed income sector indexes benefited heavily from another 40-50bp rally in the curve, especially the longer duration IG segment which continues to be the leading bond sector for the year. While CRT has understandably lagged into the rate rally, excess return volatility is still better contained relative to other major market sectors.

➤ The CRTx® Aggregate market value was down slightly month over month to \$53.2 billion as of August's month-end rebalancing. B-piece share of the CRT complex increased to 16.8% of the CRTx® Aggregate as issuance and market value technicals have been supportive. Three classes from the new CAS 2019-R05 deal entered the September Index basket, bringing the CRTx® Aggregate up to 219 constituents across 76 deals.

➤ Closer-to-par, recent issues with stable credit fundamentals and less negative convexity should continue see better relative value performance vs. more seasoned deals greater than 24 months old. High premium 2014-2017 LMEZZ, which represent about 47% of the Aggregate, still weigh on the CRT sector and have posted negative returns for Q3 so far, but have appeared to stabilize for now.

CRTx® Rebalancing For Sep 2019

As of 8/30/2019

September 2019 Aggregate Constituency (w/MoM Δ):

• Beg. UPB (\$B):	\$50.67	+0.4%
• Beg. Market Value (\$B):	\$53.22	-0.3%
• Constituents:	219	+3
• WAvg Constituent Value:	105.03	-0.74 pts
• WAvg Constituent Coupon:	5.63%	-13 bps

Index Entries*

+ CAS 2019-R05 1M1/1M2/1B1

Index Exits

- None

* These entrants comprise 1.89% of September's Aggregate Beginning Market Value

CRTx® Breakdown For 9/2019

Deal Vintage	Aggregate	UMEZZ	LMEZZ	SUB
All	100%	14.4%	68.8%	16.8%
2019	15.6%	3.2%	8.4%	3.9%
2018	21.7%	3.9%	13.4%	4.4%
2017	22.9%	3.7%	14.8%	4.4%
2016	17.2%	1.7%	13.2%	2.2%
2015	11.2%	1.1%	8.3%	1.7%
<=2014	11.4%	0.8%	10.6%	0.0%

8/30/2019 Index Rebalancing Update (continued)

CRTx® RNI™ Rebalancing For Sep 2019

As of 8/30/2019

September 2019 Aggregate Constituency (w/MoM Δ):

• Beg. UPB (\$B):	\$11.56	-0.8%
• Beg. Market Value (\$B):	\$11.87	-0.8%
• Constituents:	52	+0
• WAvg Constituent Value:	102.69	-0.02 pts
• WAvg Constituent Coupon:	4.99%	-11 bps

Index Entries*

+ CAS 2019-R05 1M1/1M2/1B1

Index Exits

- CAS 2018-C05 1M1/1M2/1B1

* These entrants comprise 8.49% of September's Aggregate Beginning Market Value

Deal Vintage	CRTx® RNI™ Breakdown For 9/2019			
	Aggregate	UMEZZ	LMEZZ	SUB
All	100%	19.6%	55.2%	25.2%
2019	69.8%	14.5%	37.7%	17.6%
2018	30.2%	5.1%	17.5%	7.6%
2017	0.0%	0.0%	0.0%	0.0%
2016	0.0%	0.0%	0.0%	0.0%
2015	0.0%	0.0%	0.0%	0.0%
<=2014	0.0%	0.0%	0.0%	0.0%

Highlights (continued)

RNI™ (Rolling New Issues – 12mth Lookback)

Aug 2019 CRTx® RNI™ Tot. Return	+49 bps
Price Attribution	+8 bps
Paydown Attribution	+0 bps
Cpn Accr&Pmt Attribution	+41 bps

