

## Moody's Investors Service ("MIS")

### Exhibit 1

# Credit Ratings Performance Measurement Statistics

Performance Measurement Statistics, consisting of transition and default rates for each applicable asset class and subclass of credit rating over 1-year, 3-year, and 10-year time periods through December 31, 2019, are provided in the Transition/Default Matrices on the following pages, pp. 1-25 (the "Matrices").<sup>1</sup> Please note that all the numbers in the Matrices are in percentage.

## Financial Institutions, Brokers and Dealers

### Financial Institutions, Brokers and Dealers - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																					Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	39	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%
Aa1	28	0%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%
Aa2	68	0%	0%	93%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%
Aa3	136	0%	0%	3%	92%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%
A1	292	0%	0%	0%	17%	79%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
A2	173	0%	0%	0%	0%	5%	82%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%
A3	192	0%	0%	0%	0%	0%	5%	93%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
Baa1	168	0%	0%	0%	0%	0%	1%	10%	85%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
Baa2	135	0%	0%	0%	0%	0%	1%	0%	11%	84%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Baa3	130	0%	0%	0%	0%	0%	0%	0%	1%	6%	83%	7%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%
Ba1	50	0%	0%	0%	0%	0%	0%	2%	0%	0%	18%	66%	4%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	6%
Ba2	64	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	14%	70%	3%	0%	2%	0%	0%	0%	0%	0%	0%	0%	5%	3%
Ba3	90	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%	13%	54%	7%	1%	0%	9%	0%	0%	0%	0%	0%	2%	7%
B1	57	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	11%	44%	18%	0%	2%	4%	0%	0%	0%	0%	0%	18%
B2	99	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	2%	12%	62%	11%	1%	7%	0%	0%	0%	0%	0%	4%
B3	52	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	15%	48%	4%	10%	0%	0%	0%	6%	4%	8%
Caa1	43	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	23%	53%	9%	0%	0%	0%	0%	5%	5%
Caa2	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	60%	7%	0%	0%	0%	0%	13%
Caa3	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	50%	0%	0%	25%	0%	0%
Ca	-																								
C	-																								
Total	1,835																								

<sup>1</sup> Ratings withdrawn for reasons other than having defaulted or been paid off are accounted for in the column titled "Withdrawn (other)."

## Financial Institutions, Brokers and Dealers - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	39	95%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	
Aa1	24	0%	75%	8%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	
Aa2	67	0%	3%	42%	39%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	
Aa3	106	0%	2%	22%	39%	24%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	6%	
A1	260	0%	0%	2%	32%	50%	7%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	2%	
A2	178	0%	0%	1%	2%	28%	43%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	
A3	183	0%	0%	0%	0%	2%	13%	63%	7%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	6%	
Baa1	163	0%	0%	0%	0%	2%	10%	23%	53%	2%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	5%	
Baa2	123	0%	0%	0%	0%	0%	3%	7%	21%	42%	12%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	5%	
Baa3	125	0%	0%	0%	0%	1%	1%	0%	3%	31%	45%	5%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	6%	6%	
Ba1	76	0%	0%	0%	0%	0%	0%	0%	4%	5%	32%	20%	5%	0%	4%	11%	4%	0%	0%	0%	0%	0%	0%	4%	12%	
Ba2	66	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	11%	45%	6%	0%	2%	6%	2%	0%	0%	0%	0%	2%	6%	15%	
Ba3	77	0%	0%	0%	0%	0%	0%	0%	0%	4%	3%	9%	10%	34%	4%	1%	5%	9%	0%	0%	0%	0%	4%	3%	14%	
B1	83	0%	0%	0%	0%	1%	0%	0%	0%	1%	2%	6%	6%	16%	10%	18%	7%	2%	2%	0%	0%	0%	0%	5%	23%	
B2	78	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	8%	19%	38%	3%	1%	1%	0%	0%	0%	5%	1%	21%	
B3	49	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	8%	18%	12%	8%	12%	0%	0%	0%	8%	2%	29%	
Caa1	45	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	7%	24%	13%	18%	0%	0%	0%	7%	11%	13%	
Caa2	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	47%	0%	0%	0%	0%	20%	7%	13%	
Caa3	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	57%	0%	14%	0%	0%	0%	29%	0%	
Ca	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	56%	0%	0%	0%	11%	11%	11%	
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	1,773	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

## Financial Institutions, Brokers and Dealers - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	88	38%	6%	10%	13%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	6%	
Aa1	133	0%	7%	8%	43%	7%	1%	7%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	10%	
Aa2	152	0%	0%	7%	9%	21%	5%	2%	6%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	19%	
Aa3	225	0%	0%	3%	16%	20%	7%	4%	4%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	14%	
A1	215	0%	0%	1%	4%	17%	16%	9%	4%	2%	4%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	14%	23%	
A2	209	0%	1%	3%	2%	9%	12%	17%	7%	2%	3%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	13%	22%	
A3	185	0%	0%	0%	0%	1%	7%	15%	9%	6%	3%	1%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%	16%	34%	
Baa1	116	0%	0%	0%	0%	0%	3%	13%	15%	5%	8%	3%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	3%	9%	39%	
Baa2	103	0%	0%	0%	0%	0%	0%	8%	13%	7%	17%	4%	9%	1%	1%	0%	3%	0%	0%	0%	0%	0%	5%	7%	27%	
Baa3	83	0%	0%	0%	0%	1%	0%	4%	6%	8%	10%	4%	5%	5%	0%	0%	2%	0%	0%	0%	0%	0%	4%	8%	43%	
Ba1	58	0%	0%	0%	0%	0%	0%	0%	2%	7%	14%	2%	5%	7%	5%	5%	2%	2%	2%	0%	0%	0%	2%	17%	29%	
Ba2	48	0%	0%	0%	0%	2%	0%	0%	0%	6%	2%	6%	8%	8%	4%	2%	13%	2%	2%	0%	0%	0%	6%	6%	31%	
Ba3	75	0%	0%	0%	0%	0%	0%	0%	0%	20%	4%	1%	5%	5%	8%	7%	3%	0%	3%	0%	0%	0%	5%	8%	31%	
B1	56	0%	0%	0%	0%	0%	0%	0%	0%	2%	7%	0%	2%	5%	2%	11%	14%	0%	0%	0%	0%	0%	11%	0%	46%	
B2	64	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	0%	5%	3%	14%	2%	9%	5%	0%	0%	0%	8%	6%	45%	
B3	81	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%	1%	0%	0%	4%	4%	7%	1%	0%	0%	0%	10%	2%	65%	
Caa1	28	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	21%	0%	0%	0%	14%	4%	50%	
Caa2	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%		
Caa3	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%		
Ca	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	44%	33%		
C	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	20%	60%		
Total	1,939																									

## Insurance Companies

### Insurance Companies - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	6	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa1	12	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa2	64	0%	0%	95%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa3	95	0%	0%	0%	97%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
A1	141	0%	0%	0%	2%	87%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%
A2	197	0%	0%	0%	0%	1%	97%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
A3	107	0%	0%	0%	0%	0%	3%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Baa1	75	0%	0%	0%	0%	0%	0%	8%	85%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
Baa2	71	0%	0%	0%	0%	0%	0%	1%	6%	90%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa3	34	0%	0%	0%	0%	0%	0%	0%	0%	6%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
Ba1	13	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	69%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%
Ba2	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	29%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	6%
Ba3	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	40%	7%	13%	0%	0%	0%	0%	0%	0%	0%	0%	33%
B1	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	43%	0%	0%	0%	0%	0%	0%	0%	43%
B2	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	14%	43%	0%	0%	0%	0%	0%	0%	29%
B3	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	50%	25%	0%	0%	0%	0%	0%	0%	0%
Caa1	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	67%	0%	0%	0%	0%	0%	0%	0%
Caa2	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	86%	0%	0%	0%	0%	0%	14%
Caa3	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%
Ca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	884																								

### Insurance Companies - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	6	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Aa1	12	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Aa2	63	0%	0%	94%	5%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Aa3	100	0%	0%	2%	87%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	
A1	129	0%	0%	0%	5%	76%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	
A2	190	0%	0%	0%	0%	9%	73%	9%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	7%	
A3	116	0%	0%	0%	0%	0%	28%	55%	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	7%	
Baa1	67	0%	0%	0%	0%	0%	4%	19%	61%	6%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	6%	
Baa2	80	0%	0%	0%	0%	0%	0%	5%	16%	56%	13%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	
Baa3	37	0%	0%	0%	0%	0%	0%	3%	8%	19%	35%	19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	11%	
Ba1	15	0%	0%	0%	0%	0%	0%	0%	0%	7%	27%	40%	7%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	
Ba2	8	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	13%	38%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	13%	0%	
Ba3	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	0%	6%	6%	29%	0%	0%	0%	0%	0%	0%	0%	6%	41%	
B1	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	70%	
B2	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	0%	0%	0%	0%	0%	0%	0%	40%	
B3	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	38%	0%	0%	0%	0%	0%	0%	50%	
Caa1	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	25%	25%	
Caa2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	33%	17%	
Caa3	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	
Ca	-																									
C																										
Total	879																									

