CRTx®

<u>C</u>redit Risk Transfer <u>R</u>eturn <u>T</u>racking Inde<u>x</u>

www.markfontanilla.com/crtx-index

CRTx® Index Analytic/Data Suite:

Right-To-Use License Options -Standard Reports, File Layouts, Glossaries, Sample Sets, and Index Portal Functions (Effective 8/1/2023)

		CRTx® In	dex Analytic/Data Suite	
Right-To- Use License	Index Portal	Research		
Option	Access	Reports/Distributions	Enterprise Data Portal Files	Index Portal Screens/Functions
Basic	Level I	Daily Return Summary (daily/email) Index Rebalancing Report (monthly/email) Miscellaneous Releases (varies/email)	None	Index Baskets Guide Daily Returns Evaluation Date Finder Latest Index Rebalancing
Professional	Level II	Daily Return Summary (daily/email) Index Rebalancing Report (monthly/email) Miscellaneous Releases (varies/email)	Constituent File Daily File Daily History File Daily Metrics File Monthly Metrics File-Basic	Index Baskets Guide Daily Returns Evaluation Date Finder Latest Index Rebalancing Structure & Credit Metrics Supply Metrics
Benchmark	Level III	Daily Return Summary (daily/email) Index Rebalancing Report (monthly/email) Miscellaneous Releases (varies/email)	Constituent File Daily File Daily History File Daily Metrics File Monthly Metrics File-Full	Index Baskets Guide Daily Returns Evaluation Date Finder Latest Index Rebalancing Structure & Credit Metrics Supply Metrics Index Desk Reference™ Risk/Return Metrics

CRTx® Research Reports/Distributions

CRTx® Daily Return Summary (Email Distribution)

Availability: Daily on each Index calculation day.

Sample Release

	CR	Tx® (Cre	dit Risk	Transfer	Return ⁻	Tracking	Index) R	eturn Su	mmary		
							RETURN	S			
		Index			Pei	riod			Annu	alized	
		Level	Daily	<u>Wkly</u>	Mthly	<u>MTD</u>	<u>QTD</u>	YTD	<u>1-YR</u>	<u>3-YR</u>	As of Date
		vs. Date	12-30-21	12-23-21	11-30-21	11-30-21	9-30-21	12-31-20	12-31-20	12-31-18	
CRTx [®] Aggregate		163.17	0.02%	0.00%	0.30%	0.30%	0.63%	5.86%	5.86%	4.79%	12-31-21
Upper M	ezzanine	123.73	0.00%	0.01%	0.03%	0.03%	0.21%	0.82%	0.82%	2.35%	12-31-21
Lower M	ezzanine	173.44	0.01%	-0.02%	0.16%	0.16%	0.49%	3.88%	3.88%	3.60%	12-31-21
Sub	ordinate	238.61	0.03%	0.03%	0.51%	0.51%	0.86%	10.73%	10.73%	7.25%	12-31-21
Upper Mezzanine	2022		-	-	-	-	-	-	-	-	12-31-21
	2021	100.69	0.00%	0.01%	0.03%	0.03%	0.21%	0.69%	-	-	12-31-21
	2020	102.51	0.00%	0.01%	0.08%	0.08%	0.19%	0.77%	0.77%	-	12-31-21
	2019		-	-	-	-	-	-	-	-	12-31-21
	2018	108.58	0.00%	-0.02%	0.09%	0.09%	0.30%	1.02%	1.02%	2.14%	12-31-21
	2017	112.38	0.00%	-0.03%	-0.01%	-0.01%	0.21%	0.95%	0.95%	2.09%	12-31-21
	2016		-	-	-	-	-	-	-	-	12-31-21
	2015		-	-	-	-	-	-	-	-	12-31-21
	< =2014		-	-	-	-	-	-	-	-	12-31-21
Lower Mezzanine	2022		-	-	-	-	-	-	-	-	12-31-21
	2021	103.41	0.01%	0.04%	0.11%	0.11%	0.18%	3.41%	-	-	12-31-21
	2020	101.00	0.01%	-0.04%	0.17%	0.17%	0.23%	2.62%	2.62%	-	12-31-21
	2019	112.95	0.01%	0.02%	0.14%	0.14%	0.32%	2.88%	2.88%	-	12-31-21
	2018	115.54	0.00%	0.04%	0.34%	0.34%	0.63%	4.60%	4.60%	5.24%	12-31-21
	2017	130.66	0.01%	-0.02%	0.08%	0.08%	0.63%	4.23%	4.23%	3.98%	12-31-21
	2016	148.30	0.01%	-0.16%	0.00%	0.00%	0.35%	3.52%	3.52%	2.42%	12-31-21
	2015	138.04	0.01%	-0.04%	0.22%	0.22%	0.53%	2.91%	2.91%	2.30%	12-31-21
	<=2014	167.90	0.01%	-0.04%	0.30%	0.30%	0.98%	6.10%	6.10%	3.38%	12-31-21
Subordinate	2022		-	-	-	-	-	-	-	_	12-31-21
Suborumate	2022	107.14	- 0.01%	0.07%	- 0.97%	0.97%	- 0.49%	- 7.14%	-	-	12-31-21
	2021	96.73	0.01%	-0.07%	0.97%	0.97%	0.49%	10.81%	10.81%	-	12-31-21
	2019	131.64	0.07%	0.14%	0.46%	0.46%	0.42%	11.41%	11.41%	-	12-31-21
	2018	127.47	0.00%	0.05%	0.38%	0.38%	0.38%	8.33%	8.33%	9.19%	12-31-21
	2017	157.90	0.01%	0.06%	0.31%	0.31%	1.93%	11.21%	11.21%	5.93%	12-31-21
	2016	197.54	0.03%	0.10%	0.78%	0.78%	1.85%	11.96%	11.96%	4.41%	12-31-21
	2015	208.87	0.02%	-0.35%	0.24%	0.24%	0.72%	4.79%	4.79%	2.60%	12-31-21
	<=2014										12-31-21

CRTx® Research Reports/Distributions (continued)

CRTx® Index Rebalancing Report (PDF/Email Distribution)

Availability: Monthly on the business day after the last business day of each month.

Sample Release (Page 1/Cover)

Mark Fontanilla & Co., LLC

CRT_x®

Credit Risk Transfer Return Tracking Index

CRTx® Index Rebalancing Update 07/31/2023

Inside

Return Roundup

Page 3 The CRTx® Aggregate index posted a 2.34% total return in July, the 4th straight winning month in a row. A bull flattening credit curve, on top of substantial floater carry, continued to buoy GSE CRT returns for the month amid rallying equities and mixed performance across the broader fixed income market. YTD, the sector is outperforming rates and IG/HY, with the CRTx® AGG gaining 11.73% so far, as the GSE CRT market reaches its 10-year anniversary ...

Index Rebalancing Metrics Page 3

The CRTx® basket UPB for August grows +2.0% MoM to \$52.4B, with market value up +3.6% to \$53.9B. Constituents increase to 351 securities from 132 deals as the latest CAS LLTV deals add 8 tranches into the Index, while the 1st GSE CRT deal ever issued STACR 2013-DN1 matures...Benchmark GSE CRT float increased \$1B/1.96% MoM in July, the largest net supply gain since September 2022...

Latest Deal Performance Page 5

DQs continued to oscillate with STACR July DQs posting mixed MoM changes, following June's declines...Speed changes MoM were also modestly mixed, while losses/int. shortfalls were tame, and C/Es just slightly higher ...

Relative Value Thoughts

Page 5 The fundamentals persist ... Again, seasoned paper story continues as scarcity value increases...Recent Issue CRT vs. IG/HY - carry remains king ... as CRT coupons in the 7%-11%+ range ... while secondary corporate coupons overall are 200-400+bps lower...

CRTx® Index Summary Panels Page 2

- CRTx® AGG Index Rebalancing Stats
- CRTx® RNI™ AGG Index Rebalancing Stats

Additional Tables/Metrics Pages 6-13

- CRTx® Index Suite Total Return Performance: Month-End Matrix
- CRTx® Index Basket History: Select Metrics
- CRTx[®] RNI[™] Index Basket History: Select Metrics
- Latest Deal Performance Metrics: CAS
- Latest Deal Performance Metrics: STACR

MARKET INDEXES

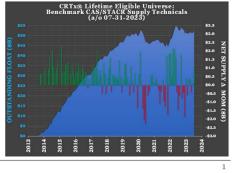
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CRTx® & RNI^{IM} Index Suites: Historical Levels



Sector Musings A Decade Of Benchmark GSE CRT

The first benchmark GSE CRT deal in history, Freddie Mac's STACR 2013-DN1, just matured this month, marking the 10-year anniversary of the GSE CRT market. The 2nd sector deal ever issued. Fannie Mae's CAS 2013-C01 is slated to mature in October, and after a decade, the market has evolved into a staple asset in mortgage credit securitization. Since inception in 2013, there have been 136 deals, totaling over \$131B in lifetime issuance, referencing nearly \$4.6T in loans. Based on the CRTx® Aggregate Index, if you had invested in the first 2013 deals, and stayed reinvested in the market to now, your total return would be 83.2%, or a simple annualized rate of 6.24%. Not bad versus rates and credit in the age of lower-to-higher rates.