- The CRTx® RNI™ was positive 49bps in August, outperforming the broad market CRTx® Aggregate by 71bps. The RNI™'s rolling basket continues to perform well, despite lagging the broader fixed income markets last month. YTD the RNI™ CRT basket is up 8.86%, putting it ahead of the broad market aggregates, which have returned just under 8.00% for the year, but still trails behind IG and HY, which are up ~11-13% for 2019. Despite August being the highest excess return volatility month of the year for nearly all major market sectors, 2018/2019 CRT issues overall have seen month-over-month volatility relatively more subdued, especially versus the rest of the CRT complex, with 2018/2019 UMEZZ and SUB volatility slightly lower, while 2018/2019 LMEZZ volatility was higher in August.
- The CRTx® RNI™ market value is down slightly with the September basket to \$11.87 billion as 3 classes “rolled off” while 3 new classes from the latest CAS deal “rolled on” to the August RNI™ basket. The Index constituency stayed at 52 securities from 15 deals with a weighted average class market value of 102.69, little changed from the prior month.
- RNI™ returns for August were largely at carry as UMEZZ and LMEZZ market values were slightly lower, but SUBs were modestly net higher. YTD, the RNI™ and the UMEZZ, LMEZZ, and SUB components have returned 8.86%, 2.42%, 7.35%, and 19.77%, respectively. The rolling RNI™ basket and its Sub-Indexes have continued to outpace the broad-sector holding basket of the CRT® Aggregate and its related Sub-Indexes since market inception, and are expected to continue to do so over the near term.

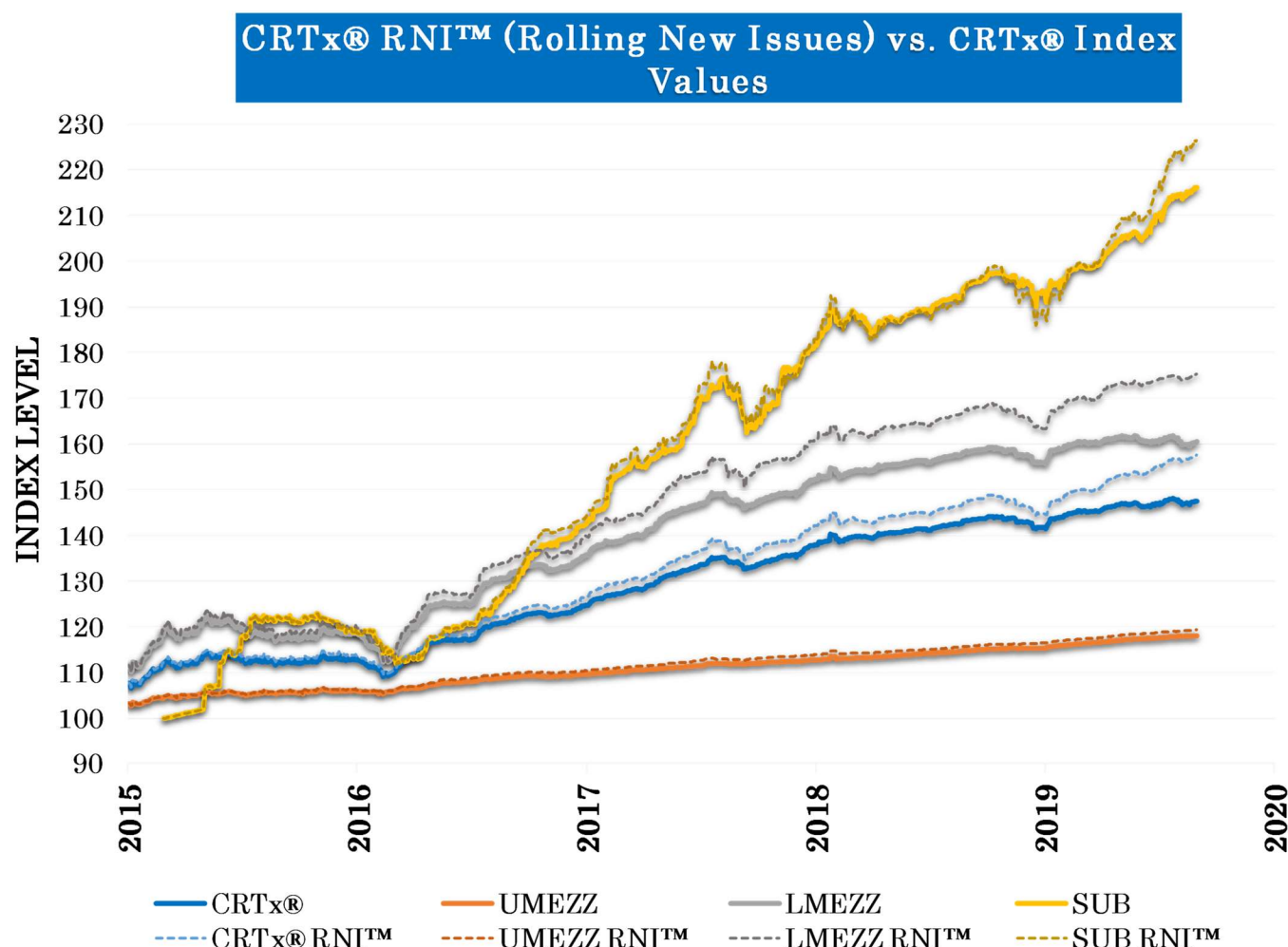
CRTx® Index Suite Total Return Performance (as of Month End 8/30/2019)