## Insurance Companies - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	6	83%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa1	14	0%	79%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%
Aa2	72	0%	0%	61%	28%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%
Aa3	129	0%	0%	1%	30%	17%	13%	11%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	20%
A1	111	0%	0%	0%	9%	31%	16%	3%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	31%
A2	262	0%	0%	0%	8%	16%	32%	9%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	3%	30%
A3	101	1%	0%	0%	0%	1%	8%	23%	24%	9%	5%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	23%
Baa1	47	0%	0%	0%	0%	0%	17%	4%	36%	9%	6%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%	17%
Baa2	44	0%	0%	0%	0%	2%	0%	9%	16%	34%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	11%
Baa3	43	0%	0%	0%	0%	0%	7%	2%	16%	16%	12%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%	0%	0%	16%	26%
Ba1	16	0%	0%	0%	6%	0%	0%	0%	0%	13%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	63%
Ba2	11	0%	0%	0%	0%	0%	0%	27%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%
Ba3	22	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	5%	0%	5%	0%	18%	0%	0%	0%	0%	0%	0%	0%	18%	50%
B1	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	89%
B2	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	36%	0%	0%	0%	0%	0%	0%	0%	57%
B3	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	12%	0%	0%	0%	0%	12%	41%	29%
Caa1	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	67%
Caa2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Caa3	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%
Ca	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%
C	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Total	927																								

## Corporate Issuers

### Corporate Issuers - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	16	94%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	
Aa1	7	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Aa2	48	0%	0%	85%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	
Aa3	45	0%	0%	0%	87%	11%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
A1	165	0%	0%	0%	2%	85%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	2%	
A2	249	0%	0%	0%	0%	4%	82%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%	
A3	329	0%	0%	0%	0%	0%	4%	90%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	
Baa1	477	0%	0%	0%	0%	0%	0%	4%	90%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	
Baa2	522	0%	0%	0%	0%	0%	0%	0%	4%	90%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	
Baa3	452	0%	0%	0%	0%	0%	0%	0%	0%	11%	78%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	4%	
Ba1	143	0%	0%	0%	0%	0%	0%	0%	0%	1%	11%	72%	4%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	6%	3%	
Ba2	156	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	9%	72%	4%	4%	0%	0%	0%	0%	0%	0%	0%	0%	6%	3%	
Ba3	168	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	11%	68%	5%	2%	3%	1%	0%	0%	0%	0%	0%	6%	2%	
B1	152	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	8%	66%	5%	3%	5%	0%	0%	0%	0%	1%	6%	3%	
B2	132	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	62%	8%	5%	4%	0%	0%	0%	1%	8%	0%	
B3	166	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	10%	60%	9%	7%	1%	0%	0%	2%	7%	2%	
Caa1	96	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	9%	56%	20%	2%	1%	0%	2%	5%	2%	
Caa2	81	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%	58%	9%	1%	0%	10%	16%	0%	
Caa3	24	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	17%	4%	0%	67%	0%	4%	
Ca	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	50%	30%	0%	
C	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	67%	0%	0%	
Total	3,441																									

### Corporate Issuers - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	15	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	
Aa1	11	0%	64%	27%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	
Aa2	47	0%	0%	77%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	
Aa3	79	0%	0%	1%	37%	52%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	3%	
A1	131	0%	0%	0%	7%	56%	26%	3%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	3%	
A2	212	0%	0%	0%	1%	12%	66%	10%	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	1%	
A3	338	0%	0%	0%	0%	0%	7%	62%	17%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	4%	
Baa1	418	0%	0%	0%	0%	0%	2%	13%	65%	9%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	3%	
Baa2	475	0%	0%	0%	0%	0%	0%	3%	14%	63%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	4%	
Baa3	415	0%	0%	0%	0%	0%	0%	0%	3%	22%	51%	3%	1%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	10%	5%	
Ba1	162	0%	0%	0%	0%	0%	0%	0%	0%	8%	19%	36%	10%	1%	3%	0%	0%	1%	0%	0%	0%	0%	0%	15%	6%	
Ba2	159	0%	0%	0%	0%	0%	0%	0%	0%	3%	14%	11%	35%	8%	2%	0%	1%	0%	0%	0%	0%	0%	0%	20%	6%	
Ba3	151	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	9%	13%	33%	9%	3%	3%	1%	0%	0%	1%	0%	0%	23%	5%	
B1	164	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	7%	18%	29%	5%	4%	2%	4%	1%	0%	0%	2%	23%	2%	
B2	123	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	6%	15%	22%	11%	3%	1%	0%	0%	0%	6%	28%	2%	
B3	160	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	5%	18%	24%	10%	8%	1%	0%	0%	3%	24%	4%	
Caa1	150	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	5%	14%	18%	9%	3%	1%	0%	9%	33%	4%	
Caa2	91	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	4%	1%	5%	9%	16%	0%	0%	0%	22%	37%	2%	
Caa3	44	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	5%	5%	0%	0%	57%	27%	2%	
Ca	27	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	4%	4%	0%	59%	26%	0%	
C	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	80%	0%	20%	
Total	3,377																									

## Corporate Issuers - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	29	45%	7%	3%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	21%
Aa1	55	0%	5%	15%	31%	16%	0%	2%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	9%
Aa2	51	0%	0%	14%	6%	25%	2%	8%	6%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	29%
Aa3	50	0%	0%	10%	16%	16%	12%	10%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	12%
A1	142	0%	0%	0%	2%	30%	23%	9%	6%	1%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	9%
A2	225	0%	0%	7%	2%	7%	16%	12%	12%	9%	1%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	17%
A3	328	0%	0%	0%	0%	2%	9%	22%	20%	5%	3%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	16%
Baa1	347	0%	0%	0%	0%	0%	6%	16%	21%	14%	5%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	21%	12%
Baa2	362	0%	0%	0%	0%	1%	0%	7%	18%	20%	11%	4%	2%	0%	1%	0%	1%	1%	0%	0%	0%	0%	1%	19%	14%
Baa3	321	0%	0%	0%	0%	0%	0%	4%	12%	21%	14%	2%	3%	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%	25%	14%
Ba1	121	0%	0%	0%	0%	0%	0%	0%	5%	15%	15%	9%	6%	1%	1%	0%	1%	1%	2%	1%	0%	0%	2%	33%	10%
Ba2	88	0%	0%	0%	0%	0%	0%	0%	3%	6%	13%	7%	3%	8%	2%	2%	1%	1%	0%	1%	0%	0%	5%	35%	13%
Ba3	100	0%	0%	0%	0%	0%	0%	0%	2%	7%	6%	1%	2%	5%	5%	0%	6%	1%	1%	0%	0%	0%	7%	37%	20%
B1	129	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	2%	5%	7%	5%	1%	2%	2%	1%	0%	0%	0%	8%	47%	16%
B2	104	0%	0%	0%	0%	0%	0%	1%	0%	2%	1%	2%	3%	4%	5%	4%	2%	4%	0%	0%	1%	0%	13%	41%	17%
B3	117	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	1%	4%	1%	3%	3%	0%	0%	0%	0%	0%	17%	47%	22%
Caa1	98	0%	0%	1%	0%	0%	0%	0%	0%	1%	2%	1%	1%	1%	4%	4%	3%	1%	0%	1%	0%	0%	12%	52%	15%
Caa2	65	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	2%	2%	2%	2%	0%	0%	0%	0%	35%	42%	11%
Caa3	35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	3%	0%	0%	0%	0%	0%	26%	46%	20%
Ca	25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%	0%	0%	60%	16%	16%
C	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	40%	0%
Total	2,797																								



## Residential Mortgage Backed Securities (RMBS)

### RMBS - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																					Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	3,494	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	1%
Aa1	744	28%	63%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	1%
Aa2	387	14%	15%	60%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	1%
Aa3	421	8%	7%	12%	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	3%
A1	472	3%	7%	8%	9%	60%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	3%
A2	463	0%	2%	2%	5%	7%	73%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	2%
A3	444	0%	1%	1%	4%	7%	6%	64%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	5%
Baa1	415	0%	0%	0%	0%	7%	8%	6%	57%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	10%	9%
Baa2	352	0%	0%	0%	1%	1%	2%	9%	9%	63%	1%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	9%	3%
Baa3	545	0%	0%	0%	0%	1%	2%	4%	6%	3%	64%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	12%	6%
Ba1	548	0%	0%	0%	0%	0%	1%	3%	3%	7%	3%	65%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	9%	5%
Ba2	409	0%	0%	0%	0%	0%	0%	0%	1%	2%	8%	7%	65%	0%	5%	1%	0%	0%	0%	0%	0%	0%	0%	7%	3%
Ba3	440	0%	0%	0%	0%	0%	0%	0%	2%	1%	4%	11%	3%	66%	4%	1%	0%	0%	0%	0%	0%	0%	0%	5%	4%
B1	837	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	3%	1%	81%	0%	1%	0%	0%	0%	0%	0%	1%	5%	4%
B2	366	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	5%	7%	6%	68%	1%	1%	0%	0%	0%	0%	0%	5%	4%
B3	340	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	8%	1%	73%	1%	1%	0%	0%	0%	1%	6%	5%
Caa1	635	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	5%	2%	74%	0%	0%	0%	0%	3%	6%	7%
Caa2	616	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%	0%	76%	0%	0%	0%	6%	3%	9%
Caa3	698	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	4%	1%	80%	0%	0%	6%	2%	5%
Ca	1,341	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	1%	89%	0%	3%	1%	1%
C	859	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%	81%	7%	1%	5%
Total	14,826																								

