USING RISKMANAGER TO STRESS TEST CREDIT RISK TRANSACTIONS

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April 2016

CONTENTS

Introduction 3
Background 3
Collateral Performance Overview 4
Collateral Characteristics 6
Tracking Prepayment and Default Rates 9
Credit Event and Loan Modification 11
Credit Ratings for the CRT Tranches 12
Risk Scenario Analysis in Today's Market 13
Relative Value of the Stressed CRT Pools 18
Stress Testing with the RiskManager – ST Model 20
Conclusion 22

INTRODUCTION

In 2013, Fannie Mae and Freddie Mac began issuing unsecured and unguaranteed debt notes linked to residential mortgage loans. Their purpose was to transfer credit risk from the agencies' mortgage books and to reduce taxpayers' risk, in accordance with the Federal Housing Finance Agency's Conservatorship Strategic Plan.

Called credit risk transfer transactions ("CRTs"), these notes are similar to non-agency residential mortgage-backed securities in many respects. They have gained the attention of investors because the supply of new residential mortgage credit bonds is limited.

This paper introduces the basics of CRTs and describes how to analyze their risk and return profiles using MSCI's RiskManager. To understand the possible performance of CRT notes in distressed and extreme scenarios, we stress tested them using historical cohorts with similar attributes as a proxy and Constant Default Rate from the turbulent market period from 1999 to 2007.

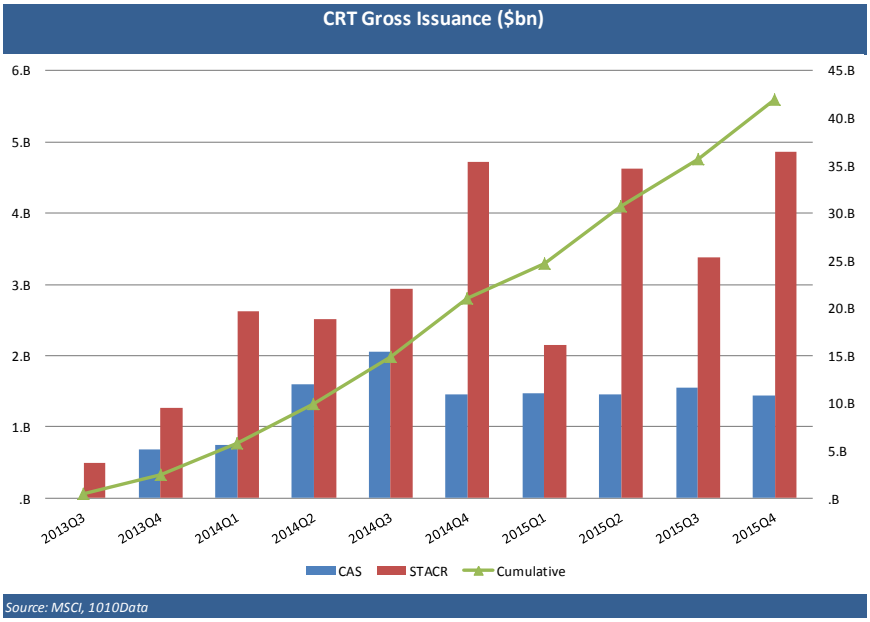
Considering the widening in credit spreads in 2015 and early 2016, we believe RiskManager can help portfolio managers and risk managers better navigate this challenging and growing market.

BACKGROUND

Through CRTs, Fannie Mae and Freddie Mac had cumulatively transferred credit risk on over three million loans or about $800 billion in Unpaid Principal Balances by the end of 2015. (All data in this paper is as of December 31, 2015, unless otherwise stated). The Freddie Mac securities are called Structured Agency Credit Risk (STACR); those issued by Fannie Mae are called Connecticut Avenue Securities (CAS). CRTs have become a convenient way for investors to get exposure to residential credit, and they performed relatively well compared to other structured products in 2014 and 2015.

However, there are still many challenges in investment and risk management regarding these transactions, due to limited historical performance data and uncertainties about the Federal Reserve's rate path, housing market issues, and other macroeconomic trends such as the unemployment rate, household income and the tempo of domestic economic growth.

Exhibit 1: CRT Issuance has been Steady since 2013

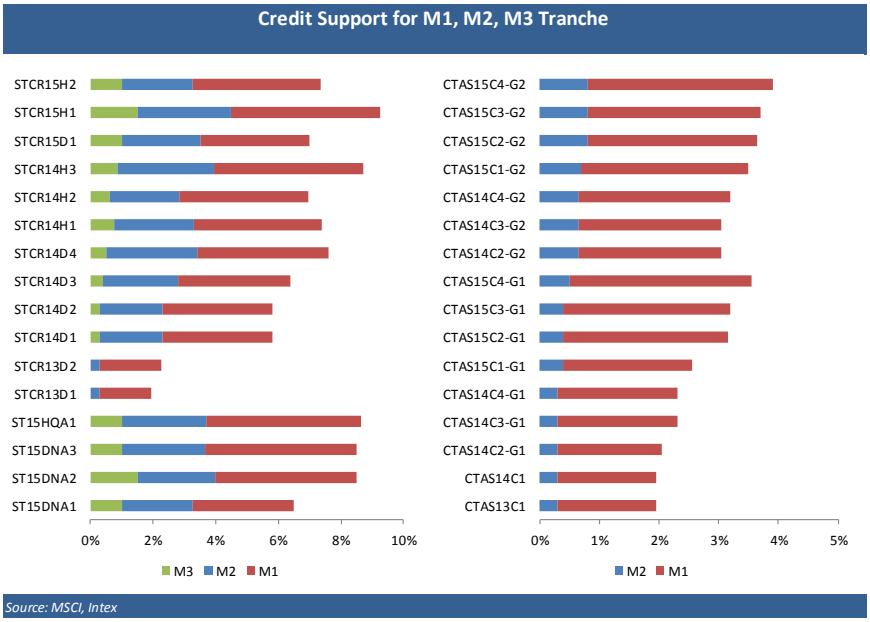


COLLATERAL PERFORMANCE OVERVIEW

CRTs are debt notes that are linked to reference mortgage pools. Reference pools have shown fairly strong credit performance, through the first quarter of 2016, according to 1010Data. With the tightening of underwriting standards after the financial crisis, the mean and median FICO scores on new originations have drifted up approximately 50 points over the last decade. Year-to-year home price appreciation has stayed between 5% and 12% since the first CRT transaction.[1] The original credit support and thickness for all mezzanine tranches are shown in Exhibit 2.

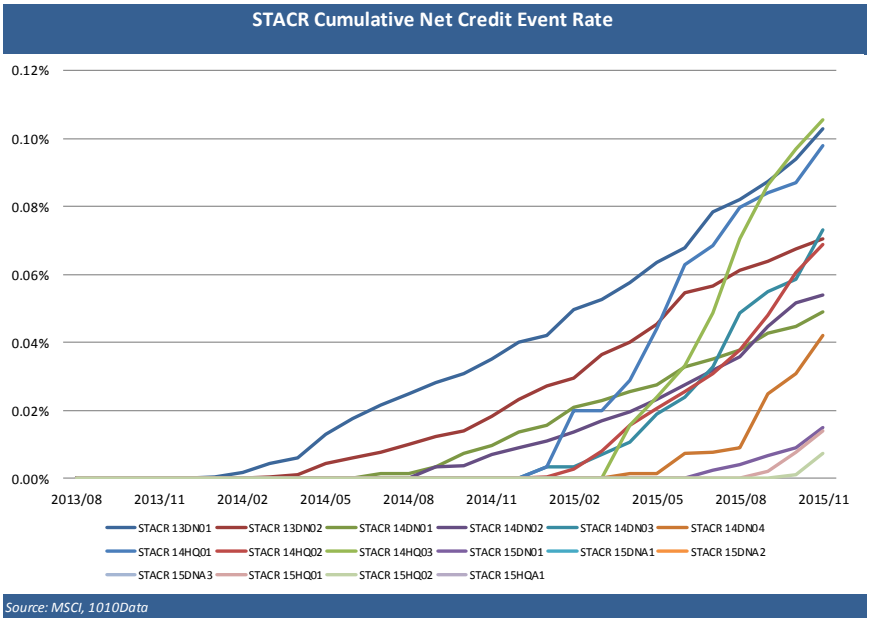
[1] According to Home Price Index from 1010Data.