CRTx® (Credit Risk Transfer Return Tracking Index) Return Summary										
		RETURNS								
		Period					Annualized			
		Daily	Wkly	Mthly	MTD	QTD	YTD	1-YR	3-YR	As of Date
Aggregate		0.02%	0.16%	-0.23%	-0.22%	0.42%	4.07%	2.92%	6.78%	8/30/19
	Upper Mezzanine	0.01%	0.04%	0.14%	0.14%	0.42%	2.38%	2.90%	2.73%	8/30/19
	Lower Mezzanine	0.02%	0.15%	-0.54%	-0.53%	-0.14%	2.89%	1.27%	6.97%	8/30/19
	Subordinate	0.03%	0.31%	0.74%	0.73%	2.87%	11.71%	10.76%	19.09%	8/30/19
	Upper/Lower Mezz.	0.02%	0.13%	-0.42%	-0.41%	-0.04%	2.76%	1.59%	5.60%	8/30/19
	Lower Mezz./Sub.	0.03%	0.18%	-0.30%	-0.29%	0.42%	4.44%	2.91%	8.41%	8/30/19
	CAS	0.01%	0.13%	-0.27%	-0.26%	0.29%	4.01%	2.78%	6.91%	8/30/19
	STACR	0.03%	0.20%	-0.17%	-0.18%	0.57%	4.13%	3.09%	6.65%	8/30/19
	LLTV	0.01%	0.11%	-0.29%	-0.28%	0.33%	3.91%	2.71%	6.70%	8/30/19
	HLTV	0.05%	0.23%	-0.13%	-0.13%	0.56%	4.35%	3.31%	6.92%	8/30/19
Upper Mezzanine	2019	0.01%	0.06%	0.20%	0.19%	0.51%	2.00%	-	-	8/30/19
	2018	0.01%	0.06%	0.20%	0.20%	0.48%	2.41%	3.08%	-	8/30/19
	2017	0.01%	0.03%	0.14%	0.14%	0.42%	2.29%	2.92%	-	8/30/19
	2016	0.02%	0.05%	0.14%	0.14%	0.39%	2.28%	2.76%	2.67%	8/30/19
	2015	0.01%	-0.08%	-0.07%	-0.07%	0.24%	2.28%	2.48%	2.65%	8/30/19
	<=2014	0.02%	0.02%	-0.03%	-0.03%	0.25%	2.57%	2.55%	2.54%	8/30/19
Lower Mezzanine	2019	0.05%	0.26%	0.20%	0.24%	0.59%	4.70%	-	-	8/30/19
	2018	0.04%	0.20%	0.32%	0.33%	0.84%	7.28%	4.38%	-	8/30/19
	2017	-0.05%	0.09%	-0.52%	-0.51%	-0.19%	3.62%	1.66%	-	8/30/19
	2016	-0.01%	0.01%	-1.43%	-1.41%	-1.11%	-0.53%	-1.82%	6.86%	8/30/19
	2015	0.07%	0.32%	-0.97%	-0.98%	-0.59%	0.47%	-0.70%	5.03%	8/30/19
	<=2014	0.09%	0.13%	-0.69%	-0.65%	-0.25%	1.74%	0.97%	6.05%	8/30/19
Subordinate	2019	0.05%	0.56%	1.10%	1.11%	4.83%	17.45%	-	-	8/30/19
	2018	0.02%	0.35%	0.76%	0.73%	3.73%	17.06%	13.43%	-	8/30/19
	2017	0.04%	0.24%	-0.12%	-0.13%	1.58%	8.85%	6.31%	-	8/30/19
	2016	0.03%	0.17%	1.16%	1.13%	1.90%	6.56%	9.99%	20.29%	8/30/19
	2015	0.02%	0.02%	1.66%	1.64%	2.21%	5.48%	8.51%	17.01%	8/30/19
	<=2014									8/30/19

