

# Rating Transitions & Cumulative Default Rates - 2016

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**JCR-VIS** Credit Rating Co. Ltd.

- Rating Transition & Cumulative Default Rate Study uses data from JCR-VIS rating database;
- Rating Transition Study and Cumulative Default Rate Study include ratings conducted from January 1, 2007 to December 31, 2016;
- Only 'Medium to Long term' ratings on JCR-VIS' Issue/Issuer Rating Scale are used;
- Ratings at Issuer level are used; In case of multiple instrument ratings by an issuer, long term instrument rating taken as the issuer's rating. In case of subordinated or other structures, rating of the senior most debt is taken.
- Ratings of Structured Obligations are not included in both studies due to limited number of ratings;
- Cumulative Transition and Default Rates are expressed in Percentage Terms
- The above methodology is consistent with the methodology proposed to be implemented at the level of ACRAA.

## DETAILS OF DATA SETS

- Rating Transitions are calculated for Periods: 1 year, 2 years, 3 years and 5 years since Jan. 1, 2007;
- Rating Transitions are calculated for All Rating Categories including Modifier Levels (+/-);
- Rating Transitions Matrix for Each Period is developed using Static Pool Method;
- Ratings at the Beginning-of-the-period are displayed on the Y (Vertical) Axis of the Matrix;
- An Accumulated Migration Percentage of Rating Category at the End-of-the-period is depicted on the X (Horizontal) Axis;

## RATING TRANSITIONS DEFINITION

Rating Counts	End-of-Year Rating																			
	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
4 AAA	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 AA+	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 AA	2	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 AA-	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 A+	0	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 A	0	0	0	0	0	12	1	0	0	0	0	0	0	0	0	0	0	0	0	2
22 A-	0	0	0	0	0	1	15	3	0	0	0	0	0	0	0	0	0	0	1	2
10 BBB+	0	0	0	0	0	0	2	6	0	0	0	0	0	0	0	0	0	0	0	2
11 BBB	0	0	0	0	0	0	0	1	8	0	0	1	0	0	0	0	0	0	0	1
2 BBB-	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0 BB+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 BB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 BB-	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0 B+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 CCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# RATING TRANSITIONS 2010

Rating Counts	End-of-Year Rating																			
	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
7 AAA	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 AA+	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 AA	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 AA-	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 A+	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 A	0	0	0	0	3	11	0	0	0	0	0	1	0	0	0	0	0	0	0	1
14 A-	0	0	0	0	0	5	7	1	1	0	0	0	0	0	0	0	0	0	0	0
8 BBB+	0	0	0	0	0	1	0	6	1	0	0	0	0	0	0	0	0	0	0	0
8 BBB	0	0	0	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0	0	1
1 BBB-	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0 BB+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 BB	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1 BB-	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
0 B+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 CCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# RATING TRANSITIONS 2011

# RATING TRANSITIONS 2012

Rating Counts	End-of-Year Rating																			
	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
6 AAA	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 AA+	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 AA	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 AA-	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 A+	0	0	0	1	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 A	0	0	0	0	0	14	3	0	0	0	0	0	0	0	0	0	0	0	0	0
8 A-	0	0	0	0	0	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0
7 BBB+	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	1
5 BBB	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0
1 BBB-	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
1 BB+	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
0 BB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 BB-	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1 B+	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0 B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 CCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Rating Counts	End-of-Year Rating																			
	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
7 AAA	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 AA+	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 AA	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 AA-	0	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 A+	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 A	0	0	0	0	4	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 A-	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0
8 BBB+	0	0	0	0	0	0	2	6	0	0	0	0	0	0	0	0	0	0	0	0
2 BBB	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
2 BBB-	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
2 BB+	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
0 BB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 BB-	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1 B+	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 CCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# RATING TRANSITIONS 2013

