

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, 2022, are provided in the Transition/Default Matrices on the following pages, pp. 1-25 (the "Matrices").¹ 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, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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Ratings Outstanding	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca	C	Default	Paid Off	Withdrawn (other)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	41	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	25	0%	88%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Aa2	75	0%	5%	89%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa3	170	0%	0%	1%	96%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
A1	279	0%	0%	0%	0%	92%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
A2	177	0%	0%	1%	0%	16%	80%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%
A3	208	0%	0%	0%	0%	0%	4%	88%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%
Baa1	203	0%	0%	0%	0%	0%	0%	7%	80%	7%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%
Baa2	119	0%	0%	0%	0%	0%	1%	0%	7%	84%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	7%
Baa3	146	0%	0%	0%	0%	0%	0%	0%	0%	3%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	5%
Ba1	61	0%	0%	0%	0%	0%	0%	0%	0%	5%	5%	61%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	2%	11%
Ba2	73	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	81%	3%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	5%
Ba3	65	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	14%	69%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	2%
B1	62	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	55%	2%	0%	0%	0%	0%	0%	0%	8%	0%	21%
B2	79	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	5%	43%	29%	0%	0%	0%	0%	0%	11%	0%	10%
B3	57	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	4%	2%	46%	11%	2%	0%	5%	0%	19%	0%	7%
Caa1	20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%	5%	50%	5%	5%	0%	0%	5%	5%	10%
Caa2	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	21%	14%	36%	0%	0%	0%	0%	0%	21%
Caa3	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	57%	0%	0%	14%	14%	0%
Ca	-																								
C	-																								
Total	1,881																								

¹ 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, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2019 - 12/31/2022 (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	37	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%
Aa1	28	0%	71%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%
Aa2	68	0%	6%	76%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%
Aa3	178	0%	0%	4%	80%	11%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%
A1	260	0%	0%	0%	5%	80%	7%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%
A2	167	0%	0%	0%	1%	17%	66%	6%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	3%
A3	221	0%	0%	0%	0%	5%	10%	64%	6%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	6%
Baa1	172	0%	0%	0%	0%	2%	2%	12%	68%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	9%
Baa2	137	0%	0%	0%	1%	4%	1%	7%	13%	48%	12%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	10%
Baa3	136	0%	0%	0%	0%	0%	0%	1%	6%	13%	45%	6%	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%	4%	6%	14%
Ba1	59	0%	0%	0%	0%	0%	0%	0%	0%	14%	10%	27%	8%	12%	0%	0%	0%	0%	0%	0%	0%	0%	7%	3%	19%
Ba2	66	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	11%	45%	11%	0%	2%	0%	0%	0%	0%	0%	0%	8%	6%	15%
Ba3	68	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	4%	26%	31%	1%	0%	0%	0%	0%	0%	0%	0%	12%	0%	19%
B1	54	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	6%	4%	22%	26%	2%	4%	0%	0%	0%	0%	0%	11%	6%	17%
B2	88	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	15%	26%	23%	1%	0%	0%	0%	0%	11%	7%	15%
B3	50	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	8%	16%	34%	10%	0%	2%	0%	0%	6%	0%	22%
Caa1	42	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	2%	2%	14%	17%	5%	2%	7%	0%	14%	2%	29%
Caa2	30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	13%	7%	3%	7%	0%	0%	17%	7%	43%
Caa3	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	33%	33%
Ca	-																								
C	-																								
Total	1,864																								