CRTx® RNI™ (Rolling New Issues*) Return Summary										
RETURNS										
		Period					Annualized			
		Daily	Wkly	Mthly	MTD	QTD	YTD	1-YR	3-YR	As of Date
Aggregate		0.04%	0.27%	0.48%	0.49%	1.69%	8.86%	6.67%	8.68%	8/30/19
	Upper Mezzanine	0.01%	0.06%	0.20%	0.19%	0.49%	2.42%	3.10%	2.83%	8/30/19
	Lower Mezzanine	0.05%	0.26%	0.27%	0.30%	0.78%	7.35%	4.52%	9.29%	8/30/19
	Subordinate	0.04%	0.48%	1.17%	1.16%	4.91%	19.77%	15.88%	20.74%	8/30/19
	LLTV	0.03%	0.23%	0.34%	0.35%	1.40%	8.40%	6.03%	8.32%	8/30/19
	HLTV	0.05%	0.34%	0.68%	0.70%	2.12%	9.66%	7.77%	9.24%	8/30/19

* Most recently issued securities within a "rolling" 12-month window

CRTx® / CRTx® RNI™ Historical Index Values Comparison (as of Month End 8/30/2019)

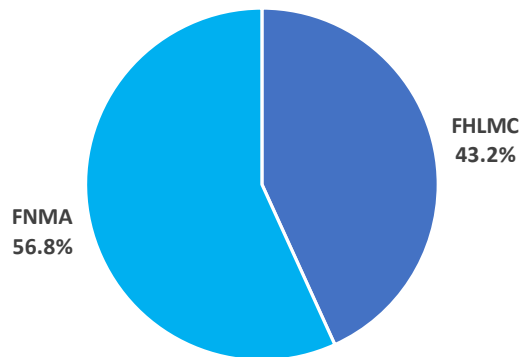


* CRTx® Aggregate Index and Sub Index Constituency

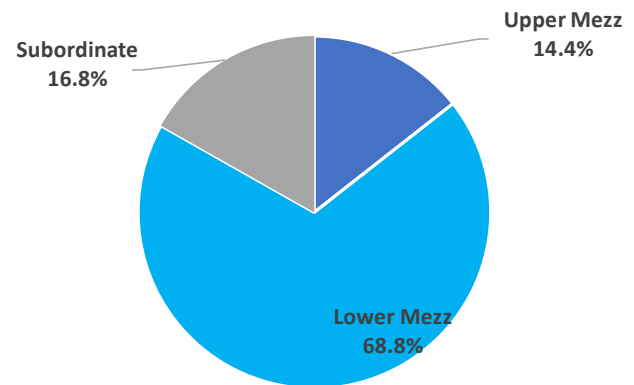
<div>CRTx® Aggregate Index and Sub-Index Constituency</div>					
Aggregate	Upper Mezzanine	Lower Mezzanine	Subordinate	LLTV	HLTV
All Index-Eligible FNMA CAS shelf and FHLMC STACR shelf At-Issuance Classes	<u>FNMA CAS Shelf:</u> M1 Classes	<u>FNMA CAS Shelf:</u> M2 Classes	<u>FNMA CAS Shelf:</u> All B Classes	All Index-Eligible FNMA CAS shelf and FHLMC STACR shelf At-Issuance Classes from deals referencing Low Loan to Value (LLTV) loans	All Index-Eligible FNMA CAS shelf and FHLMC STACR shelf At-Issuance Classes from deals referencing High Loan to Value (HLTV) loans
	<u>FHLMC STACR Shelf:</u> M1 Classes (in M1/M2 structures) M1/M2 Classes (in M1/M2/M3 structures)	<u>FHLMC STACR Shelf:</u> M2 Classes (in M1/M2 structures) M3 Classes (in M1/M2/M3 structures)	<u>FHLMC STACR Shelf:</u> All B Classes		
	Vintage Sub Index constituency determined by deal/security closing year (except 2013/2014 which are grouped as "2014").				
RNI™ (Rolling New Issues) versions of the standard CRTx® Aggregate and Sub-Indexes have dynamic constituent baskets made up exclusively of the most recently issued securities within a "rolling" 12-month look-back window.					

CRTx® Select Constituent Metrics (as of September 2019 Starting Constituency)

Sponsor % of CRTx® Mkt Val For 09/2019



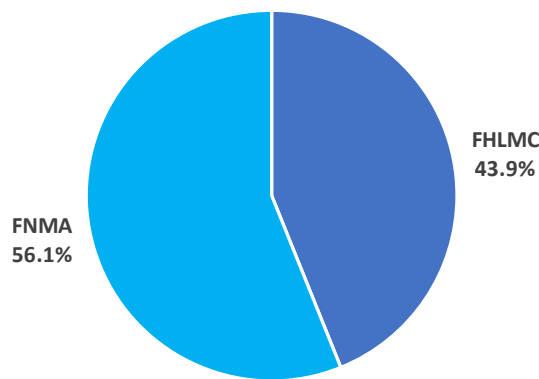
Sub Index % of CRTx® Mkt Val For 09/2019