# RATING TRANSITIONS 2014

Rating Counts	End-of-Year Rating																			
	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
4 AAA	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 AA+	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 AA	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 AA-	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 A+	0	0	4	0	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
15 A	1	0	0	0	5	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0
9 A-	0	0	0	0	0	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0
9 BBB+	0	0	0	0	0	0	5	4	0	0	0	0	0	0	0	0	0	0	0	0
2 BBB	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
0 BBB-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 BB+	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
0 BB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 BB-	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0 B+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 CCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Rating Counts	End-of-Year Rating																			
	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
4 AAA	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 AA+	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 AA	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 AA-	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 A+	0	0	0	0	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 A	0	0	0	0	1	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0
12 A-	0	0	0	0	0	0	10	1	0	1	0	0	0	0	0	0	0	0	0	0
5 BBB+	0	0	0	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0
3 BBB	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
0 BBB-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 BB+	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0 BB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 BB-	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0 B+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 CCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# RATING TRANSITIONS 2015

Rating Counts	End-of-Year Rating																			
	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
5 AAA	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 AA+	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 AA	0	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 AA-	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 A+	0	0	0	0	9	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11 A	0	0	0	0	2	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0
10 A-	0	0	0	0	0	3	7	0	0	0	0	0	0	0	0	0	0	0	0	0
4 BBB+	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
3 BBB	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
0 BBB-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 BB+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 BB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 BB-	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0
0 B+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 CCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# RATING TRANSITIONS 2016

<b>Year</b>	<b>Upgrades</b>	<b>Downgrades</b>	<b>No Change</b>
2010	8	23	94
2011	17	8	73
2012	13	14	85
2013	17	1	79
2014	24	5	75
2015	4	7	94
2016	8	7	56

**RATING  
ACTIONS**

**Transition Period: 1 Year**

Beginning-of-Period Rating	End-of-Period Rating																				
	%	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
AAA	98.0	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0	-	-	-	-	-	-
AA+	4.1	93.9	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA	2.5	5.1	92.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA-	-	-	8.8	87.7	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A+	-	-	4.9	6.1	80.5	6.1	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A	0.8	-	-	-	12.2	76.3	6.9	1.5	-	-	-	0.8	-	-	-	-	-	-	-	-	1.5
A-	-	-	-	-	1.6	10.2	75.0	7.0	0.8	2.3	-	-	-	-	-	-	0.8	-	0.8	-	1.6
BBB+	-	-	-	-	-	1.5	21.5	66.2	4.6	1.5	1.5	-	-	-	-	-	-	-	1.5	-	1.5
BBB	-	-	-	-	-	-	2.2	10.9	73.9	4.3	-	2.2	-	-	-	-	-	-	-	-	6.5
BBB-	-	-	-	-	-	-	-	11.1	22.2	33.3	33.3	-	-	-	-	-	-	-	-	-	-
BB+	-	-	-	-	-	-	-	11.1	22.2	-	44.4	-	22.2	-	-	-	-	-	-	-	-
BB	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-
BB-	-	-	-	-	-	-	-	-	-	-	11.1	11.1	66.7	-	11.1	-	-	-	-	-	-
B+	-	-	-	-	-	50.0	-	-	-	-	-	-	-	-	50.0	-	-	-	-	-	-
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-
B-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0

CUMULATIVE  
1 YEAR  
RATING  
TRANSITIONS

**Transition Period: 2 Years**

Beginning-of-Period Rating	End-of-Period Rating																				
	%	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
AAA	94.7	-	-	-	-	2.6	-	-	-	-	-	-	-	-	2.6	-	-	-	-	-	-
AA+	7.7	87.2	5.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA	4.7	12.5	82.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA-	-	-	24.0	70.0	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A+	-	-	4.9	14.8	60.7	11.5	3.3	-	-	1.6	-	1.6	-	-	-	-	-	-	-	-	1.6
A	0.9	-	-	0.9	23.1	59.3	10.2	3.7	0.9	-	-	-	-	-	-	-	-	-	0.9	-	-
A-	-	-	-	-	2.9	22.1	57.7	9.6	1.9	1.9	-	-	-	-	-	-	-	-	-	1.0	2.9
BBB+	-	-	-	-	-	1.7	33.9	54.2	3.4	3.4	-	1.7	-	-	-	-	-	-	-	-	1.7
BBB	-	-	-	-	-	-	2.6	15.4	64.1	5.1	2.6	-	2.6	-	-	-	-	2.6	-	-	5.1
BBB-	-	-	-	-	-	-	9.1	9.1	45.5	27.3	9.1	-	-	-	-	-	-	-	-	-	-
BB+	-	-	-	-	-	-	12.5	12.5	12.5	-	-	-	37.5	-	12.5	-	12.5	-	-	-	-
BB	-	-	-	-	-	-	-	-	-	-	-	50.0	50.0	-	-	-	-	-	-	-	-
BB-	-	-	-	-	-	-	-	-	-	-	33.3	-	66.7	-	-	-	-	-	-	-	-
B+	25.0	-	-	-	-	-	-	-	-	-	-	-	25.0	25.0	-	-	25.0	-	-	-	-
B	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-
B-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-
CCC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CUMULATIVE  
2 YEARS  
RATING  
TRANSITIONS