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

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2012 - 12/31/2022 (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	50	64%	4%	4%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	4%
Aa1	34	0%	29%	26%	6%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	3%
Aa2	55	0%	0%	16%	38%	2%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	2%
Aa3	116	0%	4%	16%	16%	29%	8%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	13%
A1	118	0%	0%	3%	10%	31%	12%	19%	3%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	9%	11%
A2	287	0%	0%	0%	23%	30%	9%	9%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	8%
A3	191	0%	0%	2%	4%	6%	17%	19%	11%	2%	2%	1%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	15%	17%
Baa1	126	0%	0%	0%	6%	4%	10%	11%	13%	4%	3%	3%	6%	3%	0%	1%	0%	0%	0%	0%	0%	0%	2%	5%	27%
Baa2	176	0%	0%	0%	1%	2%	6%	11%	11%	6%	10%	2%	3%	0%	0%	1%	3%	0%	0%	0%	0%	0%	2%	19%	23%
Baa3	159	0%	0%	0%	0%	1%	3%	4%	9%	12%	8%	2%	6%	1%	0%	1%	1%	1%	0%	0%	0%	0%	3%	17%	33%
Ba1	72	0%	0%	0%	0%	0%	1%	7%	10%	13%	6%	3%	1%	3%	1%	0%	1%	3%	0%	0%	0%	0%	3%	14%	35%
Ba2	62	0%	0%	0%	0%	2%	0%	0%	2%	3%	10%	3%	3%	5%	3%	2%	0%	8%	5%	0%	0%	0%	8%	10%	40%
Ba3	101	0%	0%	0%	0%	2%	1%	0%	1%	3%	2%	2%	5%	5%	2%	1%	1%	1%	0%	2%	0%	0%	13%	13%	47%
B1	71	0%	0%	0%	0%	0%	0%	0%	0%	6%	4%	4%	3%	0%	4%	0%	4%	0%	0%	0%	0%	0%	13%	10%	52%
B2	77	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	4%	1%	6%	6%	1%	0%	0%	0%	1%	0%	22%	9%	45%
B3	87	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	2%	3%	5%	7%	1%	0%	0%	2%	0%	0%	22%	6%	51%
Caa1	39	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	5%	0%	26%	3%	64%
Caa2	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	29%	0%	0%	0%	0%	41%	6%	18%
Caa3	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%
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	-																								
Total	1,841																								

Insurance Companies

Insurance Companies - 1-Year Transition and Default Rates

(December 31, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2021 - 12/31/2022 (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%	3%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
Aa3	99	0%	0%	0%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
A1	133	0%	0%	1%	0%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A2	200	0%	0%	0%	1%	3%	92%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
A3	128	0%	0%	0%	0%	0%	6%	87%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%
Baa1	72	0%	0%	0%	0%	3%	1%	10%	79%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%
Baa2	69	0%	0%	0%	0%	0%	0%	0%	13%	83%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
Baa3	36	0%	0%	0%	0%	0%	0%	0%	0%	17%	69%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	8%
Ba1	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%
Ba2	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba3	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	67%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B1	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	50%
B3	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%
Caa1	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	80%	0%	0%	0%	0%	0%	0%	20%
Caa2	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	86%	0%	0%	0%	0%	0%	0%
Caa3	-																								
Ca	-																								
C	-																								
Total	863																								

Insurance Companies - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2019 - 12/31/2022 (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	5	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	62	0%	3%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
Aa3	100	0%	0%	0%	92%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	4%
A1	125	0%	0%	1%	2%	93%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
A2	200	1%	0%	1%	2%	5%	78%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
A3	122	0%	0%	0%	0%	2%	14%	70%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	6%
Baa1	69	0%	0%	0%	0%	3%	3%	14%	61%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	9%
Baa2	71	0%	0%	0%	0%	0%	0%	0%	21%	62%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	10%
Baa3	34	0%	0%	0%	0%	0%	0%	0%	3%	18%	44%	3%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	15%
Ba1	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	12%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%
Ba2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	33%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%
Ba3	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%
B1	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	33%	0%	0%	0%	0%	0%	0%	0%	33%
B2	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	71%
B3	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	20%	0%	0%	0%	0%	0%	0%	70%
Caa1	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	67%
Caa2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	83%	0%	0%	0%	0%	0%	0%
Caa3	-																								
Ca	-																								
C	-																								
Total	861																								

Insurance Companies - 10-Year Transition and Default Rates

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2012 - 12/31/2022 (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	13	0%	85%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%
Aa2	68	0%	3%	62%	24%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%
Aa3	74	0%	0%	1%	57%	14%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	16%
A1	124	0%	0%	1%	21%	35%	15%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	21%
A2	238	0%	0%	0%	1%	23%	34%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	27%
A3	134	0%	0%	0%	2%	3%	28%	27%	8%	1%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	5%	23%
Baa1	44	0%	0%	0%	0%	2%	9%	16%	25%	14%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	23%
Baa2	69	0%	0%	0%	0%	3%	0%	7%	23%	26%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	17%
Baa3	48	0%	0%	0%	0%	2%	0%	6%	6%	27%	13%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	19%	21%
Ba1	9	0%	0%	0%	0%	0%	0%	0%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	67%
Ba2	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	75%
Ba3	13	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	77%
B1	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%	11%	78%
B2	19	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	95%
B3	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	90%
Caa1	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	75%
Caa2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	50%	17%
Caa3	2	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	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%
C	-																								
Total	899																								