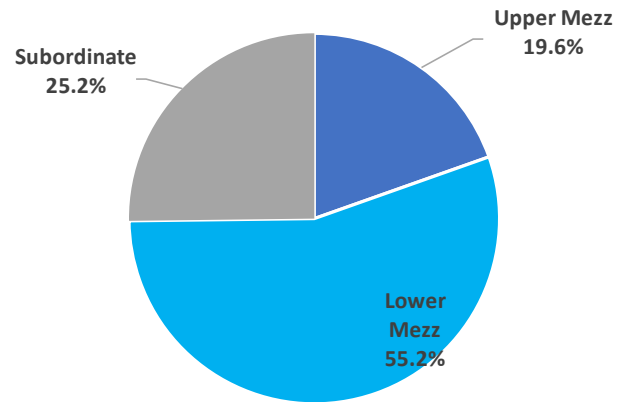
CRTx® Valuation Month	Month End Total Return	Beginning Constituents	Starting UPB	Starting Market Value	Starting Wtd Px + Accr	Starting WAvg Cpn	Starting WAvg Cpn Margin
Sep-2016	1.16%	124	29,552,152,007	30,628,130,025	103.64	4.38	386
Oct-2016	-0.38%	132	30,287,269,424	31,604,398,674	104.35	4.37	384
Nov-2016	0.50%	134	30,141,365,379	31,231,159,519	103.62	4.41	387
Dec-2016	1.39%	134	30,535,737,665	31,677,556,282	103.74	4.49	390
Jan-2017	1.73%	136	30,635,543,863	32,096,125,632	104.77	4.70	395
Feb-2017	0.44%	136	31,409,187,966	33,308,962,720	106.05	4.72	395
Mar-2017	0.69%	144	32,517,186,276	34,429,213,421	105.88	4.71	393
Apr-2017	1.80%	145	33,534,111,196	35,567,760,320	106.06	4.90	392
May-2017	1.18%	148	34,545,143,500	37,102,973,962	107.40	4.89	390
Jun-2017	1.08%	154	36,559,901,193	39,445,598,983	107.89	4.85	383
Jul-2017	1.13%	154	36,960,548,292	40,125,896,076	108.56	5.03	382
Aug-2017	-0.85%	157	37,868,711,578	41,338,889,729	109.16	5.01	377
Sep-2017	-0.26%	161	38,450,544,875	41,413,057,902	107.70	4.99	376
Oct-2017	0.93%	161	37,965,303,718	40,653,923,485	107.08	5.02	378
Nov-2017	0.33%	164	39,280,202,943	42,203,767,792	107.44	4.97	373
Dec-2017	1.96%	168	39,956,637,967	42,844,604,733	107.23	5.03	370
Jan-2018	1.54%	164	39,474,798,661	43,041,080,732	109.03	5.27	372
Feb-2018	-0.26%	167	39,939,512,665	43,994,471,289	110.15	5.25	369
Mar-2018	-0.21%	169	41,017,066,226	44,799,231,631	109.22	5.26	364
Apr-2018	0.85%	173	42,628,557,312	46,147,934,241	108.26	5.46	359
May-2018	0.34%	171	42,241,567,665	45,959,484,313	108.80	5.49	360
Jun-2018	0.10%	174	42,864,967,271	46,548,011,728	108.59	5.53	357
Jul-2018	0.71%	175	43,499,746,985	47,020,352,767	108.09	5.64	355
Aug-2018	0.67%	178	43,951,183,222	47,607,311,601	108.32	5.60	354
Sep-2018	0.49%	181	44,461,531,990	48,228,311,665	108.47	5.59	353
Oct-2018	-0.28%	184	44,818,307,961	48,627,472,412	108.50	5.74	353
Nov-2018	-0.38%	194	46,292,107,661	49,742,058,694	107.45	5.79	351
Dec-2018	-0.79%	196	46,818,174,805	49,837,570,835	106.45	5.82	350
Jan-2019	1.82%	194	46,413,757,739	48,813,599,349	105.17	6.02	351
Feb-2019	0.67%	197	46,772,850,585	49,835,261,884	106.55	6.03	352
Mar-2019	0.02%	203	48,032,924,530	51,194,424,387	106.58	6.00	351
Apr-2019	1.01%	207	49,316,494,813	52,277,031,986	106.00	5.98	349
May-2019	-0.19%	209	49,790,890,759	53,037,404,665	106.52	5.95	348
Jun-2019	0.27%	213	49,953,468,597	52,832,944,573	105.76	5.92	349
Jul-2019	0.64%	209	49,366,797,803	52,159,117,634	105.66	5.91	350
Aug-2019	-0.22%	216	50,468,731,712	53,380,865,643	105.77	5.76	349
Sep-2019		219	50,665,720,868	53,216,607,717	105.03	5.63	349

CRTx® RNI™ Select Constituent Metrics (as of September 2019 Starting Constituency)