CRTx® Enterprise Data Files Via MFCo Data Portal

- Specific index enterprise data file accessibility depends upon the Client's right-to-use index license option selected.
- Data Portal access credentials and required usage agreement is separate from Index Portal online access credentials and digital agreement.

Index enterprise data files can be accessed 2 ways via the MFCo Client Data Portal

1) Web interface at: <u>https://markfontanilla.files.com</u> (sample view below)

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- 2) Secure File Transfer Transfer Protocol (SFTP) or FTP File Server Location
 - i. Clients will have their own secure password-authenticated SFTP/FTP location for "pull" file access of CRTx® Index data files.

CRTx® Constituent File

Availability: Released on the last business day of the month (.xls file format)

Glossary & Layout

	CONSTITUENT FILE		
ELEMENT NAME	DESCRIPTION	TYPE	FORMAT
Sequence	Index entry sequence number.	ALPHA-NUMERIC	X(4)
Class	Individual security class name.	ALPHA-NUMERIC	X(30)
CUSIP	Unique 9-Digit alphanumeric security identifier.	ALPHA-NUMERIC	X(9)
Shelf	Issuer shelf name acronym.	ALPHA-NUMERIC	X(20)
Pool_Type	Reference pool collateral type: LLTV (Low Loan to Value), HLTV (High	ALPHA-NUMERIC	X(10)
	Loan to Value).		
Tranche_Type	First-level Sub-Index categorization: UMEZZ (Upper Mezzanine),	ALPHA-NUMERIC	X(10)
	LMEZZ (Lower Mezzanine), SUB (Subordinate).		
Deal_Vintage	Year of deal issuance.	NUMERIC	9999
Valuation Month	Monthly constituent market value weighting in index.	NUMERIC	9999.999999999
Weighting			

Sample Data

Sequence	1	2	3	4	5	6	7	8	9	10
Class	STACR 2013-	STACR 2013-	CAS 2013-C01	CAS 2013-C01	STACR 2013-	STACR 2013-	CAS 2014-C01	CAS 2014-C01	STACR 2014-	STACR 2014-
Class	DN1 M1	DN1 M2	M1	M2	DN2 M1	DN2 M2	M1	M2	DN1 M1	DN1 M2
CUSIP	3137G0AA7	3137G0AB5	30711XAA2	30711XAB0	3137G0AC3	3137G0AD1	30711XAC8	30711XAD6	3137G0AK5	3137G0AL3
Shelf	STACR	STACR	CAS	CAS	STACR	STACR	CAS	CAS	STACR	STACR
Pool Type	LLTV	LLTV	LLTV	LLTV	LLTV	LLTV	LLTV	LLTV	LLTV	LLTV
Tranche Type	UMEZZ	LMEZZ	UMEZZ	LMEZZ	UMEZZ	LMEZZ	UMEZZ	LMEZZ	UMEZZ	UMEZZ
Deal Vintage	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014
1/1/2015	0.01689380	0.02531842	0.02334800	0.03060363	0.01644940	0.03258053	0.02752222	0.03191281	0.01872132	0.02993733
2/1/2015	0.01653839	0.02510174	0.02268256	0.03078485	0.01598361	0.03271725	0.02684673	0.03260844	0.01854249	0.03035645
3/1/2015	0.01333736	0.02095269	0.01845555	0.02577721	0.01287751	0.02780969	0.02181217	0.02726594	0.01517331	0.02531948
4/1/2015	0.01243317	0.01978273	0.01737978	0.02434383	0.01205826	0.02612723	0.02066603	0.02570366	0.01442764	0.02416604
5/1/2015	0.01141040	0.01871482	0.01603238	0.02296315	0.01104458	0.02503224	0.01912706	0.02452003	0.01346956	0.02278927
6/1/2015	0.01030440	0.01741653	0.01450873	0.02154548	0.00998221	0.02315969	0.01738940	0.02283723	0.01246289	0.02111618

CRTx® Daily File

Availability: Released daily on Index Valuation days (.xls file format)

Glossary & Layout

	DAILY FILE		
ELEMENT NAME	DESCRIPTION	TYPE	FORMAT
	PART 1: DAILY INDEX VALUES	·	
Valuation Date	Day of Index calculations.	DATE	M/D/YYYY
AGG	CRTx® Aggregate Index level (daily).	NUMERIC	9999.999999999
UMEZZ	Upper Mezzanine Sub-Index level (daily).	NUMERIC	9999.999999999
LMEZZ	Lower Mezzanine Sub-Index level (daily).	NUMERIC	9999.99999999
SUB	Subordinate Sub-Index level (daily).	NUMERIC	9999.99999999
UMEZZ/LMEZZ	Upper/Lower Mezzanine Sub-Index level (daily).	NUMERIC	9999.99999999
LMEZZ/SUB	Lower Mezzanine/Subordinate Sub-Index level (daily).	NUMERIC	9999.99999999
CAS	CAS Sub-Index level (daily).	NUMERIC	9999.99999999
STACR	STACR Sub-Index level (daily).	NUMERIC	9999.99999999
LLTV	Low LTV Sub-Index level (daily).	NUMERIC	9999.99999999
HLTV	High LTV Sub-Index level (daily).	NUMERIC	9999.99999999
	UMEZZ DEAL VINTAGE SUB-INDEXES		•
	LMEZZ DEAL VINTAGE SUB-INDEXES		
	SUB DEAL VINTAGE SUB-INDEXES		
	PART 2: DAILY RETURN VALUES		
Valuation Date	Day of Index calculations.	DATE	M/D/YYYY
AGG	CRTx® Aggregate Index daily return (daily).	NUMERIC	99.99%
UMEZZ	Upper Mezzanine Sub-Index daily return (daily).	NUMERIC	99.99%
LMEZZ	Lower Mezzanine Sub-Index daily return (daily).	NUMERIC	99.99%
SUB	Subordinate Sub-Index daily return (daily).	NUMERIC	99.99%
UMEZZ/LMEZZ	Upper/Lower Mezzanine Sub-Index daily return (daily).	NUMERIC	99.99%
LMEZZ/SUB	Lower Mezzanine/Subordinate Sub-Index daily return (daily).	NUMERIC	99.99%
CAS	CAS Sub-Index daily return (daily).	NUMERIC	99.99%
STACR	STACR Sub-Index daily return (daily).	NUMERIC	99.99%
LLTV	Low LTV Sub-Index daily return (daily).	NUMERIC	99.99%
HLTV	High LTV Sub-Index daily return (daily).	NUMERIC	99.99%
	UMEZZ DEAL VINTAGE SUB-INDEXES	·	·
	LMEZZ DEAL VINTAGE SUB-INDEXES		
	SUB DEAL VINTAGE SUB-INDEXES		

Sample Data

Valuation Date	AGG	UMEZZ	LMEZZ	SUB	UMEZZ_LMEZZ	LMEZZ_SUB	CAS	STACR	LLTV
1/2/2015	107.63951462	103.19798837	111.59998065		107.63951462	111.59998065	104.06600363	108.99694476	107.62317686
1/5/2015	107.13515288	102.97959150	110.80562311		107.13515288	110.80562311	103.61870278	108.44289909	107.08026096
1/6/2015	106.67390988	102.77519305	110.08396001		106.67390988	110.08396001	103.20506113	107.94114270	106.58320216
Valuation Date	AGG	UMEZZ	LMEZZ	SUB	UMEZZ_LMEZZ	LMEZZ_SUB	CAS	STACR	LLTV
Valuation Date 1/2/2015	AGG	UMEZZ	LMEZZ	SUB	UMEZZ_LMEZZ	LMEZZ_SUB	CAS	STACR	LLTV
	AGG -0.47%	UMEZZ -0.21%	LMEZZ -0.71%	SUB	UMEZZ_LMEZZ -0.47%	LMEZZ_SUB -0.71%	CAS -0.43%	STACR -0.51%	LLTV -0.50%

CRTx® Daily Metrics File (*)

Availability - Released end-of-day on each Index calculation date (.xls file format)

