

CRTx®

Credit Risk Transfer Return Tracking Index

www.markfontanilla.com/crtx-index

9/30/2019 Index Rebalancing Update

Highlights

The CRTx® Aggregate

Sep 2019 CRTx® Agg Tot. Return	+65 bps
Price Attribution	+22 bps
Paydown Attribution	-3 bps
Cpn Accr&Pmt Attribution	+46 bps

- **The CRTx® Aggregate returned 0.65% for September, finishing up 1.07% for Q3. September was a rare 2019 outperformance month for CRT versus the major fixed income sectors as the recent rate sell-off buffeted longer duration fixed rate markets.** A rebound in seasoned 2015-2017 LMEZZ deal vintages and rallying in recent-issue SUB paper led CRT complex performance. The CRT credit curve saw more bull-flattening on solid demand for credit risk, as evidenced by the latest STACR HLTV deal printing at tighter levels. CRT excess return volatility edged up slightly for the month to 1.82%, which is still on the lower end of the fixed income spectrum.
- **The CRTx® Aggregate market value declined to \$52.9 billion as paydowns outpaced new entries. Index paydowns were 2.05% of UPB for the month, the highest paydown rate since 2016, when mortgage rates were also lower.** B-piece share of the CRT complex continued to grow, now comprising 17.3% of the current CRTx® Aggregate as paydowns accelerated. Four classes from the new STACR 2019-HQA3 deal entered the October Index basket, while one seasoned CAS class paid off. The CRTx® Aggregate basket is now up to 222 constituents across 77 deals.
- **With seasoned 2015-2016 current-pay LMEZZ carry net of paydowns (~40bps/mth currently) at or above carry on newer still-locked out LMEZZ paper, seasoned LMEZZ should now be close to fair value. With the recent curve backup and a Fed cut on the short end reducing coupon entitlements, premium CRT risk may be worth stepping back into. A barbell carry-plus-convexity strategy mixing high-coupon seasoned LMEZZ and SUBs with newer issues may be advantageous at this point in the cycle.**

CRTx® Rebalancing For Oct 2019

As of 9/30/2019

October 2019 Aggregate Constituency (w/MoM Δ):

• Beg. UPB (\$B):	\$50.25	-0.8%
• Beg. Market Value (\$B):	\$52.92	-0.6%
• Constituents:	222	+3
• WAvg Constituent Value:	105.3	+0.26 pts
• WAvg Constituent Coupon:	5.53%	-10 bps

Index Entries*

+ STACR 2019-HQA3 M1/M2/B1/B2

Index Exits

- CAS 2014-C01 M1 (Paid Off)

* These entrants comprise 1.19% of October's Aggregate Beginning Market Value

CRTx® Breakdown For 10/2019

Deal Vintage	Aggregate	UMEZZ	LMEZZ	SUB
All	100%	13.2%	69.5%	17.3%
2019	16.5%	3.2%	9.0%	4.4%
2018	21.5%	3.5%	13.5%	4.5%
2017	22.7%	3.3%	15.0%	4.5%
2016	17.0%	1.5%	13.2%	2.2%
2015	11.0%	1.1%	8.3%	1.7%
<=2014	11.3%	0.7%	10.6%	0.0%

9/30/2019 Index Rebalancing Update (continued)

CRTx® RNI™ Rebalancing For Oct 2019

As of 9/30/2019

October 2019 Aggregate Constituency (w/MoM Δ):

• Beg. UPB (\$B):	\$11.15	-3.5%
• Beg. Market Value (\$B):	\$11.47	-3.3%
• Constituents:	52	+0
• WAvg Constituent Value:	102.93	+0.24 pts
• WAvg Constituent Coupon:	4.90%	-9 bps

Index Entries*

+ STACR 2019-HQA3 M1/M2/B1/B2

Index Exits

- STACR 2018-DNA3 M1/M2/B1/B2

* These entrants comprise 5.49% of October's Aggregate Beginning Market Value

Deal Vintage	CRTx® RNI™ Breakdown For 10/2019			
	Aggregate	UMEZZ	LMEZZ	SUB
All	100%	17.7%	56.1%	26.2%
2019	76.2%	14.6%	41.5%	20.2%
2018	23.8%	3.1%	14.6%	6.0%
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)