Sponsor % of CRTx® RNI™ Mkt Val For 09/2019



Sub Index % of CRTx® RNI™ Mkt Val For 09/2019



CRTx® RNI™ Valuation Month	Month End Total Return	Beginning Constituents	Starting UPB	Starting Market Value	Starting Wtd Px + Accr	Starting WAvg Cpn	Starting WAvg Cpn Margin
Sep-2016	1.27%	56	13,198,577,693	13,786,166,208	104.45	4.89	437
Oct-2016	-0.31%	60	13,594,938,031	14,274,266,773	105.00	4.81	428
Nov-2016	0.33%	60	12,566,169,391	13,072,243,217	104.03	4.74	420
Dec-2016	1.80%	59	12,551,414,958	13,027,812,392	103.80	4.76	418
Jan-2017	1.84%	58	12,640,805,888	13,275,175,101	105.02	4.95	420
Feb-2017	0.54%	57	12,964,446,131	13,718,268,210	105.81	4.89	412
Mar-2017	0.52%	60	13,538,376,545	14,193,918,058	104.84	4.67	389
Apr-2017	1.67%	56	13,408,970,243	13,924,618,857	103.85	4.63	365
May-2017	2.09%	54	13,571,982,822	14,153,849,534	104.29	4.45	346
Jun-2017	1.08%	56	15,068,979,065	15,855,345,378	105.22	4.32	330
Jul-2017	1.36%	51	14,504,592,829	15,285,644,193	105.38	4.43	322
Aug-2017	-1.32%	51	14,498,803,898	15,314,365,896	105.63	4.28	305
Sep-2017	0.17%	54	14,355,888,908	14,818,046,329	103.22	4.14	290
Oct-2017	1.04%	46	13,111,219,325	13,494,197,620	102.92	4.15	291
Nov-2017	0.44%	48	14,393,547,162	14,862,545,426	103.26	4.09	285
Dec-2017	2.15%	51	14,481,730,157	14,878,810,812	102.74	4.09	276
Jan-2018	1.86%	48	13,759,885,957	14,367,377,384	104.41	4.26	271
Feb-2018	-0.52%	48	13,318,377,910	14,033,661,986	105.37	4.17	260
Mar-2018	-0.99%	43	13,241,940,466	13,755,399,805	103.88	4.10	248
Apr-2018	1.17%	46	13,884,239,740	14,126,640,355	101.75	4.23	236
May-2018	0.34%	42	12,545,340,421	12,814,841,641	102.15	4.18	229
Jun-2018	-0.14%	39	11,337,757,334	11,505,111,564	101.48	4.16	220
Jul-2018	0.90%	39	11,577,947,012	11,661,871,155	100.72	4.25	216
Aug-2018	1.08%	39	11,253,518,724	11,383,174,288	101.15	4.26	220
Sep-2018	0.61%	36	11,217,440,268	11,400,528,723	101.63	4.25	219
Oct-2018	-0.75%	40	12,003,066,631	12,221,099,442	101.82	4.44	223
Nov-2018	-0.59%	44	12,140,069,625	12,155,219,472	100.12	4.58	230
Dec-2018	-1.12%	41	11,905,003,810	11,780,986,539	98.96	4.63	232
Jan-2019	2.67%	41	11,878,828,384	11,576,357,066	97.45	4.82	231
Feb-2019	0.96%	42	11,690,163,411	11,668,711,493	99.82	4.94	243
Mar-2019	0.24%	46	11,805,116,972	11,843,264,036	100.32	5.05	256
Apr-2019	1.93%	47	11,496,051,271	11,521,401,714	100.22	5.12	263
May-2019	-0.01%	50	12,325,563,537	12,533,604,780	101.69	5.10	262
Jun-2019	1.10%	51	11,881,379,851	12,033,394,898	101.28	5.14	271
Jul-2019	1.19%	48	10,813,358,090	11,040,927,147	102.10	5.21	280
Aug-2019	0.49%	52	11,648,252,778	11,964,317,294	102.71	5.10	283
Sep-2019		52	11,555,452,802	11,866,221,231	102.69	4.99	284

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