Glossary & Layout

	DAILY METRICS FILE (1)		
ELEMENT NAME	DESCRIPTION	End	FORMAT
Val_Dt	Day of Index calculations.	DATE	M/D/YYYY
Index	Index/Sub-Index name within CRTx® Index Suite	ALPHA-NUMERIC	X(30)
MTDTotRet	Month-to-date Index total return percentage.	NUMERIC	99.99%
MTDPriceRet	Month-to-date Index return percentage contributed by consitutuent	NUMERIC	99.99%
	price changes.		
MTDAccrRet	Month-to-date Index return percentage contributed by coupon	NUMERIC	99.99%
MTDCPNRet	Month-to-date Index return percentage contributed by coupon	NUMERIC	99.99%
MTDPaydownRet	Month-to-date Index return percentage contributed by principal	NUMERIC	99.99%
MTDWritedownRet	Month-to-date Index return percentage contributed by principal	NUMERIC	99.99%
MTDIntShortRet	Month-to-date Index return percentage contributed by interest	NUMERIC	99.99%
BOMConstituents	Beginning-of-month Index basket constituent count.	NUMERIC	9999
BOMUPB	Beginning-of-month Index aggregate unpaid principal balance.	NUMERIC	9(13).99
BOMMktVal	Beginning-of-month Index aggregate cash market dollar value.	NUMERIC	9(13).99
BOMWAvgSecMktVal	Beginning-of-month Index weighted average security cash market	NUMERIC	999.99
	value (price + accrued interest).		
BOMWAvgCPNMargin	Beginning-of-month Index weighted average security coupon margin	NUMERIC	9999
BOMWAvgCPN	Beginning-of-month Index weighted average security coupon rate.	NUMERIC	99.999
EODParWAvgPx	End-of-day Index par-weighted average security cash market price	NUMERIC	99.99
	(clean w/o accrued interest).		
EODWAvgDM	End-of-day Index weighted average security discount margin (in bps,	NUMERIC	9999
	available starting 6/2022).		
EODW AvgLife (2)*	End-of-day Index weighted average life (available starting 6/2022).	NUMERIC	99.99
EODW AvgDur (2)*	End-of-day Index weighted average modified duration (available	NUMERIC	99.99
	starting 6/2022).		
EODWAvgCvx (2)*	End-of-day Index weighted average convexity (available starting 6/2	NUMERIC	99.99
EODW AvgYld (2)*	End-of-day weighted average yield (available starting 6/2022).	NUMERIC	99.99
EODIndexVal	End-of-day Index Value.	NUMERIC	9999.999999999

* Due to a calculation convention change from the Index's security pricing/information source (Refinitiv/LSEG), certain data elements, and all corresponding files, will reflect this change effective 5/31/2022 (history will NOT be back-filled).

(1) A separate Daily Metrics File is provided for the CRTx® Aggregate and each 1st-Level Sub-Index

(2) Calculation convention based on 1) static rates and 2) 10CPR/0CDR to the earlier of a) optional redemption date or b) maturity date, as of 5/31/2022 (Note: Prior to 5/31/2022, values were calculated to maturity date).

Sample Data

Val_Dt	Index	MTDTotRet	MTDPriceRet	MTDAccrRet	MTDCPNRet	MTDPaydownRet	MTDWritedownRet	MTDIntShortRet	BOMConstituents	BOMUPB
12/8/2022	CRTx® SUB	0.64%	0.41%	0.22%	0.00%	0.00%	0.0000%	0.0000%	157	23534820356
12/9/2022	CRTx® SUB	0.80%	0.55%	0.25%	0.00%	0.00%	0.0000%	0.0000%	157	23534820356
12/12/2022	CRTx [®] SUB	0.92%	0.59%	0.33%	0.00%	0.00%	0.0000%	0.0000%	157	23534820356
12/13/2022	CRTx® SUB	1.19%	0.83%	0.36%	0.00%	0.00%	0.0000%	0.0000%	157	23534820356
12/14/2022	CRTx [®] SUB	1.29%	0.90%	0.39%	0.00%	0.00%	0.0000%	0.0000%	157	23534820356
12/15/2022	CRTx® SUB	1.69%	1.27%	0.42%	0.00%	0.00%	0.0000%	0.0000%	157	23534820356
12/16/2022	CRTx® SUB	1.74%	1.30%	0.44%	0.00%	0.00%	0.0000%	0.0000%	157	23534820356

CRTx® Enterprise Data Files Via MFCo Data Portal (continued)

CRTx® Daily Metrics File (continued)

Sample Data (continued)

BOMMktVal	BOMWAvgSecMkt	BOMWAvgCPNMa	BOMWAvgCPN	EODParWAvgPx	EODWAvgDM	EODWAvgLife	EODWAvgDur	EODWAvgCvx	EODWAvgYld	EODIndexVal
22192497336	94.3	567	9.43	94.56	657	4.66	3.46	0.36	10.84	230.18728746
22192497336	94.3	567	9.43	94.69	654	4.66	3.46	0.36	10.84	230.57235524
22192497336	94.3	567	9.43	94.72	653	4.65	3.46	0.36	10.82	230.84848220
22192497336	94.3	567	9.43	94.95	648	4.65	4.85	0.36	10.78	231.45471399
22192497336	94.3	567	9.43	95.01	647	4.65	4.84	0.36	10.78	231.68260680
22192497336	94.3	567	9.43	95.37	640	4.64	4.84	0.36	10.72	232.59764753
22192497336	94.3	567	9.43	95.39	639	4.64	4.84	0.36	10.72	232.72056939

<u>CRTx® Monthly Metrics File – Basic and Full Versions</u> (*)

Availability - Released on the last business day of the month (.xls file format)

Glossary & Layout

	MONTHLY METRICS FILE (1)		
ELEMENT NAME	DESCRIPTION	TYPE	FORMAT
Val_Dt	Last business day of the respective Valuation Month.	DATE	M/D/YYYY
ndex	Index/Sub-Index name within CRTx® Index Suite.	ALPHA-NUMERIC	X(30)
MTDTotRet	Period total return percentage.	NUMERIC	99.99%
PriceRet	Period return percentage contributed by month-to-date consitutuent	NUMERIC	99.99%
	price changes.		
AccrRet	Period return percentage contributed by month-to-date coupon	NUMERIC	99.99%
	accruals.		
CPNRet	Period return percentage contributed by month-to-date coupon	NUMERIC	99.99%
	payments.		
PaydownRet	Period return percentage contributed by month-to-date principal	NUMERIC	99.99%
	payments.		
WritedownRet	Period return percentage contributed by month-to-date principal	NUMERIC	99.99%
	writedowns.		
ntShortRet	Period return percentage contributed by month-to-date interest	NUMERIC	99.99%
	shortfalls.		
BegConstituents	Number of index constituents for each respective valuation month.	NUMERIC	9999
BegUPB	Unpaid principal balance of all index constituent securities starting	NUMERIC	9(13).99
- 8 -	each respective valuation month.		- (-)
BegMktVal	Total cash market collar value of all index constituent securities	NUMERIC	9(13).99
	starting each respective valuation month.		-()
BegWAvgSecMktVal	Weighted average security cash market value (price + accrued	NUMERIC	999.99
	interest) starting each respective valuation month.		
BegWAvgCPNMargin	Weighted average security coupon margin (in bps) starting each	NUMERIC	9999
202000000000000000000000000000000000000	respective valuation month.	in o inizia do	
BegWAvgCPN	Weighted average security coupon rate starting each respective	NUMERIC	99.999
-0-0-	valuation month.		
EndWAvgDM	Weighted average security discount margin (in bps) at end of each	NUMERIC	9999
	respective valuation month.		
EndWAvgLife (2)*	Constituency weighted average life at end of each respective	NUMERIC	99.99
	valuation month (available starting 5/2018).	nomini	
EndWAvgDur (2)*	Constituency weighted average modified duration at end of each	NUMERIC	99.99
	respective valuation month (available starting 5/2018).	nominit	
EndWAvgCvx (2)*	Constituency weighted average convexity at end of each	NUMERIC	99.99
	respective valuation month (available starting 5/2018).	II O III DICIO	
EndWAvgYld (2)*	Constituency weighted average yield at end of each respective	NUMERIC	99.99
Shaw Avg I lu (2)	valuation month (available starting 5/2018).	NUMERIC	22.22
EndIndexVal	Month-end index value (last business day of the respective Valuation	NUMERIC	9999.99999999
Junucavai	Month).	IN OTWIENCIC	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

* Due to a calculation convention change from the Index's security pricing/information source (Refinitiv/LSEG), certain data elements, and all corresponding files, will reflect this change effective 5/31/2022 (history will NOT be back-filled).

(1) A separate Monthly Metrics File is provided for the CRTx® Aggregate and each 1st-Level Sub-Index

(2) Calculation convention based on 1) static rates and 2) 10CPR/0CDR to the earlier of a) optional redemption date or b) maturity date, as of 5/31/2022 (Note: Prior to 5/31/2022, values were calculated to maturity date).