Exhibit 2: Original Credit Support for CRT Bonds



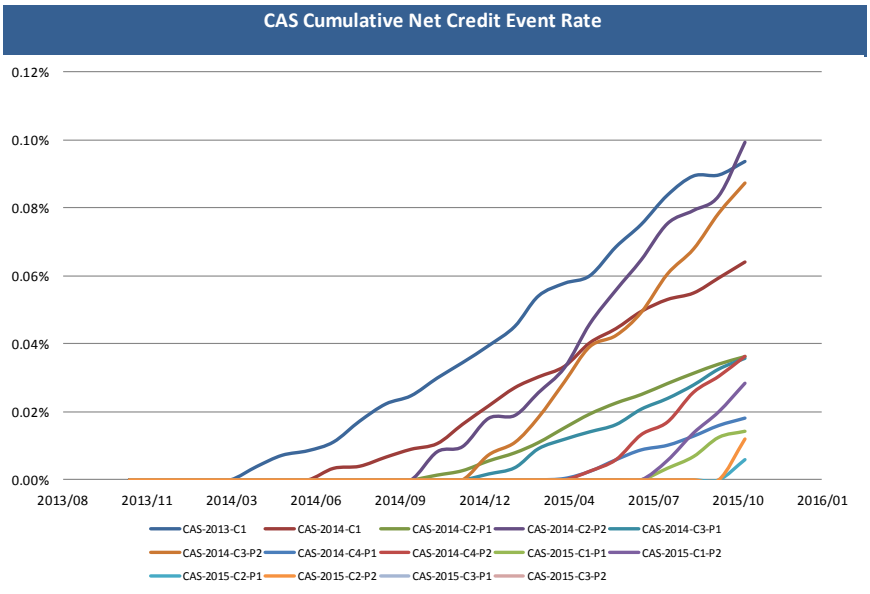
Cumulative net credit event rates are below 10 bps for most deals and still far below the trigger level, as shown in Exhibits 3 and 4. Credit event rates cover a mortgage becoming delinquent, settlement of a short sale, sale of CRT to a third party, execution of a deed in lieu of foreclosure and an REO acquisition.

Exhibit 3: Cumulative Net Credit Event Rate of STACR



Source: MSCI, 1010Data

Exhibit 4: Cumulative Net Credit Event Rate of CAS



Source: MSCI, 1010Data

COLLATERAL CHARACTERISTICS

Loans in the reference pools are generally with highly credit-worthy borrowers. Average original Loan-to-Value is around 75% for a normal series, and 92% for a high LTV series. Deal stratifications for STACR and CAS are shown in Exhibits 5 and 6.

Exhibit 5: STACR Deal Collateral Statistics

STACR Reference Pool Stratification											
DealName	Issue	WALA	WAM	WAC	AvgSize	FICO	LTV	CLTV	DTI	MI	Bal($bn)
13DN01	2013/07	10	347	3.84	$306,527	766	75	76	32	0	$23.1
13DN02	2013/11	7	351	3.60	$312,754	764	74	75	32	0	$35.9
14DN01	2014/02	7	351	3.72	$302,371	761	75	76	33	0	$32.9
14DN02	2014/04	6	351	4.02	$308,876	760	75	76	33	0	$28.5
14DN03	2014/08	7	350	4.55	$297,364	755	76	77	35	0	$20.0
14DN04	2014/10	7	350	4.57	$296,465	753	76	77	35	0	$16.0
14HQ01	2014/08	7	351	4.56	$267,762	752	92	92	35	27	$10.1
14HQ02	2014/09	14	343	3.81	$276,104	757	92	92	33	26	$34.4
14HQ03	2014/10	7	351	4.57	$268,336	749	92	92	35	27	$8.1
15DN01	2015/01	7	351	4.52	$297,145	753	76	77	35	0	$28.0
15DNA1	2015/04	28	326	3.67	$314,439	766	74	75	32	0	$33.8
15DNA2	2015/06	8	349	4.38	$294,050	752	76	77	35	0	$32.5
15DNA3	2015/10	8	350	4.12	$315,899	754	75	76	35	0	$35.2
15HQ01	2015/03	8	349	4.54	$265,341	748	92	92	35	27	$16.8
15HQ02	2015/05	23	333	3.80	$274,314	757	92	92	33	26	$31.7
15HQA1	2015/09	11	347	4.42	$264,367	748	92	92	35	27	$19.8
15HQA2	2015/11	9	349	4.20	$277,966	749	92	92	35	26	$17.4
16DNA1	2016/01	6	352	3.98	$315,401	754	75	76	35	0	$36.2

Source: MSCI, 1010Data

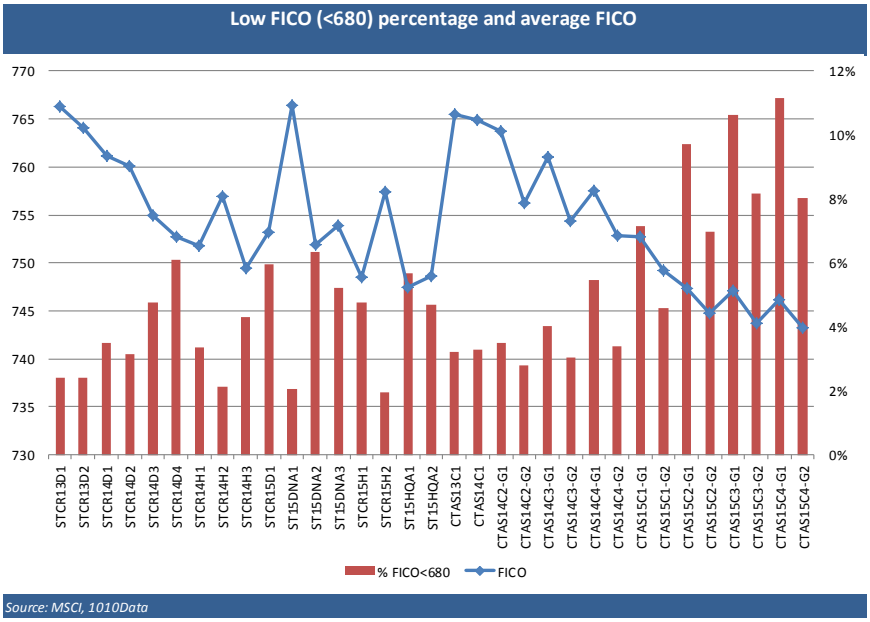
Exhibit 6: CAS Deal Collateral Statistics

CAS Reference Pool Stratification											
DealName	Issue	WALA	WAM	WAC	AvgSize	FICO	LTV	CLTV	DTI	MI	Bal($bn)
2013-C1	2013/08	12	345	3.85	$309,753	765	75	76	32	0	$27.4
2014-C1	2013/11	12	345	3.64	$311,868	765	75	76	32	0	$30.1
2014-C2-P1	2014/03	13	344	3.59	$315,442	764	74	75	32	0	$48.2
2014-C2-P2	2014/03	13	345	3.58	$275,804	756	91	91	33	25	$14.3
2014-C3-P1	2014/05	12	345	3.75	$314,326	761	75	76	33	0	$60.7
2014-C3-P2	2014/05	12	346	3.74	$273,259	754	92	92	33	26	$19.5
2014-C4-P1	2014/10	15	339	4.01	$305,361	757	75	76	33	0	$36.9
2014-C4-P2	2014/10	15	341	4.05	$274,026	753	92	92	34	27	$18.5
2015-C1-P1	2014/12	14	342	4.56	$286,535	753	76	77	34	0	$32.3
2015-C1-P2	2014/12	14	343	4.61	$261,663	749	93	93	35	27	$19.3
2015-C2-P1	2015/03	13	343	4.60	$277,976	747	76	77	35	0	$28.8
2015-C2-P2	2015/03	13	344	4.61	$258,604	745	92	92	35	27	$17.4
2015-C3-P1	2015/05	10	346	4.51	$280,092	747	76	77	34	0	$28.9
2015-C3-P2	2015/05	10	348	4.53	$262,610	744	92	92	35	27	$20.5
2015-C4-P1	2015/09	11	342	4.42	$288,211	746	76	77	35	0	$27.4
2015-C4-P2	2015/09	11	344	4.44	$267,467	743	92	92	35	26	$18.5
2016-C1	2015/12	11	347	4.21	$293,687	747	81	82	34	26	$30.5

Source: MSCI, 1010Data

The quality of the collateral pool and the way CRTs are structured make tail distributions more important than other characteristics. STACR on average has fewer loans with lower FICO scores (<680) than CAS. The average FICO in CAS issuances drifts lower consistently, along with a higher percentage at the lower end. For STACR, both the average and the tail were relatively stable through the first quarter of 2016, according to 1010Data.