Corporate Issuers

Corporate Issuers - 1-Year Transition and Default Rates

(December 31, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2021 - 12/31/2022 (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	10	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	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	45	0%	0%	98%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
Aa3	39	0%	0%	10%	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A1	162	0%	0%	0%	1%	96%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
A2	263	0%	0%	0%	0%	2%	95%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
A3	338	0%	0%	0%	0%	0%	3%	89%	3%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%
Baa1	496	0%	0%	0%	0%	0%	0%	5%	88%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	2%
Baa2	598	0%	0%	0%	0%	0%	0%	1%	7%	84%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	2%
Baa3	466	0%	0%	0%	0%	0%	0%	0%	0%	10%	79%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	4%
Ba1	117	0%	0%	0%	0%	0%	0%	0%	0%	1%	9%	67%	9%	0%	3%	0%	0%	1%	0%	0%	0%	0%	2%	5%	3%
Ba2	133	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	12%	65%	4%	4%	1%	0%	0%	2%	0%	0%	0%	0%	8%	3%
Ba3	163	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	12%	68%	5%	4%	0%	1%	1%	0%	0%	0%	2%	6%	1%
B1	143	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	14%	64%	4%	4%	1%	0%	0%	0%	0%	3%	7%	3%
B2	106	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	8%	61%	15%	1%	0%	1%	0%	0%	3%	6%	5%
B3	125	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	14%	54%	10%	1%	0%	0%	0%	10%	5%	2%
Caa1	109	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	12%	61%	9%	2%	0%	0%	6%	7%	1%
Caa2	75	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	3%	76%	8%	3%	3%	1%	3%	0%
Caa3	21	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	33%	10%	0%	19%	19%	0%
Ca	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	80%	0%	0%
C	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	50%	25%	0%
Total	3,425																								

Corporate Issuers - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2019 - 12/31/2022 (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	53%	0%	47%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa1	6	17%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa2	41	0%	7%	80%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%
Aa3	49	0%	0%	8%	55%	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	2%
A1	168	0%	0%	0%	2%	67%	22%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	4%
A2	236	0%	0%	0%	0%	4%	72%	14%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	1%
A3	353	0%	0%	0%	0%	2%	10%	65%	14%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%	4%
Baa1	492	0%	0%	0%	0%	0%	0%	5%	67%	13%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	3%
Baa2	552	0%	0%	0%	0%	0%	0%	2%	11%	64%	7%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	9%	5%
Baa3	426	0%	0%	0%	0%	0%	0%	0%	1%	15%	50%	4%	3%	1%	1%	0%	0%	0%	0%	0%	0%	0%	1%	14%	9%
Ba1	142	0%	0%	0%	0%	0%	0%	0%	0%	6%	16%	25%	12%	6%	3%	1%	0%	1%	0%	0%	0%	0%	0%	17%	12%
Ba2	147	0%	0%	0%	0%	0%	0%	0%	0%	1%	5%	14%	25%	11%	3%	2%	1%	1%	1%	0%	0%	0%	3%	17%	16%
Ba3	153	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	2%	12%	37%	10%	3%	3%	0%	1%	0%	0%	0%	1%	25%	4%
B1	149	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	7%	13%	22%	13%	6%	1%	0%	1%	0%	0%	7%	19%	10%
B2	123	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%	9%	24%	15%	10%	2%	0%	1%	0%	17%	15%	2%
B3	146	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%	8%	8%	18%	7%	8%	1%	1%	0%	15%	24%	6%
Caa1	92	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	10%	18%	8%	1%	0%	0%	16%	39%	4%
Caa2	91	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	7%	20%	4%	1%	0%	32%	30%	2%
Caa3	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	7%	0%	73%	13%	0%
Ca	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	88%	0%	0%	0%
C	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%
Total	3,407																								