### RMBS - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	1,903	71%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	2%	
Aa1	407	33%	16%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	44%	5%	
Aa2	822	10%	21%	8%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	5%	
Aa3	342	16%	10%	1%	15%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	9%	
A1	600	19%	5%	4%	5%	15%	1%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	9%	
A2	481	12%	5%	4%	4%	5%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%	9%	
A3	680	10%	4%	1%	2%	3%	2%	23%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	35%	19%	
Baa1	961	7%	3%	1%	2%	4%	2%	2%	12%	0%	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	24%	40%	
Baa2	601	6%	4%	3%	2%	2%	4%	2%	2%	14%	1%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	25%	31%	
Baa3	1,033	3%	2%	1%	1%	2%	2%	1%	3%	1%	14%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	25%	43%	
Ba1	962	3%	1%	1%	2%	2%	1%	2%	2%	2%	3%	18%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	1%	18%	41%	
Ba2	710	1%	0%	2%	1%	3%	2%	2%	2%	2%	4%	2%	18%	1%	3%	1%	0%	0%	0%	0%	0%	0%	1%	16%	40%	
Ba3	820	1%	1%	1%	1%	1%	1%	1%	3%	1%	3%	5%	2%	19%	4%	1%	0%	0%	0%	0%	0%	0%	0%	12%	42%	
B1	1,104	1%	0%	0%	0%	1%	1%	2%	2%	1%	2%	4%	3%	2%	28%	0%	1%	0%	0%	0%	0%	0%	4%	15%	31%	
B2	730	1%	1%	0%	0%	1%	1%	1%	1%	3%	3%	3%	3%	4%	6%	15%	1%	2%	0%	0%	0%	0%	2%	14%	38%	
B3	848	0%	0%	0%	0%	0%	1%	1%	2%	2%	2%	2%	2%	3%	9%	2%	15%	3%	1%	0%	0%	0%	6%	15%	36%	
Caa1	1,445	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	1%	2%	4%	2%	1%	21%	0%	0%	0%	0%	12%	12%	39%	
Caa2	1,399	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	4%	3%	2%	1%	24%	1%	0%	0%	18%	7%	35%	
Caa3	1,208	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	4%	2%	3%	5%	2%	38%	2%	0%	16%	6%	19%	
Ca	2,159	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	1%	2%	2%	4%	2%	51%	1%	14%	6%	14%	
C	1,971	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	1%	2%	2%	4%	4%	34%	26%	7%	15%	
Total	21,186																									

**RMBS - 10-Year Transition and Default Rates**  
(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	8,118	6%	2%	0%	1%	1%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	31%	
Aa1	1,033	3%	2%	1%	1%	1%	0%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	3%	48%	28%	
Aa2	1,930	1%	1%	1%	1%	2%	1%	1%	1%	1%	2%	2%	1%	1%	3%	0%	1%	1%	0%	0%	0%	0%	3%	41%	34%	
Aa3	1,582	4%	2%	1%	1%	1%	6%	2%	1%	1%	1%	2%	1%	1%	1%	0%	1%	1%	0%	0%	0%	0%	3%	42%	29%	
A1	1,538	2%	2%	0%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	3%	1%	1%	2%	1%	1%	0%	0%	4%	38%	36%	
A2	1,680	2%	1%	1%	1%	1%	1%	0%	0%	0%	1%	2%	1%	2%	3%	1%	1%	1%	1%	1%	1%	0%	7%	37%	34%	
A3	1,018	3%	1%	0%	0%	1%	0%	1%	1%	1%	1%	1%	2%	2%	3%	1%	1%	2%	1%	1%	1%	1%	10%	35%	28%	
Baa1	1,541	2%	1%	0%	0%	1%	1%	1%	1%	0%	1%	2%	1%	1%	4%	1%	1%	2%	2%	1%	1%	1%	13%	33%	27%	
Baa2	1,825	2%	1%	0%	1%	1%	0%	1%	1%	0%	1%	1%	1%	1%	3%	1%	1%	3%	2%	1%	2%	2%	18%	33%	26%	
Baa3	1,657	1%	1%	0%	1%	0%	1%	1%	0%	0%	1%	1%	1%	2%	3%	1%	1%	2%	2%	1%	2%	1%	24%	27%	24%	
Ba1	1,726	2%	1%	0%	0%	1%	0%	0%	1%	1%	1%	1%	1%	1%	3%	1%	1%	2%	3%	2%	1%	1%	37%	17%	22%	
Ba2	1,151	2%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	3%	1%	1%	2%	2%	2%	2%	2%	35%	23%	14%	
Ba3	1,328	2%	1%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	4%	1%	1%	2%	2%	3%	4%	2%	42%	15%	10%	
B1	1,150	1%	0%	0%	0%	1%	0%	0%	1%	0%	1%	2%	1%	1%	4%	1%	1%	2%	3%	3%	2%	2%	47%	15%	10%	
B2	1,079	1%	0%	0%	0%	1%	1%	0%	1%	0%	1%	1%	1%	1%	4%	2%	1%	3%	3%	5%	4%	2%	47%	10%	10%	
B3	3,104	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	3%	2%	3%	4%	1%	64%	9%	8%	
Caa1	2,479	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	3%	4%	1%	81%	3%	3%	
Caa2	2,767	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	0%	1%	2%	3%	8%	3%	75%	3%	2%	
Caa3	1,389	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	2%	11%	2%	75%	2%	2%	
Ca	3,560	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	1%	8%	4%	79%	2%	2%	
C	6,114	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	93%	2%	1%	
Total	47,769																									



## Commercial Mortgage Backed Securities (CMBS)

### CMBS - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	1,916	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Aa1	79	9%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	
Aa2	169	2%	7%	84%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	
Aa3	244	1%	1%	7%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	
A1	125	2%	0%	2%	15%	74%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%		
A2	71	1%	1%	0%	4%	6%	73%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%		
A3	164	0%	0%	0%	0%	3%	5%	79%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%		
Baa1	78	1%	1%	0%	0%	1%	1%	6%	69%	0%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%		
Baa2	62	0%	0%	0%	0%	5%	0%	3%	2%	66%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	23%	0%		
Baa3	108	0%	0%	0%	0%	0%	1%	0%	1%	5%	76%	5%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	12%	0%		
Ba1	58	0%	2%	0%	0%	0%	0%	2%	0%	2%	12%	48%	2%	3%	2%	0%	0%	0%	0%	0%	0%	3%	24%	0%		
Ba2	67	0%	0%	0%	0%	0%	1%	0%	0%	0%	3%	0%	78%	3%	4%	1%	0%	0%	0%	0%	0%	0%	7%	1%		
Ba3	56	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	68%	7%	2%	0%	2%	0%	0%	0%	0%	18%	0%		
B1	54	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%	2%	0%	54%	0%	6%	2%	0%	0%	0%	0%	30%	0%		
B2	57	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	2%	72%	7%	4%	0%	0%	0%	2%	11%	0%		
B3	54	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	63%	19%	4%	0%	0%	0%	2%	9%	0%		
Caa1	40	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	3%	60%	0%	8%	0%	0%	25%	0%		
Caa2	34	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	62%	9%	0%	3%	12%	0%		
Caa3	66	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	2%	5%	0%	56%	6%	6%	23%	0%		
Ca	23	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	4%	22%	4%	0%		
C	71	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	61%	32%	4%		
Total	3,596																									

### CMBS - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	1,829	64%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36%	0%
Aa1	118	7%	47%	0%	3%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	42%	0%
Aa2	186	3%	6%	53%	0%	0%	1%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	35%	0%
Aa3	223	1%	2%	10%	57%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%	0%
A1	165	1%	1%	2%	15%	47%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	30%	0%
A2	115	2%	0%	1%	5%	9%	29%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	0%
A3	185	1%	1%	0%	2%	2%	8%	48%	2%	1%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	34%	0%
Baa1	96	3%	0%	0%	1%	1%	1%	6%	25%	15%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	46%	0%
Baa2	99	3%	0%	0%	0%	5%	1%	4%	6%	16%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	63%	0%
Baa3	161	2%	0%	0%	1%	0%	0%	2%	4%	4%	32%	8%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	43%	0%
Ba1	85	0%	1%	0%	0%	0%	0%	0%	0%	0%	9%	13%	1%	0%	2%	0%	0%	0%	0%	0%	0%	0%	4%	68%	1%
Ba2	123	0%	1%	0%	0%	1%	0%	0%	1%	0%	4%	1%	35%	4%	10%	2%	2%	2%	0%	1%	0%	0%	1%	37%	0%
Ba3	71	1%	0%	0%	0%	0%	0%	1%	1%	1%	0%	4%	1%	27%	3%	0%	4%	4%	0%	1%	0%	0%	3%	45%	1%
B1	76	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%	13%	1%	1%	0%	0%	0%	0%	0%	7%	72%	0%
B2	113	0%	1%	0%	0%	0%	1%	1%	1%	0%	0%	1%	1%	3%	0%	29%	7%	13%	1%	4%	0%	1%	5%	31%	0%
B3	82	0%	1%	0%	0%	0%	1%	0%	1%	0%	0%	1%	0%	0%	9%	1%	17%	5%	2%	0%	0%	0%	13%	48%	0%
Caa1	92	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	0%	0%	4%	10%	3%	2%	1%	1%	16%	58%	0%
Caa2	81	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	6%	17%	4%	0%	4%	28%	38%	0%
Caa3	144	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	1%	1%	0%	1%	0%	1%	2%	1%	20%	3%	2%	35%	29%	0%
Ca	47	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	23%	11%	45%	17%	0%
C	178	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	2%	18%	65%	14%	0%
Total	4,269																								