Exhibit 7: Average FICOs in CRTs are around 750 with Small Percentages in Risky (FICO<680) Bucket

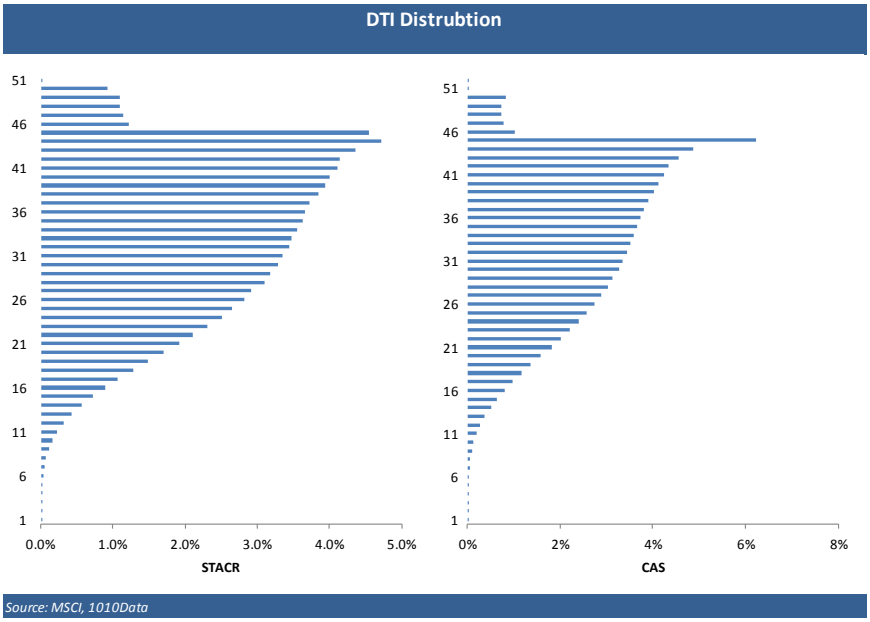


Source: MSCI, 1010Data

According to information from 1010Data, no loan in the reference pool had mortgage insurance (MI), with the exception that every loan in the high LTV series/group was under mortgage insurance paid by the borrower, lender or GSE. Since MI counterparty risk is not shared by investors, the percentage of MI coverage was expected to equivalently reduce LTV exposure to 65% on average.

As a consequence, the high LTV group/series was expected to have a lower severity to compensate for the higher default rate. In terms of Debt to Income, 0.93% of loans in STACR and 0.84% of loans in CAS had a DTI ratio greater or equal to 50; the tail distribution on DTI was well contained for both shelves, as shown in Exhibit 8.

Exhibit 8: DTIs are also Well Contained in CRTs



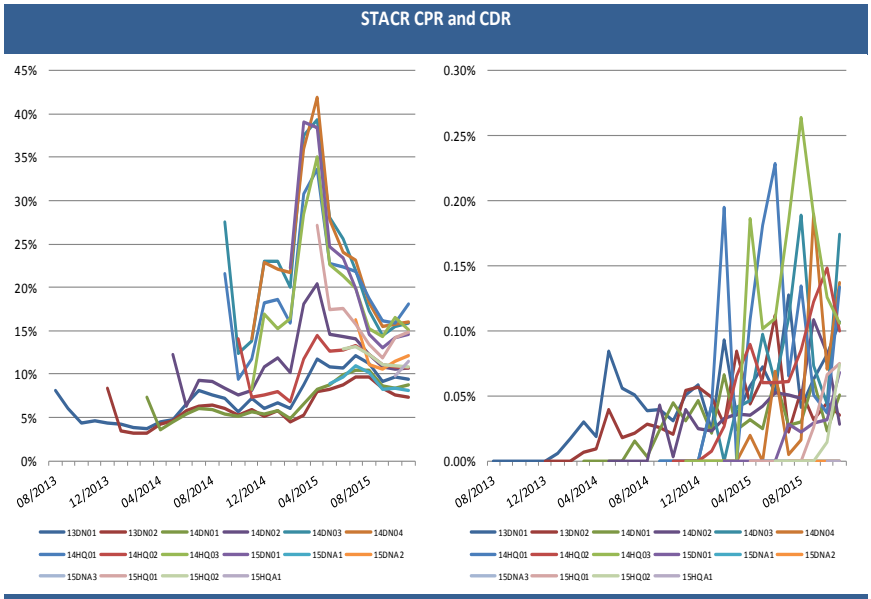
Source: MSCI, 1010Data

TRACKING PREPAYMENT AND DEFAULT RATES

The Conditional Prepayment Rate (CPR) slowed significantly after the second quarter of 2015, with rising mortgage rates, and they seem to have peaked for most STACR and CAS deals. The default rate was around 10 bps during the third quarter of 2015, according to 1010Data. Both the Constant Default Rate (CDR) and the delinquency rate have been consistently low for most deals since origination.

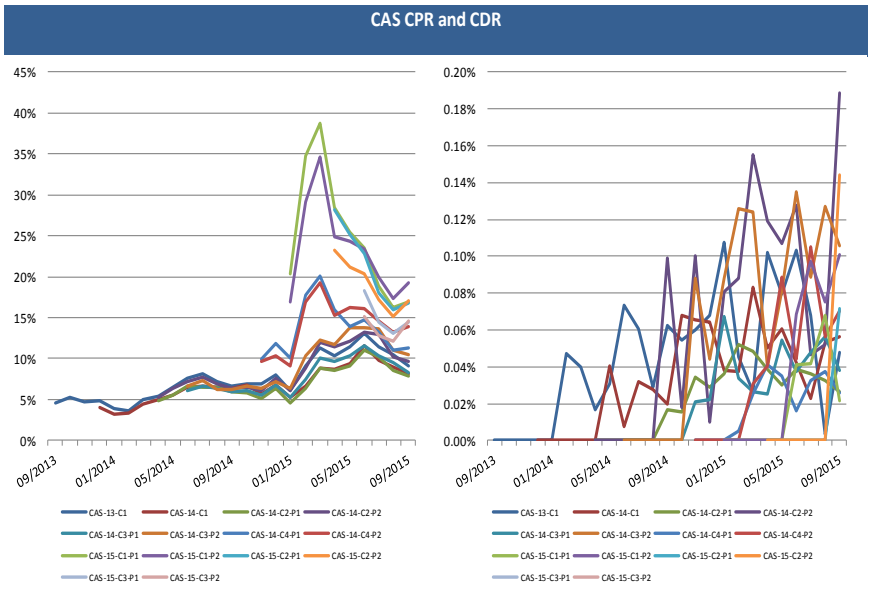
Historical performance data provided by the GSEs (for loans originated from 2000 to 2015) should provide a quick way to evaluate a CRT's potential performance after controlling for FICO/LTV and other cohort factors. Exhibits 9 and 10 show how CPR and CDR have varied over time.