Corporate Issuers - 10-Year Transition and Default Rates

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2012 - 12/31/2022 (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	41%	0%	41%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	6%
Aa1	26	0%	12%	38%	8%	23%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	12%
Aa2	24	0%	0%	13%	33%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	8%
Aa3	77	0%	3%	6%	12%	40%	8%	6%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	5%
A1	151	0%	0%	11%	4%	23%	25%	7%	3%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	7%
A2	190	0%	0%	0%	1%	6%	38%	13%	9%	5%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	21%	6%
A3	297	0%	0%	0%	1%	1%	12%	25%	21%	6%	1%	2%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	18%	11%
Baa1	392	0%	0%	0%	0%	1%	3%	16%	28%	17%	4%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	22%	7%
Baa2	438	0%	0%	0%	0%	0%	1%	7%	21%	24%	11%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	22%	10%
Baa3	378	0%	0%	0%	0%	0%	0%	2%	8%	20%	14%	4%	3%	2%	1%	1%	0%	0%	1%	0%	0%	0%	2%	29%	14%
Ba1	123	0%	0%	0%	0%	0%	0%	2%	3%	8%	14%	8%	6%	2%	0%	0%	2%	0%	0%	0%	0%	0%	1%	43%	11%
Ba2	123	0%	0%	1%	0%	0%	0%	0%	1%	7%	6%	5%	6%	5%	1%	2%	4%	0%	1%	0%	0%	0%	7%	46%	8%
Ba3	111	0%	0%	0%	0%	0%	0%	0%	0%	5%	5%	1%	3%	6%	7%	2%	1%	2%	0%	1%	0%	0%	10%	44%	13%
B1	154	0%	0%	0%	0%	0%	0%	1%	0%	1%	6%	3%	3%	7%	3%	2%	3%	2%	1%	1%	0%	0%	11%	50%	8%
B2	108	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	6%	3%	6%	7%	3%	1%	0%	0%	1%	0%	17%	42%	12%
B3	211	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	3%	2%	3%	2%	1%	2%	0%	0%	0%	23%	50%	11%
Caa1	173	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	1%	1%	0%	0%	0%	24%	66%	6%
Caa2	63	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%	6%	2%	0%	0%	0%	0%	27%	56%	5%
Caa3	21	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	5%	0%	0%	0%	29%	48%	14%
Ca	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	0%	30%
C	-																								
Total	3,087																								

Residential Mortgage Backed Securities (RMBS)

RMBS - 1-Year Transition and Default Rates

(December 31, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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	2,456	84%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%
Aa1	623	17%	68%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	1%
Aa2	331	19%	13%	52%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	1%	
Aa3	456	7%	10%	8%	61%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	1%	
A1	409	1%	2%	13%	6%	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	2%	
A2	463	0%	2%	4%	12%	30%	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	3%	
A3	310	0%	1%	2%	8%	14%	15%	52%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	2%	
Baa1	318	0%	0%	1%	1%	5%	13%	5%	45%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	14%	
Baa2	257	0%	0%	0%	1%	3%	5%	14%	4%	60%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	3%	
Baa3	388	0%	0%	0%	0%	1%	1%	6%	14%	5%	62%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	2%	
Ba1	268	0%	0%	0%	1%	0%	0%	0%	5%	13%	7%	57%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	9%	6%	
Ba2	331	0%	0%	0%	0%	0%	0%	0%	1%	2%	10%	5%	70%	0%	1%	0%	0%	0%	0%	0%	0%	0%	6%	5%	
Ba3	290	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	14%	4%	65%	1%	2%	0%	0%	0%	0%	0%	0%	5%	6%	
B1	889	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	1%	77%	0%	1%	0%	0%	0%	0%	0%	11%	4%	
B2	293	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	6%	1%	72%	0%	4%	0%	0%	0%	0%	9%	4%	
B3	296	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	8%	2%	77%	3%	1%	0%	0%	0%	3%	5%	
Caa1	372	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%	0%	82%	0%	0%	0%	0%	4%	9%	
Caa2	380	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	4%	1%	84%	0%	0%	0%	1%	2%	7%
Caa3	493	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	90%	0%	0%	2%	5%	
Ca	1,113	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	96%	0%	1%	2%	
C	539	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	92%	1%	1%	4%	
Total	11,275																								