Sep 2019 CRTx® RNI™ Tot. Return	+62 bps
Price Attribution	+22 bps
Paydown Attribution	+0 bps
Cpn Accr&Pmt Attribution	+41 bps

- The CRTx® RNI™ posted a 0.62% total return in September, underperforming the broad market CRTx® Aggregate for the first time this year by 3bps. The RNI™'s rolling basket continues to perform well, but a rally in seasoned issues caused the RNI™ to lag the CRT complex on whole. For Q3, the RNI™ is up 2.32% (versus 1.07% for the CRTx® Aggregate), and up 9.54% YTD. Relative to the other major fixed income sectors YTD, the RNI™ on-the-run CRT basket still lags the high-flying IG and HY sectors, but is ahead of the broad fixed income market and Treasuries at this point in the year. New-issue spread tightening combined with relatively good roll-down-the-curve appreciation has buoyed the RNI™ index so far this year.
- The CRTx® RNI™ market value is down to \$11.47 billion as 4 classes “rolled off” while 4 new classes from the latest STACR deal “rolled on” to the October RNI™ basket. The Index constituency stayed at 52 securities from 15 deals with an incrementally higher weighted average constituent market value of 102.93.
- Within the RNI™ basket, UMEZZ and LMEZZ generally returned at-carry, while recent-issue SUBs really drove returns for the month as SUB spreads tightened. While the rolling RNI™ basket and its Sub-Indexes have dramatically outpaced the beta basket of the CRT® Aggregate, spreads may be stabilizing at current levels, and seasoned paper may benefit from stable-to-higher rates. As such, the RNI™-vs.-Aggregate performance differential may narrow over the near term absent a new, sustained rally in rates.

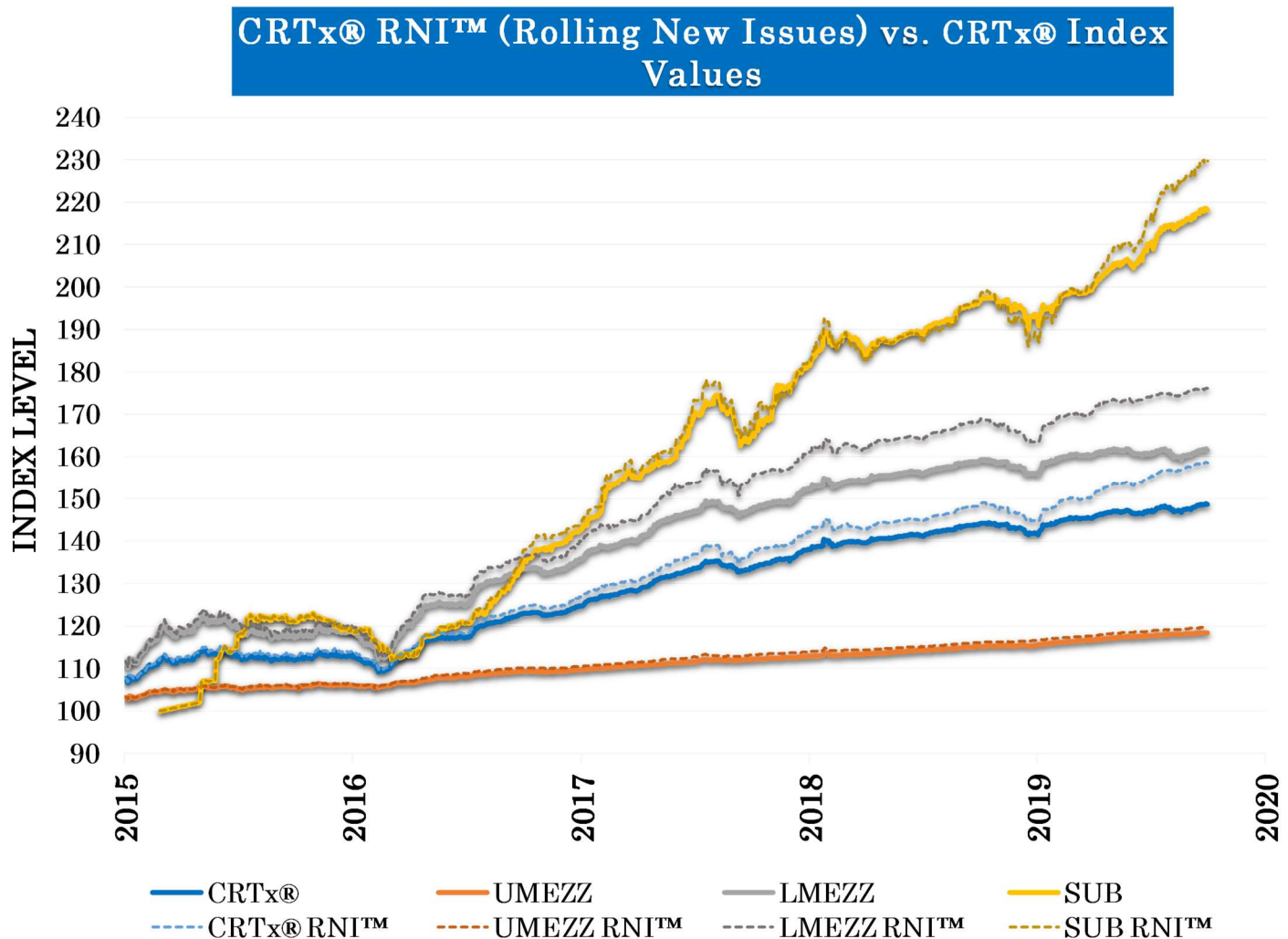
CRTx® Index Suite Total Return Performance (as of Month End 9/30/2019)