Exhibit 9: STACR Historical CPR and CDR



Source: MSCI, 1010Data

Exhibit 10: CAS Historical CPR and CDR

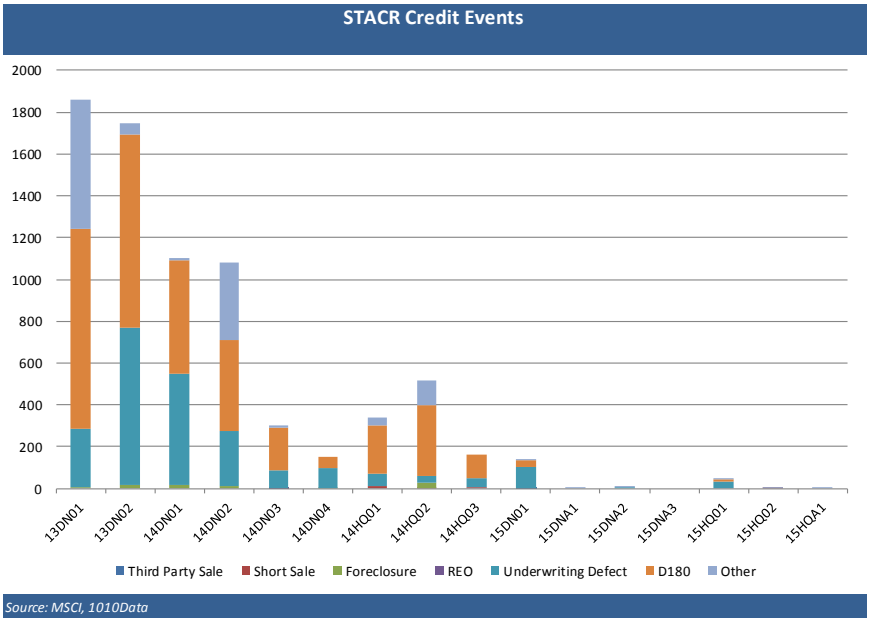


Source: MSCI, 1010Data

CREDIT EVENT AND LOAN MODIFICATION

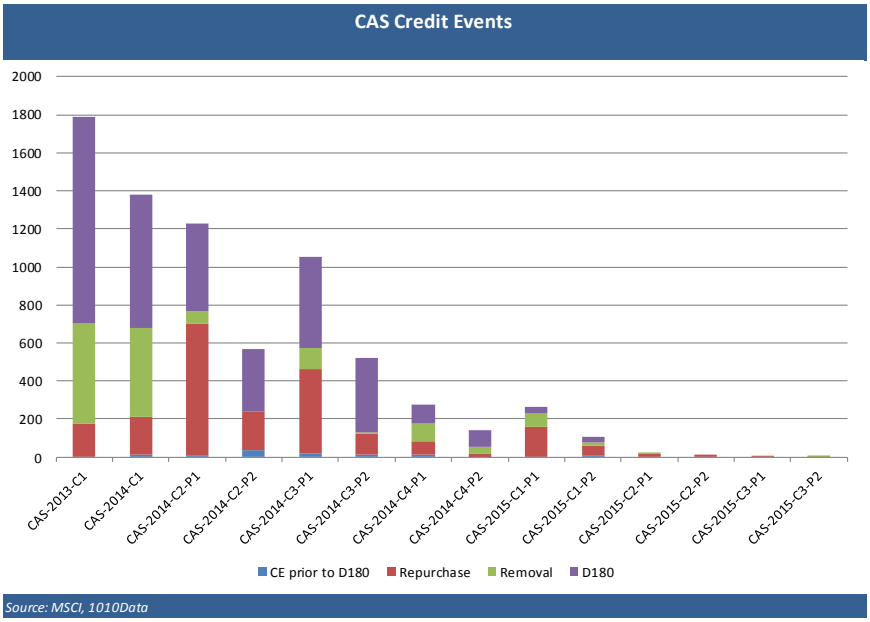
Apart from those that have matured or been prepaid, loans are removed from the reference pool upon certain predefined credit events. If we take a closer look, credit events that are not shared by investors represent a significant portion; their unpaid balance (UPB) would be treated as unscheduled principal for investors. Pre-D180 third-party sale, short sale, deed-in-lieu foreclosure and REO (CE prior to D180) are rare in all deals, as Exhibits 11 and 12 show.

Exhibit 11: Breakdown of STACR Credit Events



Source: MSCI, 1010Data

Exhibit 12: Breakdown of CAS Credit Events



Source: MSCI, 1010Data

Principal reduction and interest shortfall due to loan modification are risks shared by investors for actual loss deals. However, there have been only 116 loan modifications for STACR transactions as of November 2015. All 116 modified loans were extended from 30-year loan term to 40-year loan term, with rate adjustments (both up and down) for some. Based on the GSE loss formula for loan modification, losses/gains are within $500 in most of the cases and are negligible for now.

CREDIT RATINGS FOR THE CRT TRANCHES

As of the end of the first quarter of 2016, half of all CRT securities (in terms of the original balance) are rated by two rating agencies; 3% are rated by only one rating agency; and the rest are unrated. No first loss (B tranche) piece has been rated. Mezzanine tranches are mostly rated from A to BBB. Thirteen STACR and four CAS bonds have been upgraded, and only two CAS bonds (30711XBE3 and 30711XBF0) have been downgraded.

Based on information from Intex, STACR deals see higher ratings in M1 tranches than STACR 1M1 and 2M1 classes. STACR also receives better overall credit rating coverage, with some of the M2 and M3 tranches rated. None of the M2 class in CAS has a credit rating. Ratings for M1 tranches are shown below.

Exhibit 13: Original Credit Ratings of CRT M1

Credit Suppport and Original Rating of M1 Tranche									
DealName	Cusip	Tranche	Origspt	Curspt	FT	MD	SP	DB	KR
CTAS13C1	30711XAA2	M1	1.65	1.99	BBB-				
CTAS14C1	30711XAC8	M1	1.65	1.92	BBB-	Baa2			
CTAS14C2	30711XAE4	1M1	1.75	1.99	BBB-		BBB-		
CTAS14C2	30711XAG9	2M1	2.4	2.8	BBB+		BB		
CTAS14C3	30711XAJ3	1M1	2	2.26	BBB-			BBB	
CTAS14C3	30711XAL8	2M1	2.4	2.77	BBB			BBB	
CTAS14C4	30711XAN4	1M1	2	2.32		Baa3		BBB	
CTAS14C4	30711XAQ7	2M1	2.55	2.96		Baa2		BBB	
CTAS15C1	30711XAS3	1M1	2.15	2.66	BBB-			BBB	
CTAS15C1	30711XAU8	2M1	2.8	3.4	BBB			BBB	
CTAS15C2	30711XAW4	1M1	2.75	3.07	BBB-	A3			
CTAS15C2	30711XAY0	2M1	2.85	3.14	BBB-	Baa1			
CTAS15C3	30711XBA1	1M1	2.8	2.93	BBB-	A3			
CTAS15C3	30711XBC7	2M1	2.9	3.02	BBB-	Baa1			
CTAS15C4	30711XBE3	1M1	3.05	3.05	BBB			BBB	
CTAS15C4	30711XBG8	2M1	3.1	3.1	BBB			BBB	
ST15DNA1	3137G0EQ8	M1	3.25	3.45	AA-	A3			
ST15DNA2	3137G0FQ7	M1	4.5	4.73		A3			A
ST15DNA3	3137G0GQ6	M1	4.85	4.85	A-			A(high)	
ST15HQA1	3137G0GC7	M1	4.95	4.95	A-				A-
STCR13D1	3137G0AA7	M1	1.65	2.03					
STCR13D2	3137G0AC3	M1	1.95	2.28	BBB-	Baa1			
STCR14D1	3137G0AK5	M1	3.5	4.06		A1			A
STCR14D2	3137G0AW9	M1	3.5	4.33	A				A
STCR14D3	3137G0BH1	M1	3.6	4.99	A-	A1			
STCR14D4	3137G0CS6	M1	4.2	5.62	A-	A1			
STCR14H1	3137G0BU2	M1	4.1	5.42	A-	A2			
STCR14H2	3137G0CF4	M1	4.1	4.75	A-	A2			
STCR14H3	3137G0DD8	M1	4.75	5.99	A-	A1			
STCR15D1	3137G0DQ9	M1	3.5	4.35		A2		A	
STCR15H1	3137G0EC9	M1	4.75	5.34		A1			A-
STCR15H2	3137G0FC8	M1	4.1	4.36	A	A2			