141.07763220

4.26

CRTx® Enterprise Data Files Via MFCo Data Portal (continued)

5 50

CRTx® Monthly Metrics File (continued)

360

108.8

Sample Data

45959484313

Val_Dt	Index	MTDTotRet	PriceRet	AccrRet	CPNRet	PaydownRet	WritedownRet	IntShortRet	BegConstituents	BegUPB	
5/31/	2018 CRTx® AGG	0.34%	-0.07%	0.01%	0.42%	-0.03%	-0.0013%	-0.0001%	5 171		42241567665
egMktVal		SecMkt\ BegWAy			ndWAvgDM	EndWAvglif	e EndWAvgD	ur EndWAvg	Vx EndWAve		EndIndex

165

4.87

3.91

0.26

Note: The Monthly Metrics Basic Version includes the CRTx® Aggregate, Upper Mezzanine, Lower Mezzanine, and Subordinate indexes. The Full Version contains all CRTx® Index Suite standard indexes, including the new M2, B1, B2, & B index variants.

CRTx® Index Portal Screens/Functions

- Specific CRTx® Index Portal screens/functions accessibility depends upon the Client's right-to-use index license option selected and its associated Index Portal access level (I, II, or III).
- Index Portal access credentials and digital agreement is separate from Index Portal access credentials and usage agreement.

Daily Returns (Access Level I, II, III)

CRTx®:	Index I	Portal	Daily Returns	Find A Valuation Date	Latest Index Rebalancing		Supply Metrics #	Risk/Return Metrics //	Index Baskets Guide	Back To Top
CRTx® Home	Data Portal	UPDATES & NOT	ICES: NEW: M2. B1.	B2. & B index varia	ants added to th	ne CRTx® Suite (in	the Risk/Return N	etrics screen).		Terms of Use

CRTx®	Level	Daily	Wkly	Mthly	MTD	QTD	YTD	1-YR (Ann.)	3-YR (Ann.)	As of Dat
Addredate	184.32	0.01%	0.24%	1.34%	0.61%	2.96%	12.41%	13.38%	8.27%	8/22/202
Upper Mezzanine	133.50	0.02%	0.13%	0.92%	0.40%	1.94%	6.85%	8.12%	3.09%	8/22/202
Lower Mezzanine	194.87	0.00%	0.09%	0.91%	0.48%	2.12%	9.50%	11.14%	6.74%	8/22/202
Subordinate	275.85	0.01%	0.39%	1.90%	0.82%	4.17%	17.83%	18.06%	12.96%	8/22/202
Suboraniate	275.00	0.017	0.0776	1.7 070	0.0270			10.0070	12.7070	0,22,201
Upper/Lower Mezz.	170.34	0.01%	0.11%	0.91%	0.44%	2.03%	8.22%	9.69%	6.04%	8/22/202
Lower Mezz./Sub.	212.72	0.00%	0.27%	1.51%	0.69%	3.36%	14.51%	15.36%	9.11%	8/22/202
CAS	180.26	0.01%	0.16%	1.11%	0.49%	2.47%	10.59%	12.58%	8.28%	8/22/202
STACR	184.24	0.01%	0.29%	1.50%	0.68%	3.26%	13.55%	13.84%	8.20%	8/22/202
LLTV	182.89	0.01%	0.27%	1.38%	0.68%	2.83%	11.77%	13.24%	8.29%	8/22/202
HLTV	165.27	0.01%	0.16%	1.26%	0.46%	3.20%	13.75%	13.71%	8.28%	8/22/202
Upper Mezzanine 2023	105.27	0.03%	0.10%	0.94%	0.33%	2.01%				8/22/202
2022	107.57	0.03%	0.15%	0.86%	0.41%	1.92%	6.93%	8.33%	1	8/22/202
									-	
2021	106.84	0.02%	0.14%	1.25%	0.51%	1.90%	6.21%	6.59%		8/22/202
2020		-	242		-		-	-	24	8/22/202
2019			-	-	-		-			8/22/202
2018			2.4	-	-		-	-	14	8/22/202
2017		-		-		-	-			8/22/202
2016		120	+		-	12	-	2	14	8/22/202
2015		-		-		-	-	-		8/22/202
<=2014		92	848			2	-	2	-	8/22/202
Lower Mezzanine 2023	109.54	0.00%	-0.05%	0.78%	0.04%	2.99%				8/22/202
2022	109.91	-0.01%	0.09%	1.18%	0.71%	2.67%	11.66%	12.73%		8/22/202
2021	110.07	-0.02%	0.12%	0.93%	0.45%	2.24%	9.82%	10.15%	() () () () () () () () () () () () () (8/22/202
2020	110.07	0.02%	0.13%	0.75%	0.40%	1.27%	6.06%	7.42%	5.14%	8/22/202
2019	122.88	0.02%	0.14%	0.62%	0.42%	1.03%	5.83%	6.78%	4.53%	8/22/202
2018	127.44	0.02%	0.14%	0.79%	0.52%	1.22%	7.15%	8.23%	6.04%	8/22/202
2017	143.49	0.02%	0.14%	0.60%	0.43%	1.14%	5.81%	8.28%	5.40%	8/22/202
2016	168.25	0.02%	0.13%	0.48%	0.39%	0.99%	7.40%	10.31%	6.38%	8/22/202
2015	155.81	0.02%	0.14%	0.42%	0.45%	0.92%	6.41%	10.07%	5.78%	8/22/202
<=2014	184.65	0.02%	0.13%	0.56%	0.42%	0.95%	5.71%	8.07%	10.66%	8/22/202
Subordinate 2023	112.20	0.02%	0.40%	2.93%	0.66%	5.79%				8/22/202
2022	116.30	0.03%	0.18%	2.06%	0.57%	5.35%	19.77%	20.43%		8/22/202
2021	119.21	0.00%	0.34%	2.26%	0.74%	5.42%	23.17%	20.87%		8/22/202
2020	111.50	0.00%	0.68%	2.02%	1.05%	3.97%	18.10%	17.07%	15.64%	
										8/22/202
2019	153.73	-0.02%	0.32%	1.27%	0.96%	2.32%	12.26%	13.80%	13.12%	8/22/202
2018	148.79	0.01%	0.94%	2.21%	1.33%	2.80%	13.54%	15.95%	12.70%	8/22/202
2017	181.89	0.02%	0.14%	0.78%	0.56%	2.18%	11.55%	13.15%	10.33%	8/22/202
2016	233.38	0.03%	0.24%	1.02%	0.76%	1.92%	13.21%	16.03%	13.77%	8/22/202
2015 <=2014	241.35	0.03%	0.24%	1.03%	0.74%	1.79%	10.86%	14.19%	9.02%	8/22/202 8/22/202
DAULY A same set	100 44	0.02%	0.13%	105%	0.57%	2 5 29/	0.02%	10 500	7170	0/00/000
RNI™ Addredate	189.64			1.05%	0.57%	2.52%	9.93%	10.52%	7.17%	8/22/202
RNI™ Upper Mezzanine	134.46	0.02%	0.10%	0.84%	0.36%	1.87%	6.91%	8.29%	3.12%	8/22/202
RNI [™] Lower Mezzanine	211.95	0.01%	0.09%	0.85%	0.92%	2.83%	12.39%	12.94%	5.56%	8/22/202
RNI™ Subordinate	283.77	0.02%	0.37%	2.59%	0.75%	5.29%	17.95%	17.33%	14.15%	8/22/202
RNI™ LLTV	189.34	0.02%	0.06%	1.20%	0.56%	2.57%	9.76%	11.16%	7.18%	8/22/202
RNI TM HLTV	168.25	0.01%	0.34%	0.73%	0.58%	2.42%	10.48%	9.19%	6.96%	8/22/202

CRTx® Daily Return Summary * 🔘

CRTx® Index Portal Screens/Functions (continued)

Evaluation Date Finder (Access Level I, II, III)

CRTx®:	Index	Portal	Daily Returns	Find A Valuation Date	Latest Index Rebalancing	Structures & Credit Metrics #	Supply Metrics #	Risk/Return Metrics #	index Baskets Guide	3.12% 5.56%	Back To Top
A CONTRACTOR OF THE OWNER		and the second second			A STATE OF COMPANY					14.15%	0/77/7072
CRTx® Home	Data Portal	UPDATES & NOT	0.000	B2 & B index vari	4 000/	e CRTx® Suite (in	the Risk/Return I	0 7207	11.16%	7.18%	Terms of Use
Cantingenting	-	UPDATES & NOT	U.C.E.S. IVEW: M2, B1	, BZ, & B Index Vari	ants added to th	e CRIX" Suite (In	the RISK/Return I	vietrics screenj.	9.19%	6.96%	8/22/2023

	Month		Day					Year			
Reset All	12345	6 7 8 9 10 11 12	12345678	8 9 10 11 12 13	14 15 16 17 18 19	20 21 22 23 24 2	25 26 27 28 29 30	31 2015 2016	6 2017 2018 2019 20	020 2021 2022 20	207
onfigurator Cub	1										
and the second											
onfigurator Cub Valuation Date	Index	Index Level	Daily	Wkly	Mthly	мтр	QTD	YTD	1-YR	3-YR	2