**CMBS - 10-Year Transition and Default Rates**  
(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	2,569	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	86%	13%	
Aa1	174	1%	0%	0%	1%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	2%	89%	5%	
Aa2	387	0%	1%	1%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%	83%	10%	
Aa3	266	0%	0%	0%	0%	0%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	6%	82%	6%	
A1	291	0%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	0%	1%	0%	0%	9%	77%	4%	
A2	394	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	1%	1%	0%	0%	10%	76%	7%	
A3	341	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	1%	1%	1%	1%	15%	74%	3%	
Baa1	367	1%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	22%	68%	5%	
Baa2	422	0%	0%	0%	0%	1%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	20%	68%	5%	
Baa3	436	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	28%	61%	3%	
Ba1	396	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	1%	1%	0%	0%	0%	1%	34%	57%	4%	
Ba2	416	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	35%	57%	4%	
Ba3	393	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	1%	1%	0%	1%	41%	51%	4%	
B1	350	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	1%	49%	42%	4%	
B2	377	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	61%	34%	2%	
B3	386	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	64%	32%	2%	
Caa1	292	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	69%	26%	1%	
Caa2	328	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	83%	13%	1%	
Caa3	435	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	82%	14%	1%	
Ca	197	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	1%	94%	3%	1%	
C	295	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	97%	2%	1%	
Total	9,512																									

CMBS: Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## Collateralized Loan Obligations (CLOs)

### CLOs - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	1,707	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	
Aa1	123	24%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	0%	
Aa2	968	1%	4%	88%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	
Aa3	23	0%	13%	9%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	
A1	39	0%	10%	8%	5%	44%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	
A2	858	0%	0%	0%	0%	3%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	
A3	26	0%	0%	0%	0%	0%	0%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	
Baa1	13	0%	0%	8%	0%	0%	8%	0%	54%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	0%	
Baa2	216	0%	0%	0%	0%	0%	0%	1%	5%	83%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	
Baa3	620	0%	0%	0%	0%	0%	0%	0%	0%	3%	88%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	
Ba1	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	75%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	
Ba2	238	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	91%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	
Ba3	609	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	90%	1%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	
B1	38	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
B2	227	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	89%	1%	1%	0%	0%	0%	0%	0%	7%	0%	
B3	173	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	92%	2%	1%	0%	0%	0%	0%	4%	0%	
Caa1	11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	18%	36%	0%	0%	0%	27%	0%	
Caa2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	
Caa3	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	0%	33%	0%	0%	
Ca	-																									
C	-																									
Total	5,902																									

### CLOs - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	1,812	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	97%	0%	
Aa1	122	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	98%	0%	
Aa2	668	1%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	93%	0%	
Aa3	47	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	
A1	41	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	
A2	553	0%	0%	0%	0%	1%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	92%	0%	
A3	53	0%	0%	0%	0%	2%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	92%	0%	
Baa1	31	3%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	94%	0%	
Baa2	144	0%	0%	0%	0%	0%	0%	1%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	94%	0%	
Baa3	442	0%	0%	0%	0%	0%	0%	1%	1%	1%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	88%	0%	
Ba1	58	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	98%	0%	
Ba2	178	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	12%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	86%	0%	
Ba3	427	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	17%	1%	0%	0%	0%	0%	0%	0%	0%	0%	80%	0%	
B1	39	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	5%	0%	0%	3%	0%	0%	0%	0%	5%	85%	0%	
B2	187	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	13%	3%	2%	2%	3%	0%	0%	0%	71%	0%	
B3	92	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	12%	2%	3%	2%	0%	0%	0%	79%	0%	
Caa1	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	
Caa2	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	75%	0%	
Caa3	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	57%	43%	0%		
Ca	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	75%	0%	
C	-																									
Total	4,917																									

**CLOs - 10-Year Transition and Default Rates**  
(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	491	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	94%	5%
Aa1	253	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Aa2	281	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	1%
Aa3	246	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	0%
A1	191	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
A2	190	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	98%	1%
A3	165	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Baa1	130	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	98%	2%
Baa2	139	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	1%
Baa3	230	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Ba1	271	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	97%	3%
Ba2	169	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	1%
Ba3	205	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
B1	262	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
B2	111	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	1%
B3	141	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	96%	1%
Caa1	111	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	0%
Caa2	186	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	99%	0%
Caa3	257	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	94%	0%
Ca	201	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	96%	1%
C	61	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	2%	2%	3%	2%	0%	2%	0%	0%	0%	0%	3%	84%	2%
Total	4,291																								

## Collateralized Debt Obligations (CDOs)

### CDOs - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	130	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	0%	
Aa1	56	39%	55%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	
Aa2	53	0%	34%	47%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	0%	
Aa3	39	0%	13%	15%	59%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	
A1	31	0%	0%	13%	35%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	
A2	37	0%	0%	0%	5%	22%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	0%	
A3	26	0%	0%	4%	0%	8%	4%	73%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	4%	
Baa1	8	0%	0%	0%	0%	13%	25%	13%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Baa2	13	0%	0%	0%	0%	0%	0%	8%	8%	54%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	0%	
Baa3	38	0%	0%	0%	0%	0%	0%	8%	8%	13%	58%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	
Ba1	21	0%	0%	0%	0%	0%	0%	0%	10%	0%	19%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	
Ba2	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	33%	47%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	
Ba3	22	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	9%	0%	73%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	
B1	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	20%	50%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	
B2	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	40%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
B3	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	13%	6%	0%	63%	0%	0%	0%	0%	0%	0%	6%	0%	
Caa1	19	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	89%	0%	0%	0%	0%	0%	11%	0%	
Caa2	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	8%	67%	8%	0%	0%	0%	0%	0%	
Caa3	26	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	15%	69%	4%	0%	0%	8%	0%	
Ca	123	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	93%	0%	5%	2%	0%	
C	279	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	95%	5%	0%	0%	
Total	984																									

### CDOs - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	198	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	84%	1%	
Aa1	52	23%	23%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	54%	0%	
Aa2	73	12%	11%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	0%	
Aa3	33	9%	45%	6%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	3%	
A1	47	0%	17%	11%	17%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	51%	2%	
A2	62	0%	6%	2%	13%	5%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	61%	0%	
A3	28	0%	7%	4%	18%	21%	4%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	4%	
Baa1	17	0%	0%	0%	6%	6%	6%	6%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	71%	0%	
Baa2	17	0%	0%	0%	0%	12%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	82%	0%	
Baa3	59	3%	2%	5%	3%	12%	0%	2%	2%	3%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	63%	0%	
Ba1	31	0%	0%	0%	0%	3%	3%	10%	23%	3%	6%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	48%	0%	
Ba2	27	0%	0%	0%	4%	0%	0%	0%	0%	4%	11%	15%	4%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	56%	4%	
Ba3	29	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	3%	0%	14%	0%	0%	0%	0%	3%	0%	0%	0%	0%	69%	3%	
B1	21	0%	0%	5%	0%	5%	5%	0%	0%	0%	0%	19%	10%	5%	5%	0%	0%	0%	0%	0%	0%	0%	0%	48%	0%	
B2	28	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	11%	4%	11%	7%	7%	0%	0%	0%	0%	0%	0%	0%	50%	7%	
B3	32	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	6%	13%	0%	6%	16%	0%	3%	0%	0%	0%	0%	44%	9%	
Caa1	28	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	0%	11%	0%	4%	43%	0%	0%	0%	0%	0%	36%	0%	
Caa2	30	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	7%	10%	10%	3%	0%	0%	0%	60%	0%	
Caa3	69	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	3%	4%	1%	4%	1%	6%	22%	6%	0%	10%	41%	0%	
Ca	225	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	49%	16%	22%	11%	1%	
C	345	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	66%	30%	1%	1%	
Total	1,451																									

## CDOs - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	394	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	69%	26%
Aa1	122	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	26%
Aa2	115	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	74%	24%
Aa3	141	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	85%	13%
A1	149	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	78%	18%
A2	96	3%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	66%	29%
A3	139	4%	7%	2%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	69%	17%
Baa1	99	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	67%	26%
Baa2	97	0%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	68%	27%
Baa3	125	2%	2%	1%	1%	1%	0%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	72%	19%
Ba1	219	5%	2%	2%	4%	2%	2%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	1%	63%	15%
Ba2	145	0%	1%	2%	3%	1%	1%	1%	0%	0%	1%	0%	0%	0%	0%	1%	1%	0%	1%	1%	3%	0%	2%	68%	12%
Ba3	104	2%	5%	0%	5%	0%	1%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	1%	0%	2%	1%	0%	2%	65%	13%
B1	141	2%	3%	0%	1%	3%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	1%	0%	5%	69%	13%
B2	114	0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	2%	3%	0%	0%	0%	0%	0%	0%	1%	4%	0%	8%	60%	20%
B3	137	0%	0%	0%	1%	3%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	6%	0%	0%	1%	0%	7%	67%	14%
Caa1	144	0%	1%	0%	1%	0%	0%	0%	2%	1%	1%	1%	0%	1%	0%	0%	0%	1%	0%	0%	5%	1%	14%	62%	10%
Caa2	217	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	15%	3%	7%	59%	11%
Caa3	343	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%	6%	3%	12%	64%	9%
Ca	1,069	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	3%	6%	28%	47%	12%
C	1,182	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	71%	10%	2%
Total	5,292																								

CDO: Derivative securities such as structured notes and repackaged securities are not considered as part of this sector. Commercial real estate (CRE) CDOs are also excluded (see the definition of CMBS).