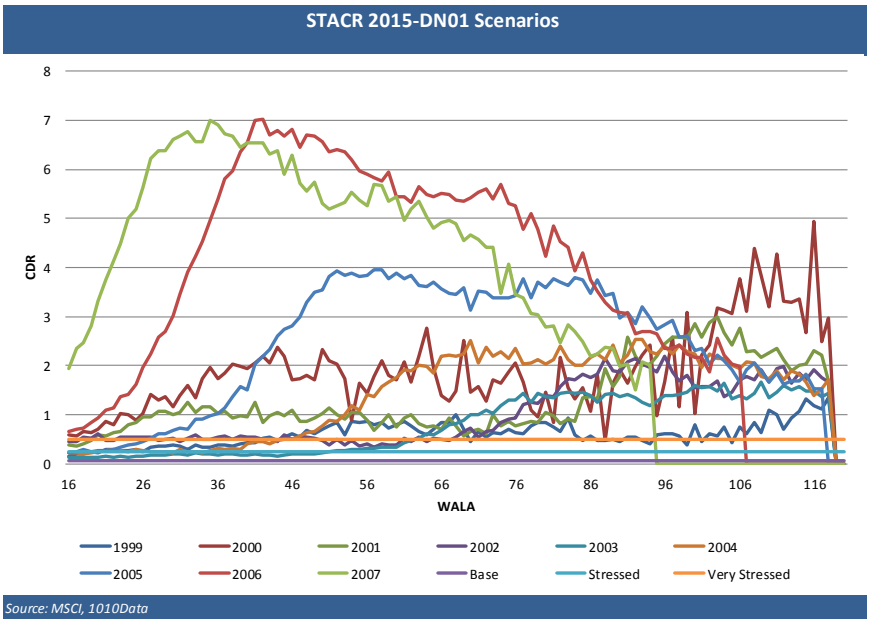
Source: MSCI, Intex

RISK SCENARIO ANALYSIS IN TODAY'S MARKET

Mortgages originated after 2010 benefit from tighter underwriting standards, improved borrowers' profiles and the recovery in housing prices. To understand the possible performance of CRT notes in distressed and extreme scenarios, we stress tested them, using historical cohorts with similar attributes as a proxy and Constant Default Rate from the turbulent market period from 1999 to 2007.

We ran baseline, stressed and very stressed scenarios, as discussed in the section on valuation (Stress Testing with Risk Manager — ST), using GSE single family mortgages from 1999 and 2007. For each vintage, we generated four cohorts with characteristics that were similar, respectively, to those of STACR/CAS low/high LTV deals. We used historical CDR as shown in Exhibit 14 and 10% CPR as the collateral assumptions in these scenarios.

Exhibit 14: Historical CDR of GSE Cohorts with Similar Loan Characteristics by Different Vintages



Source: MSCI, 1010Data

Based on historical severity statistics by Freddie Mac[2] and scheduled deal-embedded severity, we used 25% severity for deals with LTV between 60% to 80% and 15% severity for deals with LTV between 80% and 95%, in order to estimate the original attachment level for M1 tranche, as shown in Exhibits 15 to 18.

[2] http://www.freddiemac.com/creditriskofferings/docs/STACR_2015_DNA3_Roadshow.pdf

Exhibit 15: Attach Level of STACR Low LTV Series M1

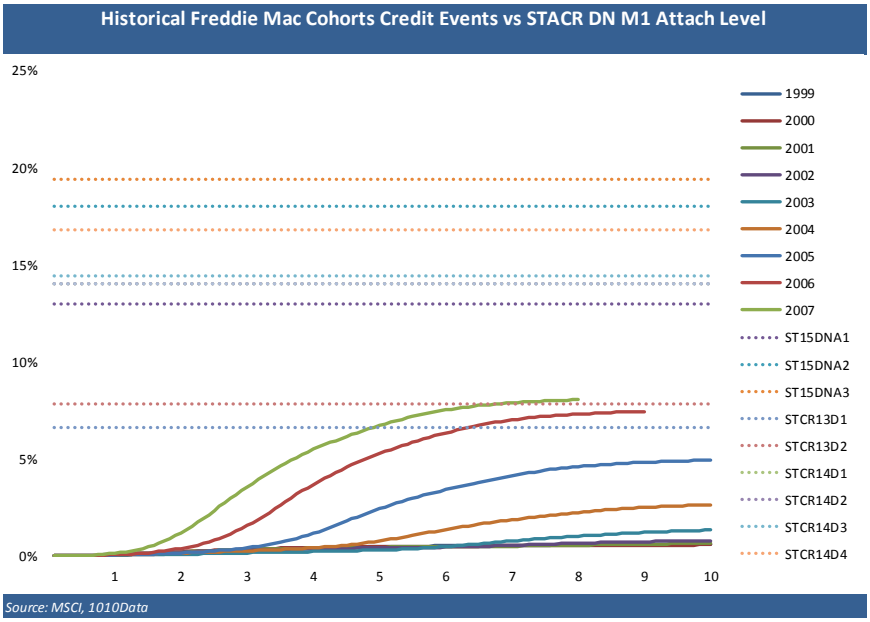
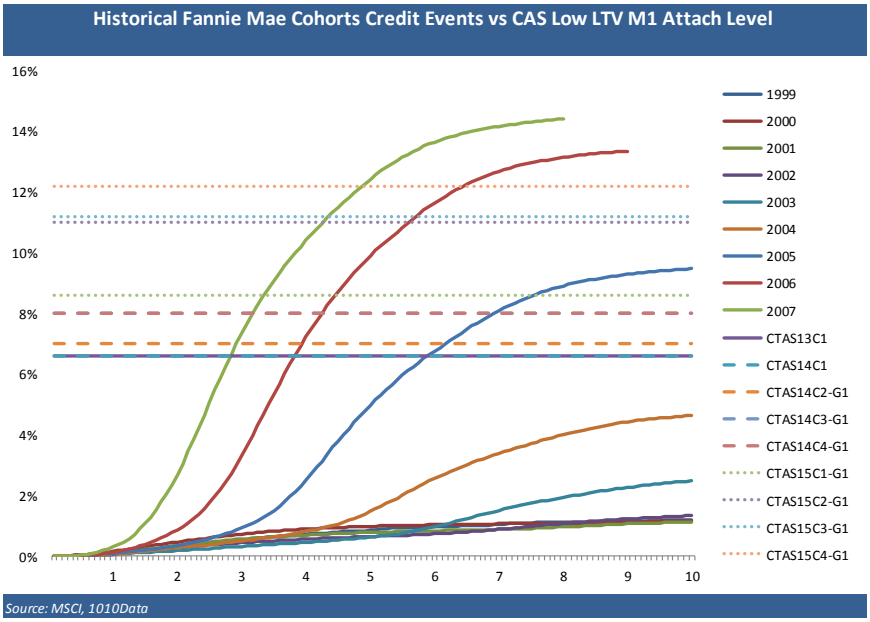


Exhibit 16: Attach Level of CAS Low LTV Group M1



For the high LTV group:

Exhibit 17: Attach Level of STACR High LTV M1

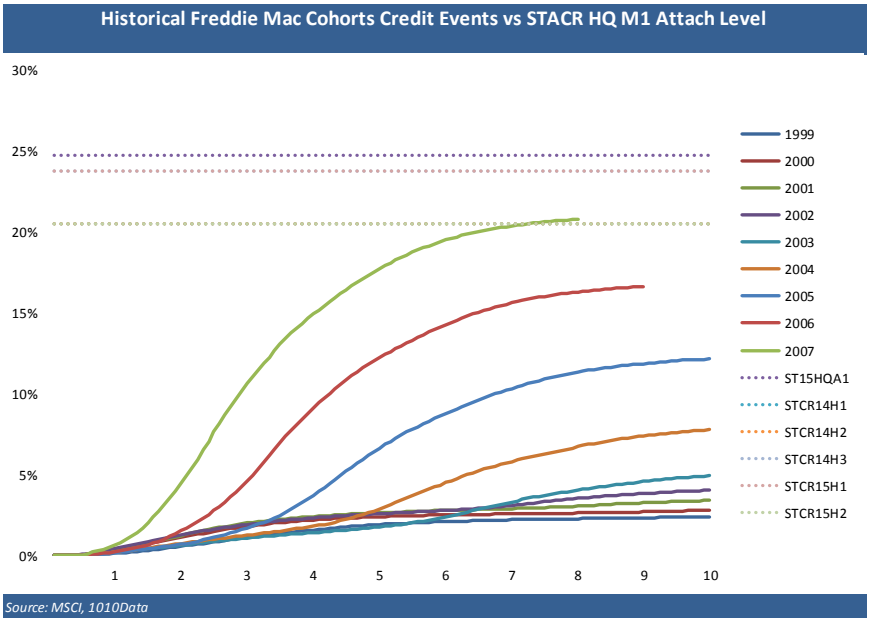
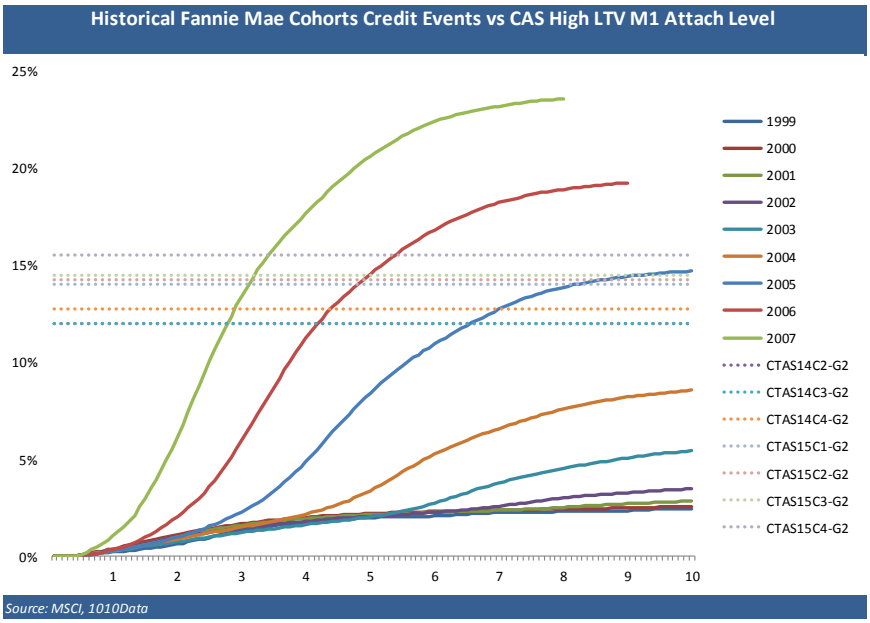