**Transition Period: 3 Years**

Beginning-of-Period Rating	End-of-Period Rating																				
	%	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
AAA	93.8	-	-	-	-	3.1	-	-	-	-	-	-	-	-	3.1	-	-	-	-	-	-
AA+	13.3	80.0	6.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA	8.5	21.3	70.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA-	-	-	40.0	52.5	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A+	-	-	6.7	28.9	44.4	13.3	-	-	-	2.2	-	2.2	-	-	-	-	-	-	-	-	2.2
A	1.1	-	-	2.1	35.8	45.3	6.3	3.2	-	-	1.1	1.1	-	-	-	-	-	-	1.1	-	3.2
A-	-	-	-	-	6.0	32.5	43.4	10.8	3.6	1.2	-	-	-	-	-	-	-	-	-	1.2	1.2
BBB+	-	-	-	-	-	6.5	39.1	43.5	6.5	-	2.2	-	2.2	-	-	-	-	-	-	-	-
BBB	-	-	-	-	-	-	9.4	25.0	53.1	3.1	3.1	-	3.1	-	-	-	-	-	-	-	3.1
BBB-	-	-	-	-	-	-	16.7	16.7	33.3	-	16.7	-	16.7	-	-	-	-	-	-	-	-
BB+	-	-	-	-	-	-	28.6	-	14.3	-	28.6	-	14.3	-	14.3	-	-	-	-	-	-
BB	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-
BB-	-	-	-	-	-	-	-	20.0	-	-	20.0	-	60.0	-	-	-	-	-	-	-	-
B+	33.3	-	-	-	-	-	-	-	-	-	-	33.3	-	-	-	-	-	33.3	-	-	-
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CUMULATIVE  
3 YEARS  
RATING  
TRANSITIONS

**Transition Period: 5 Years**

Beginning-of-Period Rating	End-of-Period Rating																				
	%	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC	CC	C	D
AAA	89.5	-	-	-	-	5.3	-	-	-	-	-	-	-	-	5.3	-	-	-	-	-	-
AA+	26.3	63.2	10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA	4.5	31.8	63.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AA-	-	9.1	40.9	40.9	9.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A+	-	-	22.2	25.9	22.2	22.2	-	3.7	-	-	-	3.7	-	-	-	-	-	-	-	-	-
A	-	-	2.1	6.4	44.7	29.8	12.8	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-
A-	-	-	-	-	19.0	44.8	20.7	6.9	1.7	1.7	3.4	-	-	-	-	-	-	-	-	-	1.7
BBB+	-	-	-	-	-	10.7	46.4	32.1	3.6	-	-	-	7.1	-	-	-	-	-	-	-	-
BBB	-	-	-	-	-	-	38.9	16.7	27.8	-	5.6	-	5.6	-	5.6	-	-	-	-	-	-
BBB-	-	-	-	-	-	-	20.0	20.0	60.0	-	-	-	-	-	-	-	-	-	-	-	-
BB+	-	-	-	-	-	-	25.0	50.0	-	-	25.0	-	-	-	-	-	-	-	-	-	-
BB	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-
BB-	-	-	-	-	-	-	66.7	-	-	-	-	-	33.3	-	-	-	-	-	-	-	-
B+	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CUMULATIVE  
5 YEARS  
RATING  
TRANSITIONS