## Asset-Backed Commercial Paper (ABCP)

### ABCP - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)				Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	P-1	P-2	P-3	NP	Default	Paid Off	Withdrawn (other)
P-1	115	93%	0%	0%	0%	0%	7%	0%
P-2	3	0%	67%	0%	0%	0%	0%	33%
P-3	1	0%	0%	100%	0%	0%	0%	0%
NP	-							
<b>Total</b>	<b>119</b>							

### ABCP - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)				Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	P-1	P-2	P-3	NP	Default	Paid Off	Withdrawn (other)
P-1	111	86%	0%	0%	0%	0%	14%	0%
P-2	4	0%	50%	25%	0%	0%	0%	25%
P-3	-							
NP	-							
<b>Total</b>	<b>115</b>							

### ABCP - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)				Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	P-1	P-2	P-3	NP	Default	Paid Off	Withdrawn (other)
P-1	211	33%	1%	0%	0%	0%	41%	26%
P-2	1	0%	0%	0%	0%	0%	100%	0%
P-3	-							
NP	1	0%	0%	0%	0%	0%	0%	100%
<b>Total</b>	<b>213</b>							

## Other Asset Backed Securities (Other ABS)

### Other ABS - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	2,607	76%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	24%	0%	
Aa1	178	25%	53%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	1%	
Aa2	185	25%	16%	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	2%	
Aa3	258	8%	6%	5%	55%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	0%	
A1	189	11%	5%	5%	10%	54%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	3%	
A2	170	5%	5%	6%	4%	11%	50%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	2%	
A3	107	4%	7%	6%	7%	6%	5%	47%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	4%	
Baa1	100	1%	1%	2%	7%	4%	3%	4%	45%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	4%	
Baa2	131	2%	1%	2%	2%	3%	4%	4%	10%	60%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	2%	
Baa3	171	1%	1%	1%	1%	1%	1%	2%	7%	5%	71%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	2%	
Ba1	65	0%	0%	0%	0%	0%	5%	2%	2%	2%	8%	57%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	8%	
Ba2	68	0%	0%	1%	0%	0%	1%	1%	1%	4%	7%	7%	43%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	26%	3%	
Ba3	48	0%	0%	2%	2%	0%	0%	0%	0%	2%	4%	2%	2%	56%	2%	2%	2%	0%	0%	0%	0%	0%	0%	15%	8%	
B1	51	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	6%	4%	67%	2%	0%	0%	0%	0%	0%	0%	0%	6%	12%	
B2	59	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	2%	0%	63%	12%	0%	0%	0%	0%	0%	0%	10%	8%	
B3	42	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%	0%	0%	2%	62%	2%	7%	0%	0%	0%	0%	10%	12%	
Caa1	33	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	58%	3%	18%	0%	0%	0%	6%	9%	
Caa2	24	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	58%	4%	4%	0%	0%	25%	0%	
Caa3	39	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	3%	59%	10%	0%	0%	15%	8%	
Ca	27	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	0%	0%	0%	22%	7%	
C	83	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	81%	2%	4%	12%		
Total	4,635																									

### Other ABS - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																					Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	2,330	36%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	64%	0%
Aa1	197	19%	18%	2%	7%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	1%
Aa2	345	31%	4%	8%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	52%	1%
Aa3	220	26%	4%	4%	15%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	49%	0%
A1	246	16%	5%	5%	5%	22%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	41%	2%
A2	195	14%	0%	1%	3%	5%	17%	1%	1%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	56%	2%
A3	136	13%	2%	0%	8%	7%	2%	18%	4%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	41%	3%
Baa1	141	8%	4%	0%	4%	4%	4%	2%	11%	4%	4%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	52%	3%
Baa2	147	14%	2%	1%	1%	3%	3%	3%	5%	18%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	44%	1%
Baa3	189	6%	0%	1%	1%	3%	1%	1%	4%	1%	47%	3%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	31%	2%
Ba1	80	8%	1%	1%	0%	0%	3%	0%	1%	1%	1%	23%	4%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	48%	8%
Ba2	52	2%	4%	0%	2%	4%	2%	0%	2%	2%	2%	2%	25%	4%	2%	0%	0%	0%	0%	0%	0%	0%	0%	44%	4%
Ba3	68	1%	1%	0%	3%	0%	0%	0%	0%	3%	0%	0%	1%	28%	4%	1%	1%	0%	0%	0%	0%	0%	0%	47%	7%
B1	62	0%	2%	0%	2%	0%	2%	0%	2%	0%	2%	3%	0%	3%	34%	5%	0%	0%	2%	2%	0%	0%	0%	35%	8%
B2	57	0%	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%	2%	33%	12%	2%	0%	0%	0%	0%	0%	39%	9%
B3	62	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	3%	2%	0%	0%	11%	32%	6%	5%	0%	0%	0%	0%	27%	11%
Caa1	37	0%	3%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	3%	0%	0%	22%	5%	27%	11%	3%	0%	14%	11%
Caa2	28	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	11%	0%	7%	29%	0%	4%	0%	0%	43%	4%
Caa3	38	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	11%	5%	32%	5%	0%	3%	32%	5%
Ca	38	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	29%	11%	3%	37%	16%
C	93	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	65%	11%	8%	14%
Total	4,761																								

# Other ABS - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	3,268	9%	1%	0%	1%	1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	14%
Aa1	269	11%	1%	2%	0%	5%	0%	3%	4%	1%	7%	3%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	1%	46%	9%
Aa2	266	4%	0%	3%	1%	0%	0%	0%	0%	1%	0%	0%	0%	2%	1%	0%	0%	0%	1%	0%	0%	0%	0%	58%	29%
Aa3	321	1%	1%	1%	1%	0%	2%	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	0%	1%	0%	0%	0%	2%	65%	21%
A1	256	4%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%	2%	77%	13%
A2	675	5%	1%	0%	1%	1%	1%	0%	0%	1%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	69%	17%
A3	407	1%	1%	0%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%	0%	1%	2%	76%	7%
Baa1	291	2%	0%	0%	1%	0%	1%	0%	0%	1%	1%	0%	0%	0%	2%	0%	0%	2%	1%	0%	0%	0%	5%	69%	14%
Baa2	433	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	72%	21%
Baa3	536	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	0%	1%	3%	0%	1%	1%	1%	1%	3%	70%	12%
Ba1	161	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	69%	23%
Ba2	164	0%	1%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	2%	6%	0%	1%	5%	71%	12%
Ba3	115	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	4%	11%	61%	20%
B1	64	0%	2%	0%	0%	0%	0%	2%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%	5%	6%	14%	59%	9%
B2	124	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	6%	7%	74%	11%
B3	115	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	4%	30%	54%	9%
Caa1	86	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	7%	3%	76%	10%
Caa2	52	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	8%	4%	69%	17%
Caa3	66	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	12%	58%	8%
Ca	56	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	25%	50%	23%
C	80	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	40%	41%	10%	
Total	7,805																								

## Other Structured Finance Products (Other SFPs)

### Other SFPs - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	1,393	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	
Aa1	254	33%	64%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	
Aa2	137	2%	17%	70%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	
Aa3	77	1%	3%	9%	79%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	
A1	136	1%	1%	1%	27%	59%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	1%	
A2	132	0%	2%	0%	1%	20%	71%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	2%	
A3	86	0%	0%	0%	2%	24%	12%	45%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	1%	
Baa1	51	0%	0%	0%	0%	4%	2%	12%	61%	0%	0%	0%	2%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	4%	14%	
Baa2	41	0%	0%	0%	0%	2%	0%	15%	17%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	5%	
Baa3	34	0%	0%	0%	0%	0%	0%	0%	6%	3%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	
Ba1	67	0%	0%	0%	0%	0%	0%	3%	1%	13%	31%	43%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Ba2	33	0%	0%	0%	0%	0%	0%	0%	15%	0%	15%	6%	21%	0%	3%	3%	0%	0%	0%	0%	0%	0%	0%	24%	12%	
Ba3	50	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	16%	0%	44%	6%	2%	0%	0%	0%	0%	0%	0%	0%	0%	2%	
B1	41	0%	0%	0%	0%	0%	0%	0%	0%	5%	5%	5%	5%	0%	59%	7%	7%	2%	0%	0%	0%	0%	0%	5%	0%	
B2	61	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	5%	2%	0%	62%	5%	2%	0%	2%	0%	3%	0%	3%	13%	
B3	54	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%	70%	2%	0%	0%	0%	0%	0%	13%	7%	
Caa1	98	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	74%	0%	1%	1%	2%	0%	13%	6%	
Caa2	234	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	81%	3%	0%	1%	0%	6%	8%	
Caa3	358	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	87%	0%	2%	0%	1%	7%	
Ca	373	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	88%	1%	0%	1%	6%	
C	459	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	75%	1%	7%	7%	
Total	4,169																									

### Other SFPs - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																					Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	1,192	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	1%
Aa1	187	36%	45%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	1%
Aa2	162	2%	16%	42%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	2%
Aa3	91	1%	9%	14%	34%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36%	1%
A1	162	4%	4%	1%	19%	24%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	2%
A2	143	1%	5%	1%	1%	21%	45%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	19%	6%
A3	118	3%	4%	0%	4%	19%	13%	25%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	2%
Baa1	94	2%	0%	0%	0%	2%	3%	4%	15%	1%	0%	0%	3%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	29%	39%
Baa2	67	1%	3%	0%	1%	1%	0%	3%	10%	6%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	45%	25%
Baa3	110	0%	2%	0%	0%	0%	0%	2%	7%	1%	15%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	36%	36%
Ba1	83	2%	0%	0%	2%	0%	1%	0%	0%	0%	2%	25%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	24%	40%
Ba2	80	0%	0%	0%	0%	4%	0%	3%	0%	0%	26%	1%	5%	0%	3%	0%	1%	0%	0%	0%	0%	0%	0%	18%	40%
Ba3	288	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	7%	5%	6%	3%	0%	0%	0%	5%	0%	0%	23%	49%
B1	116	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	8%	4%	2%	0%	0%	1%	0%	7%	0%	22%	55%
B2	125	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	1%	0%	1%	0%	11%	2%	2%	1%	1%	2%	7%	0%	18%	52%
B3	172	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	2%	12%	8%	3%	7%	1%	8%	1%	17%	39%
Caa1	314	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	13%	4%	2%	1%	7%	0%	17%	53%
Caa2	564	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	27%	4%	2%	6%	1%	18%	38%
Caa3	775	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	1%	1%	34%	3%	7%	0%	15%	37%
Ca	677	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	4%	46%	8%	2%	10%	28%
C	438	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	5%	33%	6%	29%	25%
Total	5,958																								