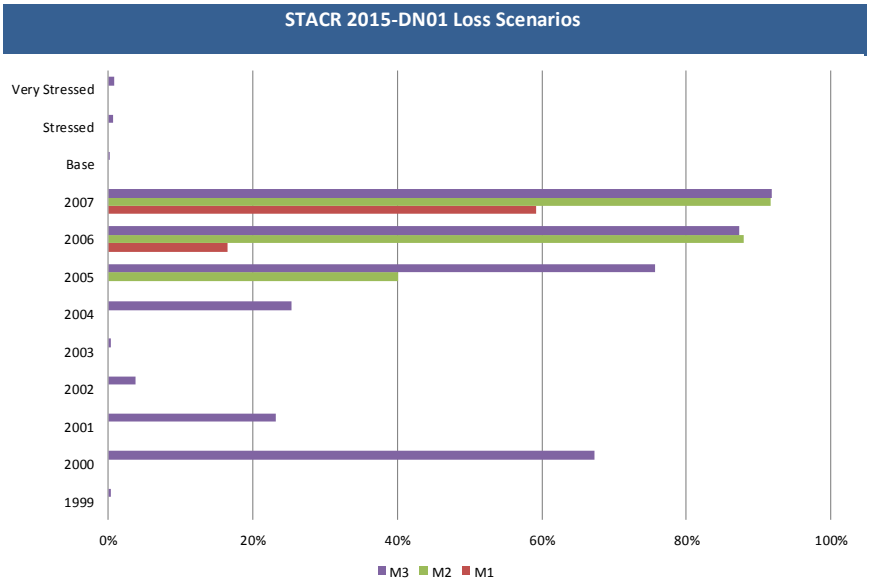
Exhibit 18: Attach Level of CAS High LTV Group M1



At the end of the first quarter of 2016, STACR and CAS M1 tranches were not experiencing any losses, according to 1010Data. The stress test indicated that no M1 tranches would suffer losses if subjected to the credit event experience from the 1999 through 2003 vintages. Under a scenario designed to mimic another housing bubble and a crisis like those experienced by the 2005 to 2007 vintages, M1 still did not show any losses. However, M2 and M3 proved to be at risk of losses under such a scenario. STACR B tranches also would have suffered a significant amount of write-downs.

However, both LCF and MCF suffered significant losses under the 2007 scenario when CDR ramped up quickly to 7%. We tested this knowing that mortgages now benefit from the current level of Home Price Appreciation (HPA), the HPA consensus, tranche credit support, delinquent pipeline and the fundamentals of the underlying collateral.

Exhibit 19: STACR 2015-DN01 Loss Analysis



Source: MSCI, Risk Manager, Reuters (Note: This is estimated by PV change while anchoring spread)

M1 had no write-downs in all stress test scenarios; M2 started to pick up losses under 2005, 2006 and 2007 scenarios; M3 had some losses under most scenarios, but these were still very small under all of our scenarios. LCF and MCF would suffer significant losses if another crisis occurs down the road, but they are unlikely to experience a default rate ramping up quickly to 7% CDR, as in 2006 and 2007, given the current level of HPA, HPA consensus, tranche credit support, delinquent pipeline and the fundamentals of the collateral.

RELATIVE VALUE OF THE STRESSED CRT POOLS

CRTs have become a common choice among investors seeking risk exposure to residential credit, in part because of the muted issuance of RMBS 2.0. CRT notes are also generally more liquid than most other structured credit products. At current prices, CRTs offer competitive yield with reasonable risk among credit products with a median investment grade. In the BBB-rated group, CRTs have a risk profile similar to Resecuritizations of Real Estate Mortgage Investment Conduits (Re-Remic) senior class.

Within CRTs, STACR FCFs are generally rated one grade higher than CAS and are traded slightly tighter. Exhibit 20 shows spreads of BBB tranches and other structured products as of November 2015.

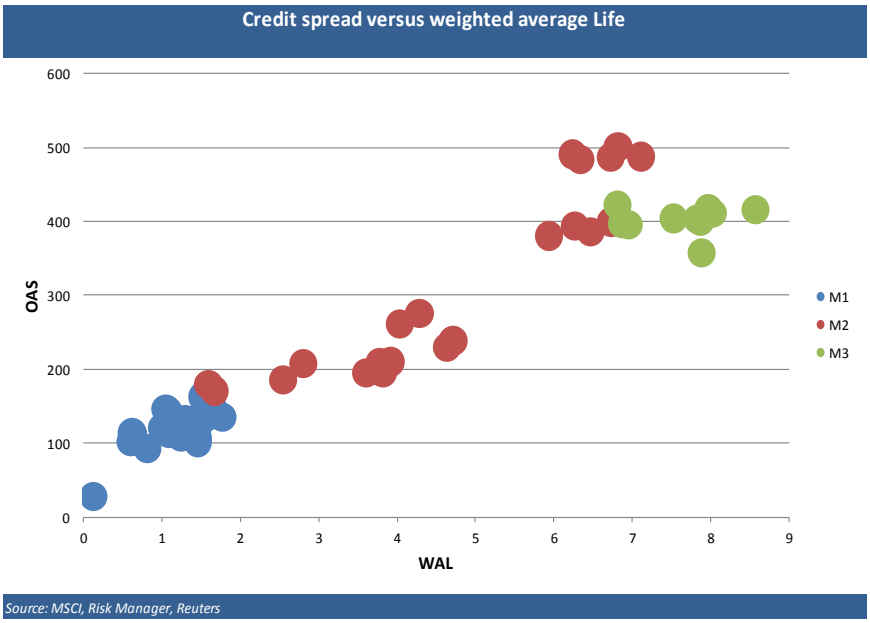
Exhibit 20: Spreads of BBB Tranches are Comparable to Other Structured Products

Indicative spread and WAL with BBB rating			
Asset	Spread	WAL	YTM
SFR D	245	3.6	3.89
Re-Remic SSNR	165	3.2	3.14
CLO 1.0	310	3.3	3.86
CLO 2.0	420	4.3	5.47
CMBS 1.0	170	1.5	2.65
CMBS 2.0	258	3.6	4.02
Prime Auto	136	3.2	2.45
Subprime Auto	177	3.8	3.05
Equipment ABS	138	3.5	2.56
Credit Card	120	4.5	1.24
STACR 2013-DN1 M1	101	1.5	2.05
STACR 2014-DN1 M2	195	3.6	3.43
STACR 2014-HQ1 M2	208	3.8	3.58
STACR 2015-HQ1 M2	210	3.9	3.61
STACR 2015-DNA1 M2	195	3.8	3.43
STACR 2015-HQA1 M2	275	4.3	4.53
CAS 2013-C01 M1	133	1.5	2.41
CAS 2014-C02 1M1	162	1.5	2.7
CAS 2014-C02 2M1	147	1.1	2.39

Source: MSCI, Risk Manager, Reuters

The following two exhibits show Option Adjusted Spread (OAS) by different Weighted Average Life (WAL) and indicative yield and spread by different tranches.