Latest Index Rebalancing (Access Level I, II, III)



CRTx® Index Rebalancing Update (8/1/23) Full Report (PDF) 1 2023 CRTx AGG Tot R +234 bpa RTx® vs. CRTx® RNI¹⁴ (R Index Total Return History nth-End Closing Valu 183.21 MARKET INDEXES Price Attribution +156 bps Pavdown Attribution -1 bos CRTx ® Gredit Risk Te Con Accr&Pmt Attribution +78 005 m Tracking Index Vritedown+Int Shortfall Attribution -0.02 bps CRTx* Index Rebalancing Update Excess Return +190 bps Volatility (Annualized) 0.75% UPB Paydown % 0.96% QTD Total Return 2.34% YTD Total Return 11.73% CRTx8 AGG Rebalancing For Aug 2023 (Click to image to enlarge) Asof7/31/2023 August 2023 Aggregate Basket (w/MoM (): The CRTx® Aggregate index posted a 2.34% • Beg. UPB (\$8): \$52.35 +2.0% • Beg. Market Value (\$B): \$53.92 +3.6% total return in July, the 4th straight winning Constituents: 351 +7 month in a row. A bull flattening credit curve, WAvg Constituent Value: 102.99 +1.62 pts on top of substantial floater carry, continued • WAvg Constituent Coupon: 9.28% +8 bps to buoy GSE CRT returns for the month amid Index (+) Entries* & (-) Exits rallying equities and mixed performance across the broader fixed income market. YTD, (+) CAS 2023-R05 1M1/1M2/1B1/1B2 (+) CAS 2023-R061M1/1M2/1B1/1B2 the sector is outperforming rates and IG/HY, with the CRTx® AGG gaining 11.73% so far, as (-) STACR 2013-DN1 M2 (MATURED) the GSE CRT market reaches its 10-year anniversary. *2.82% of 8ec. Index Morket Value