**January 1, 2007 to December 31, 2016**

<b>Beginning-of-Period Rating Count for Transition Periods:</b>				
	<b>1 Year</b>	<b>2 Years</b>	<b>3 Years</b>	<b>5 Years</b>
<b>AAA</b>	49	38	32	19
<b>AA+</b>	49	39	30	19
<b>AA</b>	79	64	47	22
<b>AA-</b>	57	50	40	22
<b>A+</b>	82	61	45	27
<b>A</b>	131	108	95	47
<b>A-</b>	128	104	83	58
<b>BBB+</b>	65	59	46	28
<b>BBB</b>	46	39	32	18
<b>BBB-</b>	9	11	6	5
<b>BB+</b>	9	8	7	4
<b>BB</b>	1	2	1	1
<b>BB-</b>	9	6	5	3
<b>B+</b>	2	4	3	1
<b>B</b>	1	1	0	0
<b>B-</b>	0	1	0	0
<b>CCC</b>	1	0	0	0

**CUMULATIVE  
RATING  
TRANSITIONS  
DATA COUNT**



- Failure of an obligor to make timely payment of principal and/or interest under contractual terms of any financial obligation.
- A distressed restructuring whereby
  - lenders have diminished financial returns relative to the original obligation; and
  - the restructuring has the effect of allowing the obligor to avoid a bankruptcy or payment default.

Default is generally recognized after the expiry of grace period.

However, if JCR-VIS believes that the requisite payment will not be made in full by the due date (including the pre-specified grace period), then default may be recognized immediately.

## DEFINITION OF DEFAULT

- Groups of all Outstanding Ratings at the Beginning of Each Period are formed;
- These Groups are called Static Pools or Cohorts;
- Changes in a particular Static Pool are then Tracked till the End-of-the-period;
- Adjustment for Withdrawn or Discontinued Ratings: All such ratings which do not continue to Exist till the End-of-the-period are Excluded at the time of Static Pool Formation;
- New ratings that are conducted during the period of a Static Pool are included in Static Pools of subsequent Periods;
- Insurer Financial Strength (IFS) Ratings are not included.

## DETAILS OF STATIC POOLS

- Three-years Weighted Average Cumulative Default Rates (CDRs) are calculated using Static Pools of 2007, 2008, 2009, 2010, 2011, 2012, 2013 and 2014;
- Calculation Steps:
  - Create Withdrawal-adjusted Static Pools and Survivor Rate for each Period
  - Calculate Marginal Default Rates (MDRs) for each Period for every Static Pool separately;
  - Calculate Weighted Average of each MDR (wMDR) weighted for Size of each Static Pool
  - Calculate  $CDR = 1 - [(1-WMDR1)*(1-WMDR2)*(1-WMDR3)]$

## CUMULATIVE DEFAULT RATES

CATEGORY BASED	As at December 31		
	2014	2015	2016
<b>3-years Cumulative Default Rate (CDR3)</b>			
AAA	0.0%	0.0%	0.0%
AA	0.0%	0.0%	0.0%
A	9.8%	8.2%	5.2%
BBB	9.6%	8.4%	5.5%
<b>Investment Grade (AAA to BBB)</b>	<b>7.3%</b>	<b>6.1%</b>	<b>4.2%</b>
BB	17.5%	13.8%	2.0%
B	0.0%	0.0%	0.0%
CCC	0.0%	0.0%	0.0%
CC	0.0%	0.0%	0.0%
C	75.0%	77.8%	42.1%

## CUMULATIVE DEFAULT RATES

CUMULATIVE  
DEFAULT  
RATES  
DATA COUNTS

	2012		2013		2014	
	Ratings <sup>1</sup>	Withdrawals <sup>2</sup>	Ratings <sup>1</sup>	Withdrawals <sup>2</sup>	Ratings <sup>1</sup>	Withdrawals <sup>2</sup>
AAA	6	2	6	4	7	4
AA	12	4	14	7	13	7
A	35	6	36	7	32	8
BBB	19	6	17	4	13	3
<b>Investment Grade (AAA-BBB)</b>	<b>72</b>	<b>18</b>	<b>73</b>	<b>22</b>	<b>65</b>	<b>22</b>
BB	2	0	2	0	3	1
B	0	0	1	1	0	0
CCC	1	1	1	1	0	0
CC	0	0	0	0	0	0
C	1	0	1	0	0	0
<b>Total</b>	<b>76</b>	<b>19</b>	<b>78</b>	<b>24</b>	<b>68</b>	<b>23</b>

Notes:

1. Number of ratings outstanding at the beginning of each year
2. Number of rating withdrawals in the next 3 years