## Other SFPs - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	2,941	6%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	57%	35%	
Aa1	271	3%	8%	3%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	44%	31%	
Aa2	332	0%	0%	1%	0%	8%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	42%	41%	
Aa3	275	2%	1%	0%	1%	1%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	42%	
A1	284	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	53%	43%	
A2	278	0%	0%	0%	0%	7%	4%	1%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	51%	33%	
A3	225	0%	0%	0%	0%	0%	0%	0%	2%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	52%	40%	
Baa1	198	0%	0%	0%	0%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%	1%	0%	1%	2%	1%	0%	0%	1%	51%	41%	
Baa2	217	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	47%	49%	
Baa3	237	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	2%	46%	51%	
Ba1	266	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%	0%	0%	2%	31%	62%	
Ba2	134	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	4%	47%	45%	
Ba3	197	0%	0%	0%	0%	0%	1%	0%	1%	0%	11%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	1%	2%	38%	45%	
B1	168	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	2%	42%	54%	
B2	169	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	7%	41%	49%	
B3	531	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	2%	0%	1%	4%	23%	69%	
Caa1	498	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	5%	23%	70%	
Caa2	515	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%	3%	1%	7%	22%	64%	
Caa3	429	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	1%	35%	31%	29%	
Ca	712	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%	20%	49%	23%	
C	701	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	28%	46%	23%	
Total	9,578																									

Other SFPs includes the following Moody's rated long-term product lines: \*

- » ABCP - Fully Supported
- » ABCP - Mortgage Warehouse
- » ABCP - Other
- » ABCP - Partially Supported
- » ABS - Leases - Aircraft - Repacs
- » ABS - Repackaged Securities
- » CDO - Repackaged Securities
- » CDO - Repackaged Securities - CBO
- » CDO - Repackaged Securities - CLO
- » CDO - Resecuritization
- » CDO - Resecuritization - Cash Flow
- » CDO - Resecuritization - Synthetic
- » Covered Bonds \*\*
- » MBS - Resecuritized Agency Guaranteed
- » MBS - Resecuritized MBS
- » Other - CAPCO
- » Other - Collateralized GICs
- » Other - Insurance Linked
- » Other - Repackaged Securities
- » Other - Structured Covered Bonds
- » Other - Structured Notes
- » Other - Tax Credit Linked Structured Notes
- » Structured Investment Vehicles - CDO

\* Starting from November 1, 2016, nonconventional securities like Interest-Only (IO) tranches and combination securities (combo notes) are reclassified as other structured finance products.

\*\* Please note that single-issuer covered bonds are reported on deal level instead of on series level. The rationale is that ratings of a covered bond deal are almost always unambiguously the same as ratings of such deal's underlying series. Given a covered bond deal could have as many as 300 series issued under it, reporting on series level would introduce great amount of redundancy. In the rare cases where a covered bond deal has different ratings on its concurrently outstanding series, the rating for a covered bond deal is generally taken as the rating of the highest rated series.

## Sovereign Issuers

### Sovereign Issuers - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	12	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa1	2	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa2	8	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa3	5	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A1	7	0%	0%	0%	14%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A2	5	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A3	8	0%	0%	0%	0%	0%	25%	75%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa1	4	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa2	8	0%	0%	0%	0%	0%	0%	0%	13%	75%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa3	8	0%	0%	0%	0%	0%	0%	0%	0%	88%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba1	6	0%	0%	0%	0%	0%	0%	0%	0%	17%	67%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba2	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba3	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	89%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B1	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	88%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B2	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	94%	0%	0%	6%	0%	0%	0%	0%	0%	0%
B3	18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	11%	72%	6%	6%	0%	0%	0%	0%	0%	0%
Caa1	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	75%	25%	0%	0%	0%	0%	0%	0%
Caa2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%
Caa3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	135	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### Sovereign Issuers - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																					Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	12	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa1	5	0%	40%	60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa2	6	0%	0%	83%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa3	6	0%	0%	0%	67%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A1	5	0%	0%	0%	20%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A2	4	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A3	9	0%	0%	0%	0%	0%	33%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa1	3	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa2	9	0%	0%	0%	0%	0%	0%	0%	22%	44%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa3	9	0%	0%	0%	0%	0%	0%	0%	11%	22%	44%	11%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba1	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	38%	13%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba2	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba3	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	60%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B1	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	35%	24%	24%	6%	6%	0%	0%	0%	0%	0%	0%	0%
B2	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	80%	0%	0%	10%	0%	0%	0%	0%	0%	0%
B3	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	57%	7%	14%	0%	0%	0%	7%	0%	0%
Caa1	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	0%	0%	0%	33%	0%	0%
Caa2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	50%	0%	0%
Caa3	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	25%	0%	0%	0%	50%	0%	0%	0%
Ca	-																								
C	-																								
Total	134																								



## Sovereign Issuers - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																					Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	18	67%	11%	17%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa1	2	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa2	10	0%	0%	40%	10%	10%	10%	0%	10%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa3	4	0%	0%	0%	75%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%
A1	8	0%	0%	0%	13%	63%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A2	6	0%	0%	17%	0%	0%	33%	0%	0%	0%	0%	17%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	17%	0%	0%
A3	3	0%	0%	0%	0%	0%	0%	33%	0%	0%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa1	6	0%	0%	0%	0%	0%	0%	33%	17%	0%	33%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa2	3	0%	0%	0%	0%	0%	0%	0%	33%	0%	33%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa3	8	0%	0%	0%	0%	0%	13%	25%	0%	13%	13%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%
Ba1	7	0%	0%	0%	0%	0%	0%	0%	14%	14%	0%	14%	14%	0%	14%	14%	14%	0%	0%	0%	0%	0%	0%	0%	0%
Ba2	5	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	20%	0%	20%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba3	5	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	0%	0%	20%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B1	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	14%	29%	43%	0%	0%	0%	0%	0%	0%	0%	0%
B2	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	11%	11%	11%	0%	11%	0%	0%	0%	0%	22%	0%	11%
B3	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	50%	0%	0%
Caa1	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	33%	0%	0%	0%	33%	0%	0%
Caa2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caa3	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

## United States Public Finance

### United States Public Finance - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																						Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)	
Aaa	686	96%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	
Aa1	993	3%	93%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	
Aa2	2,482	0%	3%	92%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	
Aa3	2,217	0%	0%	4%	90%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	3%	
A1	2,110	0%	0%	0%	4%	88%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	3%	
A2	1,146	0%	0%	0%	1%	5%	87%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	3%	
A3	677	0%	0%	0%	0%	1%	9%	84%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	
Baa1	320	0%	0%	0%	0%	1%	1%	6%	81%	4%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	5%	
Baa2	255	0%	0%	0%	0%	0%	0%	2%	7%	81%	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	
Baa3	214	0%	0%	0%	0%	0%	0%	0%	1%	7%	81%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	
Ba1	64	0%	0%	0%	0%	0%	0%	0%	0%	5%	3%	78%	9%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	
Ba2	35	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	74%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	
Ba3	27	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	7%	
B1	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	63%	13%	0%	0%	0%	0%	0%	0%	0%	0%	13%	
B2	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	20%	40%	10%	0%	0%	0%	0%	0%	0%	0%	20%	
B3	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	63%	25%	13%	0%	0%	0%	0%	0%	0%	
Caa1	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	25%	0%	0%	0%	0%	0%	25%	
Caa2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%	0%	
Caa3	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	
Ca	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	
C	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
Total	11,264																									

### United States Public Finance - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	639	88%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%
Aa1	938	9%	78%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	6%
Aa2	2,593	1%	8%	74%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	7%
Aa3	2,281	0%	1%	12%	69%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	8%
A1	2,366	0%	0%	1%	11%	64%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	10%
A2	1,242	0%	0%	1%	3%	13%	60%	6%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	10%
A3	685	0%	0%	0%	1%	2%	16%	58%	7%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	8%
Baa1	332	0%	0%	0%	0%	1%	6%	14%	49%	9%	3%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	14%
Baa2	228	0%	0%	0%	0%	0%	2%	4%	12%	49%	8%	4%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	13%
Baa3	187	0%	1%	1%	0%	1%	1%	2%	4%	17%	43%	6%	4%	2%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	18%
Ba1	58	0%	0%	0%	0%	0%	0%	0%	0%	10%	16%	33%	10%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%
Ba2	43	0%	0%	0%	0%	0%	2%	0%	5%	9%	5%	9%	28%	16%	5%	0%	2%	0%	0%	0%	0%	0%	0%	0%	19%
Ba3	20	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	10%	25%	0%	5%	0%	10%	0%	0%	0%	0%	0%	5%	35%
B1	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	21%	7%	14%	7%	0%	0%	7%	7%	0%	0%	0%	0%	21%
B2	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%
B3	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	14%	0%	29%	14%	14%	0%	0%	0%	14%	0%	0%
Caa1	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	33%	0%	0%	0%	0%	0%	0%	0%	50%
Caa2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caa3	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	17%	33%	17%	17%
Ca	3	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	0%
C	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%
Total	11,652																								