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		-0.14%	-0.03%	0.65%	0.65%	1.07%	4.75%	3.23%	6.53%	9/30/19
	Upper Mezzanine	-0.03%	-0.03%	0.19%	0.19%	0.61%	2.58%	2.82%	2.69%	9/30/19
	Lower Mezzanine	-0.16%	-0.01%	0.68%	0.68%	0.54%	3.59%	1.64%	6.62%	9/30/19
	Subordinate	-0.14%	-0.10%	0.93%	0.93%	3.83%	12.75%	11.05%	17.34%	9/30/19
	Upper/Lower Mezz.	-0.14%	-0.01%	0.59%	0.59%	0.55%	3.37%	1.89%	5.40%	9/30/19
	Lower Mezz./Sub.	-0.15%	-0.03%	0.73%	0.73%	1.15%	5.20%	3.28%	7.97%	9/30/19
	CAS	-0.10%	-0.03%	0.65%	0.65%	0.95%	4.70%	3.05%	6.62%	9/30/19
	STACR	-0.19%	-0.02%	0.65%	0.65%	1.23%	4.81%	3.47%	6.43%	9/30/19
	LLTV	-0.12%	-0.03%	0.65%	0.65%	0.98%	4.58%	3.01%	6.44%	9/30/19
HLTV	-0.17%	-0.02%	0.66%	0.66%	1.23%	5.05%	3.63%	6.68%	9/30/19	
Upper Mezzanine	2019	0.00%	0.03%	0.21%	0.21%	0.72%	2.21%	-	-	9/30/19
	2018	0.01%	0.03%	0.22%	0.22%	0.70%	2.64%	3.01%	-	9/30/19
	2017	-0.01%	0.02%	0.22%	0.22%	0.65%	2.52%	2.88%	-	9/30/19
	2016	-0.06%	-0.08%	0.19%	0.19%	0.58%	2.48%	2.74%	2.63%	9/30/19
	2015	-0.10%	-0.25%	0.12%	0.12%	0.36%	2.41%	2.22%	2.58%	9/30/19
	<=2014	-0.40%	-0.41%	-0.14%	-0.14%	0.11%	2.44%	2.12%	2.40%	9/30/19
Lower Mezzanine	2019	-0.02%	0.00%	0.32%	0.32%	0.92%	5.05%	-	-	9/30/19
	2018	-0.14%	-0.05%	0.46%	0.46%	1.31%	7.78%	4.50%	-	9/30/19
	2017	-0.11%	0.06%	0.86%	0.86%	0.67%	4.52%	2.15%	-	9/30/19
	2016	-0.20%	-0.12%	0.91%	0.91%	-0.21%	0.38%	-1.10%	6.56%	9/30/19
	2015	-0.09%	0.10%	0.82%	0.82%	0.22%	1.29%	-0.18%	4.94%	9/30/19
	<=2014	-0.34%	0.01%	0.60%	0.60%	0.36%	2.36%	1.17%	5.49%	9/30/19
Subordinate	2019	-0.06%	0.03%	1.29%	1.29%	6.19%	18.97%	-	-	9/30/19
	2018	-0.19%	-0.12%	1.40%	1.40%	5.19%	18.71%	13.50%	-	9/30/19
	2017	-0.29%	-0.13%	0.98%	0.98%	2.57%	9.92%	6.93%	-	9/30/19
	2016	0.05%	-0.14%	0.27%	0.27%	2.18%	6.85%	9.56%	17.48%	9/30/19
	2015	-0.04%	-0.24%	-0.36%	-0.36%	1.84%	5.10%	7.75%	15.53%	9/30/19
	<=2014									9/30/19