CRTx® Index Rebalancing Update * 🔾

Structure and Credit Metrics (Access Level II, III)⁽¹⁾

CRTx® Index Constituent Deal Structural Map (as of 7-25-2023) Cert All Pade (a) Loss Type (a) Format (a) Desi Group (a) Case Structure (a) Attractases Deal Vintage (a) (a) (a) (a) (a) (a) (a) (a) (a) Deal Vintage (a) (a) (a) (a) (a) (a) (a) (a) (a) (a) Deal Group Loss (a) Pool (a) Format (a) Structure (a) Inactive Classes 30d 60d 90d 120d 150d 100 (a) STACE 2013-DNI LLTV FXDI FXDI LLTV DEBT (a) M1M2 M1M2 (a) (a)<	CP	Typ	Tne	lov (onetitu		nts added to the CRTx®	8		12	5-20	173)	0	
Case Name All All All All All All Deal Unity (11) (11) (12) <		Pool								1 /-2				
Case of All Time			1000			All					\sim	All		
Deal Group Type Type Format Role Group Role Structure Role Inactive Classes Active Classes 30dq 60dq 90dq 120dq 180dq STACR 2013-DN1 LITV FXD1 LITV DEBT G1 M1-M2 M1 M2 0.46 0.00 0.01 0.01 0.00 CAS 2013-C01 LITV FXD1 LITV DEBT G1 M1-M2 M1 M2 0.46 0.00 0.01 0.01 0.00 CAS 2014-C01 LITV FXD1 LITV DEBT G1 M1-M2 M1 M2 0.40 0.07 0.01 0.02 0.01 0.00 STACR 2014-DN1 LITV FXD1 LITV DEBT G1 M1-M2/M3 M1-M2 M3 0.43 0.06 0.02 0.00 <td< th=""><th>Deal Vir (2013) (20</th><th>ntage</th><th></th><th></th><th></th><th>) 2021) 2022)</th><th>(2023)</th><th></th><th>Test Pas</th><th>s</th><th>Test Pass</th><th>Test Pa</th><th>iss DQ</th><th></th></td<>	Deal Vir (2013) (20	ntage) 2021) 2022)	(2023)		Test Pas	s	Test Pass	Test Pa	iss DQ	
CAS 2013-C01 LLTV FXD1 LLTV DEBT G1 M1-M2 M1 M2 0.45 0.06 0.00 0.01 0.01 0.00 STACR 2013-DN2 LLTV FXD1 LLTV DEBT G1 M1-M2 M1 M2 0.36 0.06 0.02 0.01 0.00 CAS 2014-C01 LLTV FXD1 LLTV DEBT G1 M1-M2 M1 M2 0.43 0.06 0.00 0.01 0.02 0.01 0.00 STACR 2014-DN1 LLTV FXD1 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.49 0.06 0.07 0.01 0.02 0.00 CAS 2014-C02 LLTV FXD1 LLTV DEBT G1 IM1-M2 IM1 M2 0.39 0.08 0.02 0.02 0.00 CAS 2014-C02 LLTV FXD1 LLTV DEBT G2 22M1-2M2 2M1 M2 0.58 0.10 0.03 0.02 0.03 0.00 0.00 0.00	Deal Group	1000		Format	Group	Structure	Inactive Classes	Active Classes	30dq	60dq	90dq	120dq	150dq	180dq+
STACR 2013-DN2 LLTV FXD1 LLTV DEBT G1 M1-M2 M1 M2 0.36 0.06 0.02 0.00 0.00 CAS 2014-C01 LLTV FXD1 LLTV DEBT G1 M1-M2 M1 M2 0.40 0.07 0.01 0.02 0.01 0.01 0.02 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 <t< td=""><td>STACR 2013-DN1 LLTV</td><td>FXD1</td><td>LLTV</td><td>DEBT</td><td>G1</td><td>M1-M2</td><td>M1-M2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	STACR 2013-DN1 LLTV	FXD1	LLTV	DEBT	G1	M1-M2	M1-M2							
CAS 2014-C01 LLTV FXD1 LLTV DEBT G1 M1-M2 M1 M2 0.40 0.07 0.01 0.02 0.01 0.02 STACR 2014-DN1 LLTV FXD1 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.43 0.06 0.03 0.01 0.02 0.00 STACR 2014-DN2 LLTV FXD1 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.43 0.06 0.03 0.01 0.02 0.00 CAS 2014-C02 LLTV FXD1 LLTV DEBT G1 1M1-M2 1M1 1M2 0.05 0.01 0.02 0.01 0.00 CAS 2014-C03 LLTV FXD1 LLTV DEBT G1 1M1-M2 1M1 1M2 0.45 0.10 0.03 0.00	CAS 2013-C01 LLTV	FXD1	LLTV	DEBT	G1	M1-M2	M1	M2	0.45	0.06	0.00	0.01	0.01	0.0
STACR 2014-DN1 LLTV FXD1 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.43 0.06 0.03 0.01 0.02 0.00 STACR 2014-DN2 LLTV FXD1 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.49 0.08 0.07 0.01 0.02 0.00 CAS 2014-C02 LLTV FXD1 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.39 0.08 0.02 0.01 0.01 0.00 CAS 2014-C02 LLTV FXD1 HLTV DEBT G1 1M1-1M2 1M1 1M2 0.45 0.10 0.04 0.01 0.01 0.00 CAS 2014-C03 HLTV FXD2 LTV DEBT G1 M1-M2-M3 M1-M2-M3 M1-M2 3 1.13 0.24 0.08 0.02 0.00 0.00 STACR 2014-DN3 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2-M3 M1-M2-M3 M1-M2-M3 0.63 0.15 0.04 0	STACR 2013-DN2 LLTV	FXD1	LLTV	DEBT	G1	M1-M2	M1	M2	0.36	0.06	0.02	0.02	0.01	0.0
STACR 2014-DN2 LLTV FXD1 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.49 0.08 0.07 0.01 0.02 0.00 CAS 2014-C02 LLTV FXD1 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.39 0.08 0.02 0.02 0.01 0.00 CAS 2014-C02 LLTV FXD1 LLTV DEBT G2 2M1-M2 2M1 2M2 0.54 0.10 0.04 0.01 0.01 0.00 CAS 2014-C03 LLTV FXD2 LLTV DEBT G2 2M1-M2 2M1 1M2 0.45 0.10 0.03 0.02 0.03 0.00 CAS 2014-C03 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M1 M12 0.45 0.10 0.08 0.01 0.00 STACR 2014-HO3 LLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.63 0.15 0.04 0.04 0.02 0.00 0	CAS 2014-C01 LLTV	FXD1	LLTV	DEBT	G1	M1-M2	M1	M2	0.40	0.07	0.01	0.02	0.01	0.0
CAS 2014-C02 LLTV FXD1 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.39 0.08 0.02 0.02 0.01 0.00 CAS 2014-C02 HLTV FXD1 HLTV DEBT G2 22M1-2M2 2M1 2M2 0.54 0.10 0.04 0.01 0.01 0.00 CAS 2014-C03 LLTV FXD2 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.45 0.10 0.03 0.02 0.03 0.00 CAS 2014-C03 LLTV FXD2 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.45 0.10 0.03 0.02 0.03 0.00 CAS 2014-C03 LLTV FXD2 LLTV DEBT G1 1M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.02 0.00 STACR 2014-HO3 LLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.63 0.015 0.04 0.02 0.00 0.05 0.01	STACR 2014-DN1 LLTV	FXD1	LLTV	DEBT	G1	M1-M2-M3	M1-M2	M3	0.43	0.06	0.03	0.01	0.02	0.0
CAS 2014-C02 HLTV FXDI HLTV DEBT G2 2M1-2M2 2M1 2M2 0.54 0.10 0.04 0.01 0.01 0.01 0.01 CAS 2014-C03 LLTV FXD2 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.45 0.10 0.03 0.02 0.03 0.00 CAS 2014-C03 HLTV FXD2 LLTV DEBT G2 2M1-M2 2M1 2M2 0.58 0.10 0.03 0.02 0.03 0.00 STACR 2014-HO1 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.02 0.05 0.11 STACR 2014-HO3 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.63 0.15 0.04 0.04 0.02 0.00 STACR 2014-HO3 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.63 0.15 0.04 0.04	STACR 2014-DN2 LLTV	FXD1	LLTV	DEBT	G1	M1-M2-M3	M1-M2	M3	0.49	0.08	0.07	0.01	0.02	0.00
CAS 2014-C03 LLTV FXD2 LLTV DEBT G1 111112 1111 1142 0.45 0.10 0.03 0.02 0.03 0.00 CAS 2014-C03 HLTV FXD2 HLTV DEBT G2 22M1-2M2 2M1 2M2 0.58 0.10 0.03 0.02 0.03 0.00 STACR 2014-HQ1 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.02 0.05 0.11 STACR 2014-HQ2 HLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.02 0.05 0.11 STACR 2014-HQ2 HLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.63 0.15 0.04 0.04 0.02 0.05 0.11 STACR 2014-DN4 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.66 0.22 0.10 0.00 <td>CAS 2014-C02 LLTV</td> <td>FXD1</td> <td>LLTV</td> <td>DEBT</td> <td>G1</td> <td>1M1-1M2</td> <td>1M1</td> <td>1M2</td> <td>0.39</td> <td>0.08</td> <td>0.02</td> <td>0.02</td> <td>0.01</td> <td>0.0</td>	CAS 2014-C02 LLTV	FXD1	LLTV	DEBT	G1	1M1-1M2	1M1	1M2	0.39	0.08	0.02	0.02	0.01	0.0
CAS 2014-C03 HLTV FXD2 HLTV DEBT G2 2M1-2M2 2M1 2M2 0.58 0.10 0.08 0.01 0.01 0.01 STACR 2014-H01 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2-M3 M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.01 0.01 0.01 STACR 2014-H03 HLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.02 0.05 0.11 STACR 2014-H03 HLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.63 0.15 0.04 0.02 0.00 STACR 2014-D04 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.66 0.12 0.01 0.00 0.00 0.01 0.00 0.01 0.00 0.01 0.00 0.01 0.00 0.01 0.01 0.02 0.01 0.02 0.01 0.00	CAS 2014-C02 HLTV	FXD1	HLTV	DEBT	G2	2M1-2M2	2M1	2M2	0.54	0.10	0.04	0.01	0.01	0.0
STACR 2014-H01 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2-M3 M1-M2-M3 M1-M2-M3 M1-M2-M3 M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.02 0.05 0.11 STACR 2014-D03 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.02 0.05 0.11 STACR 2014-HQ2 HLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.63 0.15 0.04 0.04 0.02 0.00 0.05 0.11 STACR 2014-HQ2 HLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2-M3 M1-M2-M3 0.63 0.15 0.04 0.04 0.02 0.00 STACR 2014-D04 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.96 0.22 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	CAS 2014-C03 LLTV	FXD2	LLTV	DEBT	G1	1M1-1M2	1M1	1M2	0.45	0.10	0.03	0.02	0.03	0.0
STACR 2014-DN3 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.02 0.05 0.13 STACR 2014-HQ2 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 1.13 0.24 0.08 0.02 0.05 0.13 STACR 2014-HQ2 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.63 0.15 0.04 0.02 0.00 0.02 0.00 0.02 0.00 0.02 0.00 0.01 0.05 0.01 STACR 2014-D04 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.96 0.22 0.00 0.01 0.05 0.01 CAS 2014-C04 HLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.80 0.01 0.00 0.01 0.05 0.01 STACR 2015-DN1 LLTV FXD2 LLTV DEBT G1 M1-M2-M3-B<	CAS 2014-C03 HLTV	FXD2	HLTV	DEBT	G2	2M1-2M2	2M1	2M2	0.58	0.10	0.08	0.01	0.01	0.00
STACR 2014-H02 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.63 0.15 0.04 0.04 0.02 0.00 STACR 2014-H03 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.96 0.22 0.00 0.01 0.05 0.11 CAS 2014-C04 LLTV FXD2 LLTV DEBT G1 1M1-M2-M3 M1-M2 M3 0.96 0.22 0.00 0.00 0.00 0.00 0.01 0.05 0.11 CAS 2014-C04 LLTV FXD2 LLTV DEBT G1 1M1-M2-M3 M1-M2 M3 0.96 0.22 0.03 0.03 0.02 0.00 CAS 2014-C04 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.40 0.08 0.01 0.00 0.00 0.00 0.00 0.00	STACR 2014-HQ1 HLTV			DEBT		M1-M2-M3	M1-M2-M3							
STACR 2014-H03 HLTV FXD2 HLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.96 0.22 0.10 0.10 0.05 0.11 CAS 2014-C04 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.96 0.22 0.10 0.10 0.05 0.11 CAS 2014-C04 LLTV FXD2 LLTV DEBT G1 1M1-M2-M3 M1-M2 M3 0.96 0.22 0.00 0.03 0.02 0.00 CAS 2014-C04 HLTV FXD2 LLTV DEBT G1 1M1-M2-M3-B M1-M2-M3 B 1.03 0.26 0.01 0.05 0.00 0.01 0.05 0.01 0.05 0.01 0.05 0.01 0.06 0.02 0.11 0.06 0.02 0.11 0.06 0.02 0.11 0.06 0.02 0.11 0.06 0.02	and a second second second second second							2000		2.2		2127	217.7	
STACR 2014-DN4 LLTV FXD2 LLTV DEBT G1 M1-M2-M3 M1-M2 M3 0.96 0.22 0.10 0.10 0.05 0.11 CAS 2014-C04 LLTV FXD2 LLTV DEBT G1 1M1-M2-M3 M1-M2 1M1 1M2 0.56 0.12 0.03 0.03 0.02 0.00 CAS 2014-C04 LLTV FXD2 LLTV DEBT G1 1M1-M2 1M1 1M2 0.56 0.12 0.03 0.03 0.02 0.00 CAS 2014-C04 HLTV FXD2 LLTV DEBT G2 2M1-M2 2M1 2M2 0.87 0.14 0.08 0.01 0.05 0.00 STACR 2015-DN1 LLTV FXD2 LLTV DEBT G1 M1-M2-M3-B M1-M2-M3 B 1.03 0.26 0.01 0.06 0.02 0.01 CAS 2015-C01 HLTV FXD2 LLTV DEBT G1 M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M3-M 0.00 0.05		1.301.24	1000	HARDING STREET	- 1075 A	CARGODIAN STORES		M3	0.63	0.15	0.04	0.04	0.02	0.01
CAS 2014-C04 LLTV FXD2 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.66 0.12 0.03 0.03 0.02 0.00 CAS 2014-C04 HLTV FXD2 HLTV DEBT G2 2M1-2M2 2M1 2M2 0.87 0.14 0.08 0.01 0.05 0.00 STACR 2015-DN1 LLTV FXD2 LLTV DEBT G1 M1-M2-M3-B M1-M2-M3 B 1.03 0.26 0.11 0.06 0.02 0.11 CAS 2015-C01 LLTV FXD2 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.91 0.20 0.09 0.05 0.04 0.00 CAS 2015-C01 LLTV FXD2 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.91 0.20 0.09 0.05 0.04 0.00 CAS 2015-C01 HLTV FXD2 HLTV DEBT G1 M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M3-B 0.44 0.08 0.05 0.04 0.00<		1927 3	392000	0.202.200			100 100 100 100							
CAS 2014-C04 HLTV FXD2 HLTV DEBT G2 2M1-2M2 2M1 2M2 0.87 0.14 0.08 0.01 0.05 0.00 STACR 2015-DN1 LLTV FXD2 LLTV DEBT G1 M1-M2-M3-B M1-M2-M3 B 1.03 0.26 0.11 0.06 0.02 0.11 CAS 2015-C01 LLTV FXD2 LLTV DEBT G1 1M1-M2 1M1 1M2 0.91 0.20 0.09 0.05 0.04 0.00 CAS 2015-C01 HLTV FXD2 LLTV DEBT G1 1M1-M2 1M1 1M2 0.91 0.20 0.09 0.05 0.04 0.00 CAS 2015-C01 HLTV FXD2 HLTV DEBT G2 2M1-2M2 2M1-2M2 2M1-2M2 2M1-2M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M3-M M3-M 0.05 0.05 0.05 0.01 TACR 2015-DNA1 LLTV DEBT G1 M1-M2-M3-B M1-M2				10.00	2 2 3 4 4 C	Constant Sector	and the second second			Contract of		in States		
STACR 2015-DN1 LLTV FXD2 LLTV DEBT G1 M1-M2-M3-B M1-M2-M3 B 1.03 0.26 0.11 0.06 0.02 0.11 CAS 2015-C01 LLTV FXD2 LLTV DEBT G1 1M1-M2 1M1 1M2 0.91 0.20 0.09 0.05 0.04 0.00 CAS 2015-C01 LLTV FXD2 LLTV DEBT G1 1M1-M2 1M1 1M2 0.91 0.20 0.09 0.05 0.04 0.00 CAS 2015-C01 HLTV FXD2 HLTV DEBT G2 2M1-2M2 2M1-2M2 2M1-2M2 2M1-2M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M3-B 0.44 0.08 0.05 0.05 0.01														
CAS 2015-C01 LLTV FXD2 LLTV DEBT G1 1M1-1M2 1M1 1M2 0.91 0.20 0.09 0.05 0.04 0.00 CAS 2015-C01 HLTV FXD2 HLTV DEBT G2 2M1-2M2 2M1-2M2 2M1-2M2 2M1-2M3-B 0.00 0.05 0.04 0.00 STACR 2015-HO1 HLTV FXD2 HLTV DEBT G1 M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B 0.04 0.05 0.05 0.05 0.14 TACR 2015-DNA1 LLTV ACT LLTV DEBT G1 M1-M2-M3-B M1-M2 M3-B 0.44 0.08 0.05 0.05 0.14														
CAS 2015-C01 HLTV FXD2 HLTV DEBT G2 2M1-2M2 2M1-2M2 STACR 2015-H01 HLTV FXD2 HLTV DEBT G1 M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B M1-M2-M3-B 0.44 0.08 0.05 0.05 0.14								17.					1.1.1	
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								M2 D	0.44	0.09	0.05	0.05		0.1
									10000				0.03	