# United States Public Finance - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	1,114	39%	7%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%	26%
Aa1	892	14%	48%	13%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	14%
Aa2	3,253	2%	11%	43%	9%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	18%
Aa3	2,549	0%	1%	13%	34%	9%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	23%
A1	3,294	0%	0%	4%	10%	26%	6%	3%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	28%
A2	1,103	0%	0%	1%	7%	12%	19%	6%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	30%
A3	478	0%	0%	0%	3%	7%	12%	15%	5%	3%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	12%	39%
Baa1	354	0%	0%	0%	1%	2%	6%	8%	13%	5%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	23%	40%
Baa2	207	0%	0%	0%	0%	1%	3%	3%	7%	12%	5%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	52%
Baa3	154	0%	0%	0%	0%	1%	2%	2%	2%	8%	7%	2%	3%	1%	0%	1%	0%	0%	0%	1%	0%	0%	1%	12%	58%
Ba1	48	0%	0%	0%	0%	4%	0%	2%	0%	2%	8%	4%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	6%	17%	54%
Ba2	41	0%	0%	0%	0%	0%	0%	0%	10%	5%	5%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%	0%	20%	56%
Ba3	40	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	5%	18%	70%
B1	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%	22%	0%	56%
B2	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	0%	78%
B3	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	63%
Caa1	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	17%	17%
Caa2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%
Caa3	-																								
Ca	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	67%
C	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	75%	0%
Total	13,568																								

## International Public Finance

### International Public Finance - 1-Year Transition and Default Rates

(December 31, 2018 through December 31, 2019)

Credit Ratings as of 12/31/2018		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2018 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	17	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa1	11	0%	91%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa2	21	0%	5%	90%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa3	14	0%	0%	7%	79%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A1	23	0%	0%	0%	22%	78%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A2	15	0%	0%	0%	0%	53%	47%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A3	6	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa1	15	0%	0%	0%	0%	0%	0%	7%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa2	8	0%	0%	0%	0%	0%	0%	0%	0%	75%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%
Baa3	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba1	24	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	79%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%
Ba2	22	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	64%	5%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	5%
Ba3	25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	64%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%
B1	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	24%	71%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B2	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	29%	0%	0%	59%	0%	0%	0%	0%	0%	6%
B3	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	43%	0%	14%	29%	0%	0%	0%	0%	0%
Caa1	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	50%	0%	0%	0%	0%	0%	0%	25%
Caa2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caa3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	263	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### International Public Finance - 3-Year Transition and Default Rates

(December 31, 2016 through December 31, 2019)

Credit Ratings as of 12/31/2016		Credit Ratings as of 12/31/2019 (Percent)																					Other Outcomes During 12/31/2016 - 12/31/2019 (Percent)		
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	16	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa1	14	7%	64%	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
Aa2	23	0%	9%	61%	17%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%
Aa3	5	0%	0%	20%	40%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A1	18	0%	0%	0%	17%	78%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A2	12	0%	0%	0%	17%	67%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%
A3	8	0%	0%	0%	13%	0%	38%	13%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%
Baa1	13	0%	0%	0%	0%	0%	0%	31%	46%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%
Baa2	19	0%	0%	0%	0%	0%	0%	0%	26%	11%	58%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
Baa3	12	0%	0%	0%	0%	0%	0%	0%	0%	17%	50%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%
Ba1	25	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	28%	20%	4%	8%	0%	4%	0%	0%	0%	0%	0%	0%	0%	28%
Ba2	23	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	57%	26%	4%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	9%
Ba3	23	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	48%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%
B1	21	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	43%	14%	0%	0%	0%	0%	0%	0%	0%	0%	10%
B2	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	40%	0%	20%	0%	0%	0%	0%	0%	0%	0%
B3	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	67%	8%	0%	0%	0%	0%	8%
Caa1	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	17%	0%	33%	0%	0%	0%	0%	0%	33%
Caa2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caa3	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%
Ca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	257	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

# International Public Finance - 10-Year Transition and Default Rates

(December 31, 2009 through December 31, 2019)

Credit Ratings as of 12/31/2009		Credit Ratings as of 12/31/2019 (Percent)																				Other Outcomes During 12/31/2009 - 12/31/2019 (Percent)			
Credit Ratings	Number of Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)
Aaa	32	44%	13%	13%	0%	0%	0%	6%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%
Aa1	22	9%	27%	9%	14%	0%	0%	0%	9%	9%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	9%
Aa2	36	0%	3%	19%	0%	36%	3%	0%	3%	3%	3%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%
Aa3	19	0%	0%	0%	0%	5%	11%	0%	0%	0%	21%	11%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%
A1	8	0%	0%	0%	13%	0%	0%	0%	0%	0%	25%	13%	13%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%
A2	10	0%	0%	0%	20%	10%	10%	0%	0%	0%	0%	10%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	20%
A3	6	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	50%
Baa1	8	0%	0%	0%	0%	0%	0%	13%	38%	0%	25%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%	13%
Baa2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%
Baa3	14	0%	0%	0%	0%	0%	0%	0%	7%	7%	29%	21%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	21%
Ba1	25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	12%	16%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	56%
Ba2	26	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	15%	19%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%
Ba3	20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	5%	10%	30%	15%	5%	0%	0%	0%	0%	0%	5%	25%	
B1	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	8%	8%	17%	0%	8%	0%	8%	0%	0%	0%	0%	0%	42%
B2	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	50%	0%	25%
B3	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	50%	0%	0%
Caa1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caa2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caa3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	248	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

## Definition of Symbols

Moody's definitions of the symbols, numbers and scores in the rating scales used by Moody's to denote credit rating categories and notches within those categories for the classes and subclasses of credit ratings shown in the Matrices, are as follows:

## Moody's Global Rating Scales

Ratings assigned on Moody's global long-term and short-term rating scales are forward-looking opinions of the relative credit risks of financial obligations issued by non-financial corporates, financial institutions, structured finance vehicles, project finance vehicles, and public sector entities. Moody's defines credit risk as the risk that an entity may not meet its contractual financial obligations as they become due and any estimated financial loss in the event of default or impairment. The contractual financial obligations<sup>2</sup> addressed by Moody's ratings are those that call for, without regard to enforceability, the payment of an ascertainable amount, which may vary based upon standard sources of variation (e.g., floating interest rates), by an ascertainable date. Moody's rating addresses the issuer's ability to obtain cash sufficient to service the obligation, and its willingness to pay.<sup>3</sup> Moody's ratings do not address non-standard sources of variation in the amount of the principal obligation (e.g., equity indexed), absent an express statement to the contrary in a press release accompanying an initial rating.<sup>4</sup> Long-term ratings are assigned to issuers or obligations with an original maturity of one year or more and reflect both on the likelihood of a default or impairment on contractually promised payments and the expected financial loss suffered in the event of default or impairment. Short-term ratings are assigned to obligations with an original maturity of thirteen months or less and reflect both on the likelihood of a default or impairment on contractually promised payments and the expected financial loss suffered in the event of default or impairment.<sup>5,6</sup> Moody's issues ratings at the issuer level and instrument level on both the long-term scale and the short-term scale. Typically, ratings are made publicly available, although private and unpublished ratings may also be assigned.

Moody's differentiates structured finance ratings from fundamental ratings (i.e., ratings on nonfinancial corporate, financial institution, and public sector entities) on the global long-term scale by adding (sf) to all structured finance ratings.<sup>7</sup> The addition of (sf) to structured finance ratings should eliminate any presumption that such ratings and fundamental ratings at the same letter grade level will behave the same. The (sf) indicator for structured finance security ratings indicates that otherwise similarly rated structured finance and fundamental securities may have different risk characteristics. Through its current methodologies, however, Moody's aspires to achieve broad expected equivalence in structured finance and fundamental rating performance when measured over a long period of time.

<sup>2</sup> In the case of impairments, there can be a financial loss even when contractual obligations are met. See the definition of Impairment in this Exhibit.

<sup>3</sup> For issuer level ratings, see the definition of Issuer Ratings in this Exhibit. In some cases the relevant credit risk relates to a third party, in addition to, or instead of the issuer. Examples include credit-linked notes and guaranteed obligations.

<sup>4</sup> Because the number of possible features or structures is limited only by the creativity of issuers, Moody's cannot comprehensively catalogue all the types of non-standard variation affecting financial obligations, but examples include indexed values, equity values and cash flows, prepayment penalties, and an obligation to pay an amount that is not ascertainable at the inception of the transaction.

<sup>5</sup> For certain structured finance, preferred stock and hybrid securities in which payment default events are either not defined or do not match investors' expectations for timely payment, long-term and short-term ratings reflect the likelihood of impairment (as defined below in this publication) and financial loss in the event of impairment.

<sup>6</sup> Supranational institutions and central banks that hold sovereign debt or extend sovereign loans, such as the IMF or the European Central Bank, may not always be treated similarly to other investors and lenders with similar credit exposures. Long-term and short-term ratings assigned to obligations held by both supranational institutions and central banks, as well as other investors, reflect only the credit risks faced by other investors unless specifically noted otherwise.

<sup>7</sup> Like other global scale ratings, (sf) ratings reflect both the likelihood of a default and the expected loss suffered in the event of default. Ratings are assigned based on a rating committee's assessment of a security's expected loss rate (default probability multiplied by expected loss severity), and may be subject to the constraint that the final expected loss rating assigned would not be more than a certain number of notches, typically three to five notches, above the rating that would be assigned based on an assessment of default probability alone. The magnitude of this constraint may vary with the level of the rating, the seasoning of the transaction, and the uncertainty around the assessments of expected loss and probability of default.