CRTx® RNI™ (Rolling New Issues*) Return Summary										
		RETURNS								
		Period					Annualized			
		Daily	Wkly	Mthly	MTD	QTD	YTD	1-YR	3-YR	As of Date
Aggregate		-0.03%	0.02%	0.62%	0.62%	2.32%	9.54%	6.87%	8.39%	9/30/19
	Upper Mezzanine	0.01%	0.03%	0.21%	0.21%	0.70%	2.64%	3.04%	2.80%	9/30/19
	Lower Mezzanine	-0.03%	0.03%	0.38%	0.38%	1.16%	7.75%	4.57%	8.87%	9/30/19
	Subordinate	-0.05%	-0.03%	1.48%	1.48%	6.47%	21.55%	16.36%	18.55%	9/30/19
	LLTV	-0.03%	0.01%	0.49%	0.49%	1.89%	8.93%	6.07%	7.99%	9/30/19
	HLTV	-0.02%	0.03%	0.83%	0.83%	2.97%	10.58%	8.22%	9.02%	9/30/19

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

CRTx® / CRTx® RNI™ Historical Index Values Comparison (as of Month End 9/30/2019)

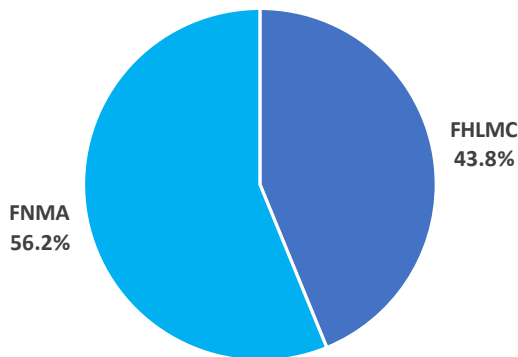


* CRTx® Aggregate Index and Sub Index Constituency

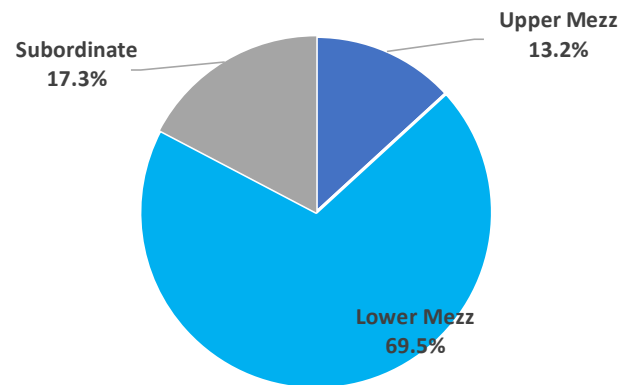
CRTx® Aggregate Index and Sub Index Constituency					
Aggregate	Upper Mezzanine	Lower Mezzanine	Subordinate	LLTV	HLTV
All Index-Eligible FNMA CAS shelf and FHLMC STACR shelf At-Issuance Classes	<u>FNMA CAS Shelf:</u> M1 Classes	<u>FNMA CAS Shelf:</u> M2 Classes	<u>FNMA CAS Shelf:</u> All B Classes	All 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 October 2019 Starting Constituency)

Sponsor % of CRTx® Mkt Val For 10/2019



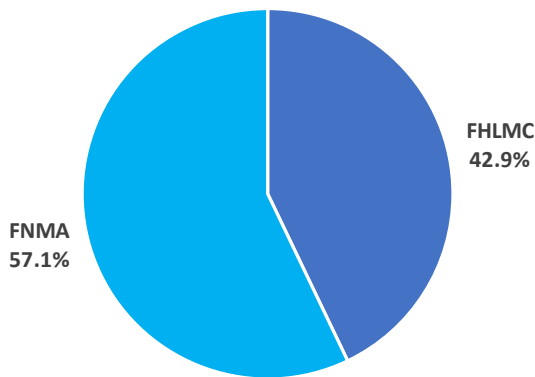