(1) Analytic output elements include key structural features, current delinquency pipeline figures, trigger tests, original and outstanding balances, and deal maturity/optional redemption dates.

Supply Metrics (Access Level II, III)

CRTx®: Index Portal	Daily Returns	Find A Valuation Date	Latest Index Rebalancing	Structures & Credit Metrics #	Supply Metrics #	Risk/Return Metrics m	Index Baskets Guide	.05 .06	0.14 O.L Back To Top
CRTx® Home Data Portal UPDATES & NOTI	CES: NEW: M2, B1,	B2, & B index varia	ints added to th	e CRTx® Suite (in	the Risk/Return M	etrics screen).			Terms of Use

CRTx® Index Eligible Sector Supply Metrics* (\$MM as of 7-31-2023)

Month End	Float	Gross Supply	Pay-downs	Write-downs	Tenders	Net Supply	% Chg MoM
2023-07-31	52,350.98	1,503.76	497.52	18	.00	+1,006.42	+1.96%
2023-06-30	51,344.56	512.00	376.64	0.06	0.00	+135.29	+0.26%
2023-05-31	51,209.27	1,703.94	351.11	0.22	1,780.21	-427.61	-0.83%
2023-04-28	51,636.88	762.00	333.24	0.16	0.00	428.6	0.84%
2023-03-31	51,208.28	611.00	269.24	0.06	0.00	341.69	0.67%
2023-02-28	50,866.59	709.14	276.08	0.10	988.71	-555.76	-1.08%
2023-01-31	51,422.35	730.75	299.95	0.03	0.00	430.77	0.84%
2022-12-30	50,991.58	0.00	315.47	0.51	1,527.44	-1,843.42	-3.49%
2022-11-30	52,835.00	0.00	447.47	0.14	0.00	-447.61	-0.84%
2022-10-31	53,282.61	0.00	474.53	0.27	317.43	-792.23	-1.47%
2022-09-30	54,074.84	2,273.03	465.18	0.28	0.00	1,807.57	3.46%
2022-08-31	52,267.27	1,166.30	509.11	0.14	1,258.41	-601.37	-1.14%
2022-07-29	52,868.64	1,493.11	598.48	0.17	2,331.64	-1,437.18	-2.65%
2022-06-30	54,305.82	2,176.38	689.16	0.38	1,888.03	-401.19	-0.73%
2022-05-31	54,707.01	2,471.03	829.79	0.19	0.00	1,641.05	3.09%
2022-04-29	53,065.96	2,984.38	865.97	0.24	0.00	2,118.18	4.16%
2022-03-31	50,947.78	3,057.61	867.66	0.37	0.00	2,189.58	4.49%
2022-02-28	48,758.20	3,159.89	879.88	0.58	1,708.47	570.95	1.18%
2022-01-31	48,187.25	2,859.26	974.26	1.13	0.00	1,883.88	4.07%
2021-12-31	46,303.37	2,855.84	978.99	2.18	0.00	1,874.67	4.22%
2021-11-30	44,428.70	1,276.00	893.50	0.37	2,090.24	-1,708.11	-3.70%
2021-10-29	46,136.81	2,686.01	944.99	0.04	0.00	1,740.98	3.92%
2021-09-30	44,395.83	1,071.00	977.13	0.08	1,342.98	-1,249.19	-2.74%
2021-08-31	45,645.02	0.00	896.92	0.32	0.00	-897.24	-1.93%
2021-07-30	46,542.26	1,186.00	857.10	0.20	0.00	328.7	0.71%
2021-06-30	46,213.56	550.00	892.87	0.23	0.00	-343.11	-0.74%
2021-05-28	46,556.67	0.00	1,058.11	0.25	0.00	-1,058.37	-2.22%
2021-04-30	47,615.04	950.00	1,207.50	0.02	0.00	-257.51	-0.54%
2021-03-31	47,872.55	1,188.00	1,045.16	0.20	0.00	142.64	0.30%
2021-02-26	47,729.91	1,386.00	933.14	0.38	0.00	452.49	0.96%
2021-01-29	47,277.42	970.00	840.51	0.43	0.00	129.06	0.27%
2020-12-31	47,148.36	790.00	565.97	0.30	0.00	223.74	0.48%
2020-11-30	46,924.62	1,080.00	425.03	0.16	0.00	654.8	1.42%
2020-10-30	46,269.82	1,086.00	551.37	0.18	0.00	534.45	1.17%
2020-09-30	45,735.37	680.00	1,020.66	0.31	0.00	-340.98	-0.74%
2020-08-31	46.076.35	1,088.00	1.693.03	0.39	0.00	-605.42	-1.30%