### Global Long-Term Rating Scale

<b>Aaa</b>	Obligations rated Aaa are judged to be of the highest quality, subject to the lowest level of credit risk.
<b>Aa</b>	Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.
<b>A</b>	Obligations rated A are judged to be upper-medium grade and are subject to low credit risk.
<b>Baa</b>	Obligations rated Baa are judged to be medium-grade and subject to moderate credit risk and as such may possess certain speculative characteristics.
<b>Ba</b>	Obligations rated Ba are judged to be speculative and are subject to substantial credit risk.
<b>B</b>	Obligations rated B are considered speculative and are subject to high credit risk.
<b>Caa</b>	Obligations rated Caa are judged to be speculative of poor standing and are subject to very high credit risk.
<b>Ca</b>	Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.
<b>C</b>	Obligations rated C are the lowest rated and are typically in default, with little prospect for recovery of principal or interest.

Note: Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category. Additionally, a "(hyb)" indicator is appended to all ratings of hybrid securities issued by banks, insurers, finance companies, and securities firms.\*

Note: For more information on long-term ratings assigned to obligations in default, please see the definition "Long-Term Credit Ratings for Defaulted or Impaired Securities" in the Other Definitions section of this publication.

\* By their terms, hybrid securities allow for the omission of scheduled dividends, interest, or principal payments, which can potentially result in impairment if such an omission occurs. Hybrid securities may also be subject to contractually allowable write-downs of principal that could result in impairment. Together with the hybrid indicator, the long-term obligation rating assigned to a hybrid security is an expression of the relative credit risk associated with that security.

### Global Short-Term Rating Scale

<b>P-1</b>	Issuers (or supporting institutions) rated Prime-1 have a superior ability to repay short-term debt obligations.
<b>P-2</b>	Issuers (or supporting institutions) rated Prime-2 have a strong ability to repay short-term debt obligations.
<b>P-3</b>	Issuers (or supporting institutions) rated Prime-3 have an acceptable ability to repay short-term obligations.
<b>NP</b>	Issuers (or supporting institutions) rated Not Prime do not fall within any of the Prime rating categories.

## Standard Linkage Between the Global Long-Term and Short-Term Rating Scales

The following table indicates the long-term ratings consistent with different short-term ratings when such long-term ratings exist.<sup>8</sup>

LONG-TERM RATING	SHORT-TERM RATING
Aaa Aa1 Aa2 Aa3 A1 A2 A3 Baa1 Baa2 Baa3	Prime-1  Prime-2  Prime-3
Ba1, Ba2, Ba3 B1, B2, B3 Caa1, Caa2, Caa3 Ca, C	Not Prime

### Issuer Ratings

Issuer Ratings are opinions of the ability of entities to honor senior unsecured debt and debt like obligations.<sup>9</sup> As such, Issuer Ratings incorporate any external support that is expected to apply to all current and future issuance of senior unsecured financial obligations and contracts, such as explicit support stemming from a guarantee of all senior unsecured financial obligations and contracts, and/or implicit support for issuers subject to joint default analysis (e.g. banks and government-related issuers). Issuer Ratings do not incorporate support arrangements, such as guarantees, that apply only to specific (but not to all) senior unsecured financial obligations and contracts.

While Issuer Ratings reflect the risk that debt and debt-like claims are not serviced on a timely basis, they do not reflect the risk that a contract or other non-debt obligation will be subjected to commercial disputes. Additionally, while an issuer may have senior unsecured obligations held by both supranational institutions and central banks (e.g., IMF, European Central Bank), as well as other investors, Issuer Ratings reflect only the risks faced by other investors.

### Long-Term and Short-Term Obligation Ratings

Moody's assigns ratings to long-term and short-term financial obligations. Long-term ratings are assigned to issuers or obligations with an original maturity of one year or more and reflect both on the likelihood of a default on contractually promised payments and the expected financial loss suffered in the event of default. Short-term ratings are assigned to obligations with an original maturity of thirteen months or less and reflect both on the likelihood of a default on contractually promised payments and the expected financial loss suffered in the event of default.

<sup>8</sup> Structured finance short-term ratings are usually based either on the short-term rating of a support provider or on an assessment of cash flows available to retire the financial obligation.

<sup>9</sup> Issuer Ratings as applied to US local governments typically reflect an unlimited general obligation pledge, which may have security and structural features in some states that improve credit quality for general obligation bondholders, but not necessarily for other counterparties holding obligations that may lack such features.

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## Definition of Default

Moody's definition of default is applicable only to debt or debt-like obligations (e.g., swap agreements). Four events constitute a debt default under Moody's definition:

- a. a missed or delayed disbursement of a contractually-obligated interest or principal payment (excluding missed payments cured within a contractually allowed grace period), as defined in credit agreements and indentures;
- b. a bankruptcy filing or legal receivership by the debt issuer or obligor that will likely cause a miss or delay in future contractually-obligated debt service payments;
- c. a distressed exchange whereby 1) an issuer offers creditors a new or restructured debt, or a new package of securities, cash or assets that amount to a diminished value relative to the debt obligation's original promise and 2) the exchange has the effect of allowing the issuer to avoid a likely eventual default; or
- d. a change in the payment terms of a credit agreement or indenture imposed by the sovereign that results in a diminished financial obligation, such as a forced currency re-denomination (imposed by the debtor, or the debtor's sovereign) or a forced change in some other aspect of the original promise, such as indexation or maturity<sup>10</sup>.

We include distressed exchanges in our definition of default in order to capture credit events whereby issuers effectively fail to meet their debt service obligations but do not actually file for bankruptcy or miss an interest or principal payment. Moody's employs fundamental analysis in assessing the likelihood of future default and considers various indicators in assessing loss relative to the original promise, which may include the yield to maturity of the debt being exchanged.

Moody's definition of default does not include so-called "technical defaults," such as maximum leverage or minimum debt coverage violations, unless the obligor fails to cure the violation and fails to honor the resulting debt acceleration which may be required. For structured finance securities, technical defaults (such as breach of an overcollateralization test or certain other events of default as per the legal documentation of the issuer), or a temporary missed interest payment on a security whose terms allow for the deferral of such payments together with corresponding interest (such as PIKable securities) prior to its legal final maturity date do not constitute defaults. Also excluded are payments owed on long-term debt obligations which are missed due to purely technical or administrative errors which are 1) not related to the ability or willingness to make the payments and 2) are cured in very short order (typically, 1-2 business days).

Finally, in select instances based on the facts and circumstances, missed payments on financial contracts or claims may be excluded if they are the result of legal disputes regarding the validity of those claims.

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<sup>10</sup> Moreover, unlike a general tax on financial wealth, the imposition of a tax by a sovereign on the coupon or principal payment on a specific class of government debt instruments (even if retroactive) would represent a default. Targeted taxation on government securities would represent a default even if the government's action were motivated by fairness or other considerations, rather than inability or unwillingness to pay.

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## Definition of Impairment

A security is impaired when investors receive – or expect to receive with near certainty – less value than would be expected if the obligor were not experiencing financial distress or otherwise prevented from making payments by a third party, even if the indenture or contractual agreement does not provide the investor with a natural remedy for such events, such as the right to press for bankruptcy.

Moody's definition of impairment is applicable to debt, preferred stock, and other hybrid securities. A security is deemed to be impaired if:

- a. all events that meet the definition of default (above);
- b. contractually-allowable payment omissions of scheduled dividends, interest or principal payments on debt, preferred stock or other hybrid instruments<sup>11</sup> or contractually allowable interruptions of interest payments to similar structured finance instruments<sup>12</sup>;
- c. downgrades to Ca or C, signaling the near certain expectation of a significant level of future losses;
- d. write-downs or "impairment distressed exchanges"<sup>13</sup> on debt, preferred stock or other hybrid instruments due to financial distress whereby (1) the principal promise to an investor is reduced according to the terms of the indenture or other governing agreement<sup>14</sup>, or (2) an obligor offers investors a new or restructured debt, or a new package of securities, cash or assets and the exchange has the effect of allowing the obligor to avoid a contractually-allowable payment omission as described in (b) above<sup>15</sup>.

The impairment status of a security may change over time as it migrates from impaired to cured (e.g., if initially deferred cumulative preferred dividends are ultimately paid in full) and possibly back again to impaired.

## Credit Rating Histories

The credit rating histories required to be disclosed pursuant to 17 CFR 17g-7(b) are located on Moody's website, [www.moodys.com](http://www.moodys.com), at the following URL: <https://www.moodys.com/Pages/reg001004.aspx>.

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<sup>11</sup> For example, a debt security would become impaired when an obligor exercises a payment-in-kind option on a toggle bond. Examples of impairment events on non-debt securities include dividend omissions on preferred stock (both cumulative and non-cumulative), coupon omissions on other hybrid debt securities, and write downs or conversions to equity of contingent capital securities (CoCos). Excluded from impairment events are 1) missed payments due to purely technical or administrative errors which are not related to the ability or willingness to make the payments and 2) are cured in very short order (typically, 1-2 business days after the error is recognized).

<sup>12</sup> Moody's studies of historical impairments are likely to focus on those impairments that are sustained and not cured. Among some structured finance asset classes, where cure rates within a 12-month time frame can be high, many impairments are not likely to be included in impairment studies.

<sup>13</sup> Impairment distressed exchanges are similar to default distressed exchanges except that they have the effect of avoiding an impairment event, rather than a default event.

<sup>14</sup> While contractually-allowable principal write-downs on structured finance securities are impairments, failures to pay principal as contractually required are defaults. Once written down, complete cures, in which securities are written back up to their original balances are extraordinarily rare; moreover, in most cases, a write-down of principal leads to an immediate and permanent loss of interest for investors, since the balance against which interest is calculated has been reduced.

<sup>15</sup> Examples of such impairments include mandatory conversions of contingent capital securities to common equity and mandatory write-downs of other hybrid securities that are the direct result of obligor distress.