Sub Index % of CRTx® Mkt Val For 10/2019



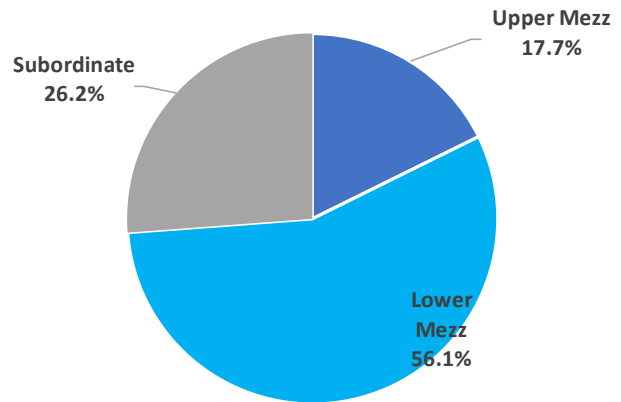
CRTx® Valuation Month	Month End Total Return	Beginning Constituents	Starting UPB	Starting Market Value	Starting Wtd Px + Accr	Starting WAvg Cpn	Starting WAvg Cpn Margin
Oct-2016	-0.38%	132	30,287,269,424	31,604,398,674	104.35	4.37	384
Nov-2016	0.50%	134	30,141,365,379	31,231,159,519	103.62	4.41	387
Dec-2016	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	52,833,120,553	105.76	5.92	349
Jul-2019	0.64%	209	49,366,797,803	52,160,276,911	105.66	5.91	350
Aug-2019	-0.22%	216	50,468,731,712	53,381,992,659	105.77	5.76	349
Sep-2019	0.65%	219	50,665,720,866	53,218,677,450	105.04	5.63	349
Oct-2019		222	50,254,380,617	52,920,221,300	105.30	5.53	351

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

Sponsor % of CRTx® RNI™ Mkt Val For 10/2019



Sub Index % of CRTx® RNI™ Mkt Val For 10/2019



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
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	12,033,434,980	101.28	5.14	271
Jul-2019	1.19%	48	10,813,358,090	11,041,172,540	102.11	5.21	280
Aug-2019	0.49%	52	11,648,252,778	11,964,569,893	102.72	5.10	283
Sep-2019	0.62%	52	11,555,452,802	11,866,682,740	102.69	4.99	284
Oct-2019		52	11,145,361,078	11,471,457,452	102.93	4.90	288

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