Index Desk Reference[™] Risk/Return Metrics (Access Level III) ⁽¹⁾⁽²⁾

Style O Dea	ns 178901182 192192016201620172	CRTX® luation Year(s) § 2016 2017 2018 2017 2018 2019 202	Inde	2021 20	Desk 22 (2023) Ind	Ref		nce™	[™] (a		7-3						
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23-07-31 23-06-30 23-05-31 23-04-28 23-03-31 23-02-28 23-02-28 23-02-31	CRTx AGG	The section	Index Mikt Val (\$8)	Ct	WA Mkt Px+Accr	WA Con	Cpn	PriceRet	AccrRet	CPNRet	PrincRet	Writedown Ret	IntShort Ret	MTD TotRet	QTD	YTD	1-YR
23-06-30 23-05-31 23-04-28 23-03-31 23-02-28 23-01-31	CRIXAGG	183,21145	\$52.049	344	101.40	9.21	Maroin 412	1.56%	0.05%	0.73%	-0.01%	0.0004%	-0.0006%	2.34%	2.34%	11.73%	16.059
23-05-31 23-04-28 23-03-31 23-02-28 23-01-31	CRTx AGG	179.02962	\$51,478	341	100.50	9.13	412	0.89%	-0.05%	0.81%	0.00%	-0.0001%	-0.0006%	1.65%	5.16%	9,18%	13,709
23-04-28 23-03-31 23-02-28 123-01-31	CRTx AGG	176,13308	\$51,727	333	100.30	9.01	413	0.49%	0.07%	0.73%	0.03%	-0.0005%	-0.0006%	1.33%	3.46%	7.42%	10.779
23-03-31 23-02-28 23-01-31	CRTx AGG	173.82676	\$50,591	330	98.80	8.77	413	1.42%	-0.03%	0.72%	0.00%	-0.0003%	-0.0006%	2.11%	2.11%	6.01%	8.17%
23-02-28 23-01-31	CRTx AGG	170.24264	\$50.674	327	99.60	8.64	412	-0.91%	0.07%	0.67%	0.00%	-0.0001%	-0.0006%	-0.17%	3.82%	3.82%	6.42%
	CRTx AGG	170.52698	\$50.913	324	99.00	8.51	414	0.82%	-0.12%	0.78%	0.05%	-0.0002%	-0.0006%	1.53%	4.00%	4.00%	5.50%
22-12-30	CRTx AGG	167.95503	\$49.608	322	97.30	8.22	414	1.67%	0.08%	0.68%	0.00%	-0.0001%	-0.0006%	2.43%	2.43%	2.43%	2.87%
	CRTx AGG	163.97148	\$50.795	323	96.10	7.80	410	1.37%	-0.04%	0.71%	0.06%	-0.0011%	-0.0006%	2.09%	1.68%	0.49%	0.50%
22-11-30	CRTx AGG	160.60767	\$51.263	325	96.20	7.30	410	-0.03%	-0.01%	0.65%	0.00%	-0.0003%	-0.0006%	0.61%	-0.41%	-1.57%	-1.28%
22-10-31	CRTx AGG	159.63027	\$52.881	325	97.80	6.64	407	-1.61%	0.05%	0.55%	0.01%	-0.0006%	-0.0005%	-1.01%	-1.01%	-2.17%	-1.74%
22-09-30	CRTx AGG	161.26611	\$51.923	316	99.30	6.34	407	-1.56%	-0.03%	0.57%	-0.01%	-0.0006%	-0.0005%	-1.03%	2.42%	-1.17%	-0.55%
22-08-31	CRTx AGG	162.94367	\$51.179	311	96.80	5.87	406	2.62%	0.04%	0.52%	0.04%	-0.0003%	-0.0005%	3.21%	3.49%	-0.14%	1.03%
22-07-29	CRTx AGG	157.87043	\$52.723	305	97.10	5.21	399	-0.17%	0.02%	0.41%	0.02%	-0.0003%	-0.0005%	0.27%	0.27%	-3.25%	-1.87%
22-06-30	CRTx AGG	157.45302	\$53.913	297	98.60	4.66	388	-1.39%	-0.04%	0.43%	0.02%	-0.0008%	-0.0004%	-0.98%	-1.57%	-3.51%	-1.85%
22-05-31	CRTx AGG	159.01175	\$53.054	291	100.00	4.34	386	-1.40%	0.03%	0.36%	-0.02%	-0.0004%	-0.0004%	-1.03%	-0.60%	-2.55%	-0.20%
22-04-29	CRTx AGG	160.67316	\$50.883	285	99.90	4.14	386	0.13%	-0.02%	0.36%	-0.02%	-0.0005%	-0.0003%	0.44%	0.44%	-1.53%	1.40%
22-03-31 22-02-28	CRTx AGG CRTx AGG	159.96767	\$49.321 \$49.476	280 272	101.20	3.93 3.86	380 378	-1.35%	0.03%	0.31%	-0.03%	-0.0008%	-0.0002%	-1.04%	-1.96%	-1.96%	2.16%
22-02-28	CRTx AGG	163.26933	\$47.722	264	102.70	3.92	383	-0.24%	0.02%	0.32%	-0.03%	-0.0012%	-0.0002%	0.06%	0.06%	0.06%	4.67%
21-12-31	CRTx AGG	163.17299	\$45.851	253	103.20	3.97	389	0.00%	0.00%	0.34%	-0.03%	-0.0049%	-0.0002%	0.30%	0.63%	5.86%	5.86%
21-11-30	CRTx AGG	162.68742	\$47,706	250	103.40	3.92	384	-0.20%	0.00%	0.33%	0.01%	-0.0008%	-0.0002%	0.15%	0.33%	5.54%	7.56%
21-10-29	CRTx AGG	162.45187	\$46.009	243	103.60	3.93	385	-0.10%	0.01%	0.29%	-0.03%	-0.0001%	-0.0002%	0.18%	0.18%	5.39%	9.04%
21-09-30	CRTx AGG	162.15934	\$47.210	240	103.40	3.93	385	0.24%	-0.03%	0.35%	-0.01%	-0.0002%	-0.0002%	0.55%	1.08%	5.20%	9.58%
21-08-31	CRTx AGG	161.27826	\$48.140	242	103.40	3.91	383	-0.07%	0.02%	0.32%	-0.02%	-0.0008%	-0.0001%	0.25%	0.53%	4.63%	10.19%
21-07-30	CRTx AGG	160.87970	\$47.807	239	103.50	3.91	383	-0.01%	-0.01%	0.33%	-0.02%	-0.0005%	-0.0001%	0.29%	0.29%	4.37%	11.76%
21-06-30	CRTx AGG	160.42175	\$47.977	235	103.10	3.90	382	0.35%	0.02%	0.33%	-0.02%	-0.0005%	-0.0001%	0.68%	2.45%	4.07%	11.02%
21-05-28	CRTx AGG	159.33749	\$48.936	238	102.80	3.89	380	0.23%	-0.01%	0.31%	-0.02%	-0.0006%	-0.0001%	0.51%	1.76%	3.37%	20.979
21-04-30	CRTx AGG	158.53491	\$48.748	236	101.80	3.87	378	0.94%	-0.02%	0.34%	-0.01%	0.0000%	-0.0001%	1.25%	1.25%	2.85%	28.039
21-03-31	CRTx AGG	156.58350	\$48.858	235	102.40	3.87	376	-0.54%	0.05%	0.30%	-0.02%	-0.0004%	-0.0001%	-0.21%	1.58%	1.58%	37.79%
21-02-26	CRTx AGG	156.91266	\$48.282	232	102.10	3.90	377	0.31%	-0.03%	0.33%	-0.01%	-0.0009%	-0.0001%	0.59%	1.80%	1.80%	2.83%
21-01-29	CRTx AGG	155.99102	\$47.722	230	101.20	3.92	377	0.90%	0.01%	0.30%	-0.01%	-0.0010%	-0.0001%	1.20%	1.20%	1.20%	2.28%
020-12-31 020-11-30	CRTx AGG CRTx AGG	154.14299	\$46.773 \$45.566	228	99.70 98.50	3.93	378	1.57%	-0.02%	0.36%	0.00%	-0.0007%	-0.0001%	1.91%	4.16%	2.26%	2.26%

(1) NEW: M2, B1, B2, & B index variants added to the CRTx® Index Suite only available via the CRTx® Index Portal Index Desk Reference™ risk/return metrics screen/function.

(2) Analytic output elements are the same as in the Monthly Metrics File on the Data Portal (see page 9-10).

Index Baskets Guide (Access Level I, II, III)

		CRTx [®] Aggregate Index and	Sub Index Constitue	nt Eligibility Guide		
Aggregate	Upj	per Mezzanine	Lower Mezzanine	Subordinate	LLTV	HLTV
(AGG)		(UMEZZ)	(LMEZZ)	(SUB)		
All Index-Eligible FNMA	FNMA CAS Shelf:	FHLMC STACR Shelf:	FNMA CAS Shelf:	FNMA CAS Shelf:	All Index-Eligible	All Index-Eligible
CAS shelf and FHLMC	M1 Classes	M1/M1A/M1B Classes	M2 Classes	All B Classes	FNMA CAS shelf and	FNMA CAS shelf and
STACR shelf At-Issuance		(in M1/M2 structures)			FHLMC STACR shelf	FHLMC STACR shelf At-
Classes			FHLMC STACR Shelf:	FHLMC STACR Shelf:	At-Issuance Classes	Issuance Classes from
		M1/M2 Classes	M2 Classes (in M1/M2	All B Classes	from deals	deals referencing High
		(in M1/M2/M3 structures)	structures)		referencing Low	Loan to Value (HLTV)
	Vintage Sub Index	constituency determined by de	eal/security closing yea	ar (except 2013/2014	Loan to Value (LLTV)	loans
		which are grouped	as "2014").		loans	
PRECOVID:	ssuance prior to Apr	il 2020, MIDCOVID: Issuance fro	om April 2020 to March	2023, POSTCOVID: Iss	uance from April 2023	forward
RNI [™] (Rolling New Issues)	versions of the stand	lard CRTx® Aggregate and Sub-In	dexes have dynamic c	onstituent baskets ma	de up exclusively of t	he most recently issued
		securities within a "rol	ling" 12-month look-ba	ack window.		

Mark Fontanilla & Co., LLC

CRTx® (Credit Risk Transfer Return Tracking Index)

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