Exhibit 21: Credit Spread versus Weighted Average Life



Source: MSCI, Risk Manager, Reuters

Exhibit 22: Indicative Yield, Spread and Weighted Average Life

		FCF			MCF			LCF			FLP		
		WAL	Spread	YTM	WAL	Spread	YTM	WAL	Spread	YTM	WAL	Spread	YTM
STACR	2013-DN1	1.5	101	2.05				6.3	433	6.15			
	2013-DN2	1.1	143	2.32				5.9	380	5.64			
	2014-DN1	0.8	93	1.70	3.6	195	3.43	7.9	401	6.01			
	2014-DN2	0.6	102	1.71	3.2	211	3.51	7.8	403	6.04			
	2014-DN3	0.1	82	1.25	1.7	171	2.81	7.0	395	5.89			
	2014-DN4	0.1	27	0.71	1.6	179	2.86	6.9	397	5.90			
	2014-HQ1	1.0	121	2.07	3.8	209	3.58	8.0	411	6.14			
	2014-HQ2	1.2	108	2.04	4.6	230	3.93	8.6	416	6.23			
	2014-HQ3	0.6	114	1.84	2.8	207	3.39	7.5	404	6.02			
	2015-DN1	0.6	108	1.78	2.5	186	3.10	6.8	422	6.14	9.0	833	10.48
	2015-DNA1	1.5	107	2.04	3.8	195	3.43	7.9	357	5.59	11.5	660	8.84
	2015-DNA2	1.1	122	2.07	4.0	260	4.15	8.4	458	6.61	11.7	732	9.61
	2015-HQ1	1.1	113	2.03	3.9	210	3.61	8.0	418	6.20	9.2	781	9.96
	2015-HQA1	1.3	131	2.21	4.3	276	4.35	10.0	469	6.83	11.5	807	10.38
	2015-HQ2	1.4	144	2.42	4.7	238	4.03	8.9	423	6.31	9.2	744	9.60
CAS	2013-C01	1.5	133	2.41				6.5	386	5.73			
	2014-C01	1.6	150	2.61				6.7	399	5.90			
	2014-C02	1.5	163	2.70				6.7	487	6.82			
	2014-C03	1.1	141	2.30				6.2	491	6.82			
	2014-C04	1.0	146	2.34				6.3	394	5.82			
	2015-C01	1.1	131	2.21				6.3	483	6.75			
	2015-C02	1.3	150	2.48				6.8	501	6.98			
	2015-C03	1.8	135	2.42				7.1	488	6.85			

Source: MSCI, Risk Manager, Reuters

STRESS TESTING WITH THE RISKMANAGER – ST MODEL

CRTs are supported in RiskManager by the Structured Tranche (ST) model. Based on market conventions and the historical performance since origination of the collateral in the reference pool, the model uses the following default assumptions as baseline scenarios. Of course, users may define their own stress test scenario assumptions.

Exhibit 23: Static Fallback Assumptions

Scenario	CPR	CDR	CDR (High LTV)	Loss Severity
Base Case	10	0.05	0.10	20
Stressed	6	0.25	0.5	25
Very Stressed	5	0.5	1	40

Source: MSCI, 1010Data

To evaluate a CRT note, the user needs to provide its CUSIP, along with either the spread or price as a quote. A sample result from RiskManager appears on the next page, which shows basic risk measures such as yield to mature (YTM), credit spread, duration and convexity.

Exhibit 24: Sample Results

MSCI | RISKMETRICS RISKMANAGER

Report Name	CRT Risk Report
As-Of Date	11/30/2015

Name	WAL	YTM	Credit Spread	DV01	Duration	Modified Duration	Effective Spread Duration	Effective Convexity	VaR MC 95	VaR MC 99	VaR Hist 95	VaR Hist 99
CAS 2013-C01 M1	1.5	2.56	147.89	-8	0.07	1.49	1.50	-0.05	0.04	0.06	0.03	0.08
CAS 2013-C01 M2	6.5	5.74	387.14	-28	0.26	5.25	5.27	-0.04	0.13	0.21	0.11	0.28
CAS 2014-C01 M1	1.6	2.62	151.12	-7	0.07	1.59	1.59	-0.05	0.04	0.06	0.03	0.08
CAS 2014-C01 M2	6.7	5.91	400.28	-12	0.11	5.51	5.53	-0.05	0.14	0.22	0.11	0.29
CAS 2014-C02 1M1	1.5	2.70	163.34	-6	0.06	1.48	1.48	-0.05	0.04	0.06	0.03	0.08
CAS 2014-C02 1M2	6.7	6.85	486.57	36	-0.41	5.67	5.70	-0.08	0.17	0.23	0.13	0.28
CAS 2014-C02 2M1	1.1	2.42	149.64	-7	0.07	1.09	1.10	-0.05	0.03	0.04	0.02	0.06
CAS 2014-C02 2M2	5.9	6.11	424.55	20	-0.22	5.04	5.06	-0.07	0.13	0.20	0.11	0.25
CAS 2014-C03 1M1	1.1	2.33	141.69	-7	0.07	1.07	1.07	-0.05	0.03	0.04	0.02	0.06
CAS 2014-C03 1M2	6.2	6.86	491.15	26	-0.29	5.21	5.23	-0.07	0.15	0.21	0.11	0.26
CAS 2014-C03 2M1	1.2	2.41	147.15	-7	0.07	1.13	1.14	-0.05	0.03	0.05	0.02	0.06
CAS 2014-C03 2M2	6.0	5.94	406.95	14	-0.15	5.11	5.13	-0.06	0.13	0.21	0.11	0.26
CAS 2014-C04 1M1	1.0	2.75	184.96	-8	0.07	1.03	1.03	-0.05	0.03	0.04	0.02	0.05
CAS 2014-C04 1M2	6.3	5.84	394.99	-21	0.19	5.10	5.11	-0.04	0.13	0.20	0.11	0.27
CAS 2014-C04 2M1	0.9	2.31	145.11	-8	0.08	0.93	0.93	-0.05	0.02	0.04	0.02	0.05
CAS 2014-C04 2M2	5.7	5.76	392.46	-21	0.19	4.74	4.74	-0.04	0.12	0.19	0.10	0.25
CAS 2015-C01 1M1	1.1	2.24	132.64	-8	0.07	1.09	1.09	-0.05	0.03	0.04	0.02	0.06
CAS 2015-C01 1M2	6.3	6.79	484.00	4	-0.05	5.14	5.15	-0.06	0.13	0.21	0.11	0.26
CAS 2015-C01 2M1	0.4	1.90	121.15	-8	0.08	0.43	0.43	-0.05	0.01	0.02	0.01	0.02
CAS 2015-C01 2M2	5.0	5.83	403.31	-12	0.11	4.16	4.16	-0.04	0.10	0.17	0.08	0.22
CAS 2015-C02 1M1	1.3	2.44	147.09	-7	0.06	1.25	1.26	-0.05	0.03	0.05	0.03	0.07
CAS 2015-C02 1M2	6.8	6.98	498.74	13	-0.15	5.47	5.49	-0.06	0.13	0.22	0.12	0.27
CAS 2015-C02 2M1	1.6	2.49	139.91	-7	0.06	1.58	1.59	-0.05	0.04	0.06	0.03	0.08
CAS 2015-C03 1M1	1.8	2.42	135.93	-7	0.06	1.73	1.73	-0.05	0.04	0.07	0.04	0.09
CAS 2015-C03 1M2	7.1	6.89	488.67	-7	0.06	5.57	5.59	-0.05	0.14	0.22	0.11	0.29
CAS 2015-C03 2M1	2.0	2.67	151.62	-6	0.06	1.97	1.97	-0.05	0.05	0.08	0.04	0.10
CAS 2015-C03 2M2	7.2	7.27	524.35	0	0.00	5.60	5.63	-0.05	0.14	0.23	0.12	0.29
CAS 2015-C04 1M1	2.4	2.78	157.59	-6	0.06	2.27	2.28	-0.05	0.06	0.09	0.05	0.12
CAS 2015-C04 2M1	2.3	2.88	167.59	-6	0.06	2.25	2.26	-0.05	0.06	0.09	0.05	0.12
STACR 2013-DN1 M1	1.5	2.64	158.92	-10	0.09	1.41	1.41	-0.05	0.04	0.06	0.03	0.07
STACR 2013-DN1 M2	6.3	6.22	435.68	-50	0.43	4.93	4.95	-0.02	0.14	0.20	0.11	0.27
STACR 2013-DN2 M1	1.1	2.35	144.81	-8	0.07	1.06	1.07	-0.05	0.03	0.04	0.02	0.06
STACR 2013-DN2 M2	5.9	5.65	381.25	-11	0.10	4.97	4.98	-0.05	0.12	0.20	0.10	0.26
STACR 2014-DN1 M1	0.8	1.91	111.14	-8	0.07	0.80	0.80	-0.05	0.02	0.03	0.02	0.04
STACR 2014-DN1 M2	3.6	3.54	208.55	-6	0.05	3.36	3.37	-0.05	0.09	0.13	0.07	0.17
STACR 2014-DN1 M3	7.9	6.02	401.78	-15	0.14	6.25	6.29	-0.04	0.16	0.25	0.13	0.33
STACR 2014-DN2 M1	0.6	1.68	95.44	-8	0.08	0.60	0.60	-0.05	0.01	0.02	0.01	0.03
STACR 2014-DN2 M2	3.2	3.47	207.85	-3	0.03	2.99	3.00	-0.05	0.08	0.12	0.06	0.15
STACR 2014-DN2 M3	7.8	6.02	400.65	6	-0.06	6.37	6.41	-0.06	0.16	0.26	0.13	0.32
STACR 2014-DN3 M1	0.1	1.57	110.12	-8	0.08	0.10	0.10	-0.05	0.00	0.00	0.00	0.01
STACR 2014-DN3 M2	1.7	2.83	172.21	-8	0.08	1.61	1.62	-0.05	0.04	0.06	0.03	0.08
STACR 2014-DN3 M3	7.0	5.89	395.59	-5	0.04	5.70	5.72	-0.05	0.15	0.23	0.12	0.29
STACR 2014-DN4 M1	0.1	0.90	39.48	-9	0.08	0.12	0.12	-0.05	0.00	0.00	0.00	0.01
STACR 2014-DN4 M2	1.6	2.88	180.97	-8	0.07	1.54	1.55	-0.05	0.04	0.06	0.03	0.08
STACR 2014-DN4 M3	6.9	5.91	398.27	-15	0.14	5.56	5.58	-0.04	0.14	0.22	0.11	0.29
STACR 2014-HQ1 M1	1.0	2.12	124.27	-8	0.07	0.99	0.99	-0.05	0.02	0.04	0.02	0.05
STACR 2014-HQ1 M2	3.8	3.75	228.13	-7	0.06	3.50	3.51	-0.05	0.09	0.14	0.07	0.18
STACR 2014-HQ1 M3	8.0	6.15	411.88	-3	0.03	6.40	6.43	-0.05	0.17	0.26	0.13	0.33
STACR 2014-HQ2 M1	1.2	2.06	109.49	-8	0.07	1.22	1.22	-0.05	0.03	0.05	0.02	0.06
STACR 2014-HQ2 M2	4.6	3.90	230.15	-3	0.03	4.24	4.25	-0.05	0.11	0.17	0.09	0.22
STACR 2014-HQ2 M3	8.6	6.24	416.07	7	-0.08	6.81	6.85	-0.06	0.17	0.28	0.14	0.35
STACR 2014-HQ3 M1	0.6	1.90	116.75	-8	0.08	0.61	0.61	-0.05	0.02	0.02	0.01	0.03
STACR 2014-HQ3 M2	2.8	3.39	208.40	-8	0.08	2.64	2.65	-0.05	0.07	0.11	0.05	0.14
STACR 2014-HQ3 M3	7.5	6.03	404.95	-19	0.18	5.98	6.01	-0.04	0.15	0.24	0.12	0.31
STACR 2015-DN1 B	9.0	10.72	834.96	-72	0.61	5.61	5.65	-0.01	0.16	0.24	0.13	0.31
STACR 2015-DN1 M1	0.6	1.96	122.31	-8	0.08	0.62	0.62	-0.05	0.02	0.02	0.01	0.03
STACR 2015-DN1 M2	2.5	3.24	200.91	-7	0.07	2.38	2.39	-0.05	0.06	0.10	0.05	0.12
STACR 2015-DN1 M3	6.8	6.12	419.35	-3	0.03	5.54	5.57	-0.05	0.14	0.22	0.11	0.28
STACR 2015-DNA1 B	11.5	9.01	662.65	-82	0.70	7.00	7.02	0.01	0.19	0.29	0.16	0.39
STACR 2015-DNA1 M1	1.5	2.15	118.45	-7	0.06	1.43	1.43	-0.05	0.04	0.06	0.03	0.07
STACR 2015-DNA1 M2	3.8	3.60	213.30	-3	0.02	3.58	3.59	-0.05	0.09	0.14	0.07	0.18
STACR 2015-DNA1 M3	7.9	5.58	357.84	3	-0.04	6.46	6.49	-0.06	0.16	0.26	0.13	0.33
STACR 2015-DNA2 B	11.7	9.80	734.37	-3	0.03	7.15	7.19	-0.05	0.18	0.29	0.15	0.37
STACR 2015-DNA2 M1	1.1	2.10	124.00	-8	0.07	1.06	1.07	-0.05	0.03	0.04	0.02	0.06
STACR 2015-DNA2 M2	4.0	4.16	261.87	-5	0.04	3.69	3.71	-0.05	0.09	0.15	0.08	0.19
STACR 2015-DNA2 M3	8.3	6.67	458.99	13	-0.14	6.59	6.63	-0.06	0.16	0.27	0.14	0.33
STACR 2015-HQ1 B	9.2	10.16	782.60	-70	0.60	5.79	5.84	-0.01	0.16	0.24	0.13	0.32
STACR 2015-HQ1 M1	1.1	2.14	123.61	-7	0.07	1.06	1.06	-0.05	0.03	0.04	0.02	0.06
STACR 2015-HQ1 M2	3.9	3.78	228.99	-4	0.04	3.60	3.62	-0.05	0.09	0.14	0.07	0.19
STACR 2015-HQ1 M3	7.9	6.18	415.33	5	-0.05	6.38	6.42	-0.06	0.16	0.26	0.13	0.33
STACR 2015-HQ2 B	9.2	9.78	744.06	-7	0.07	6.20	6.25	-0.05	0.16	0.25	0.13	0.32
STACR 2015-HQ2 M1	1.4	2.38	140.09	-7	0.06	1.34	1.35	-0.05	0.03	0.05	0.03	0.07
STACR 2015-HQ2 M2	4.7	3.97	235.29	0	-0.01	4.30	4.31	-0.05	0.11	0.17	0.09	0.22
STACR 2015-HQ2 M3	8.9	6.33	421.33	24	-0.26	7.11	7.15	-0.07	0.18	0.29	0.15	0.36
STACR 2015-HQA1 B	11.5	10.62	809.69	2	-0.03	6.82	6.84	-0.05	0.17	0.27	0.14	0.35
STACR 2015-HQA1 M1	1.3	2.24	133.12	-7	0.07	1.28	1.29	-0.05	0.03	0.05	0.03	0.07
STACR 2015-HQA1 M2	4.3	4.32	274.13	-4	0.03	3.89	3.90	-0.05	0.10	0.16	0.08	0.20
STACR 2015-HQA1 M3	10.0	6.86	466.02	-5	0.05	7.29	7.32	-0.05	0.19	0.29	0.15	0.38

Source: MSCI, Risk Manager

CONCLUSION

Credit risk transfer transactions (CRTs) have drawn increased attention from institutional investors since their launch in 2013. However, as with any structured fixed-income investment, portfolio managers and risk managers need to perform an in-depth collateral analysis along with scenario/stress testing before investing in these newer securities.

In the first two months of 2016, the fixed income market as a whole (and particularly the high-yield and some structured product markets) was highly volatile, and such volatility could spill over to the CRT market. As we have shown in this paper, MSCI's RiskManager can be helpful in monitoring the potential risks and returns of these relative newcomers to the fixed-income marketplace.

RiskManager's flexibility makes it usable for stress tests based on historical, present or projected scenarios affecting any segment of a multi-asset class portfolio.

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