RMBS - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2019 - 12/31/2022 (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	2,382	47%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	51%	2%
Aa1	582	21%	38%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	2%
Aa2	360	31%	11%	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	4%
Aa3	370	22%	9%	5%	24%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36%	3%
A1	422	10%	10%	12%	3%	36%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	3%
A2	459	6%	7%	5%	7%	27%	20%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	4%
A3	394	2%	4%	6%	6%	7%	9%	15%	1%	2%	1%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	30%	16%
Baa1	348	1%	1%	5%	5%	5%	9%	2%	20%	2%	2%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	24%	20%
Baa2	311	0%	1%	3%	7%	8%	5%	8%	4%	18%	1%	2%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	33%	9%
Baa3	466	0%	0%	1%	2%	2%	4%	5%	7%	3%	20%	2%	7%	0%	4%	1%	0%	0%	0%	0%	0%	0%	0%	27%	13%
Ba1	477	0%	0%	0%	1%	1%	1%	2%	3%	6%	6%	17%	5%	3%	11%	1%	0%	0%	0%	0%	0%	0%	0%	30%	15%
Ba2	350	0%	0%	0%	0%	1%	0%	2%	5%	2%	8%	6%	21%	2%	14%	0%	0%	0%	0%	0%	0%	0%	0%	25%	14%
Ba3	374	0%	0%	0%	1%	1%	0%	0%	1%	2%	3%	9%	2%	21%	19%	4%	0%	1%	0%	0%	0%	0%	0%	22%	13%
B1	794	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	4%	1%	57%	1%	1%	1%	0%	0%	0%	0%	2%	20%	11%
B2	315	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	4%	4%	5%	1%	42%	1%	5%	0%	0%	0%	0%	4%	18%	11%
B3	333	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	2%	2%	2%	9%	0%	45%	7%	1%	0%	0%	0%	3%	14%	13%
Caa1	524	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	2%	0%	50%	0%	1%	0%	0%	5%	19%	18%
Caa2	508	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	3%	1%	60%	0%	1%	0%	7%	8%	17%
Caa3	594	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	1%	71%	2%	0%	6%	4%	12%
Ca	1,221	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	85%	0%	3%	4%	5%
C	680	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	72%	10%	8%	8%
Total	12,264																								

RMBS - 10-Year Transition and Default Rates
(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2012 - 12/31/2022 (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	2,081	15%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	10%
Aa1	446	6%	2%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	76%	12%
Aa2	543	1%	4%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	69%	22%
Aa3	745	2%	2%	1%	1%	19%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	59%	14%
A1	885	1%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	64%	29%
A2	846	1%	1%	0%	3%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	69%	21%
A3	763	1%	7%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	59%	27%
Baa1	968	0%	5%	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	55%	31%
Baa2	826	1%	2%	1%	1%	1%	2%	1%	1%	1%	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	52%	34%
Baa3	893	1%	1%	0%	1%	0%	1%	0%	0%	0%	1%	1%	1%	1%	1%	0%	0%	1%	0%	0%	0%	0%	1%	47%	41%
Ba1	868	1%	1%	1%	0%	0%	1%	0%	1%	0%	1%	0%	1%	0%	1%	1%	0%	1%	0%	0%	0%	0%	3%	46%	41%
Ba2	761	1%	2%	1%	0%	0%	0%	1%	1%	0%	1%	1%	1%	0%	1%	0%	1%	1%	0%	0%	0%	0%	2%	45%	40%
Ba3	974	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	2%	1%	0%	2%	0%	0%	0%	0%	3%	37%	49%
B1	932	1%	1%	1%	0%	1%	0%	0%	0%	1%	1%	0%	1%	0%	3%	1%	1%	1%	0%	0%	0%	0%	5%	41%	41%
B2	1,038	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	1%	1%	0%	2%	1%	0%	1%	0%	0%	0%	0%	8%	41%	40%
B3	1,283	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	1%	2%	1%	4%	1%	2%	2%	1%	0%	1%	0%	14%	31%	37%
Caa1	1,978	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	2%	0%	1%	3%	1%	1%	1%	0%	34%	21%	31%
Caa2	2,442	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	2%	0%	1%	2%	5%	1%	2%	0%	42%	17%	23%
Caa3	2,165	1%	0%	1%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	3%	1%	1%	2%	2%	13%	4%	0%	38%	12%	16%
Ca	3,248	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	1%	1%	1%	2%	1%	24%	1%	30%	15%	16%
C	5,457	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	1%	1%	1%	1%	1%	2%	8%	55%	11%	11%
Total	30,142																								

Commercial Mortgage Backed Securities (CMBS)

CMBS - 1-Year Transition and Default Rates

(December 31, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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	1,837	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	84	5%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%
Aa2	188	1%	3%	88%	1%	1%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%
Aa3	264	1%	6%	11%	75%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%
A1	64	0%	0%	9%	11%	58%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	0%
A2	67	0%	0%	1%	1%	9%	64%	1%	6%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%
A3	180	1%	0%	1%	3%	12%	9%	62%	2%	2%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%
Baa1	60	0%	0%	0%	0%	2%	3%	18%	52%	7%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%
Baa2	57	0%	0%	0%	0%	2%	4%	5%	7%	67%	2%	9%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Baa3	136	1%	0%	0%	0%	0%	1%	4%	15%	15%	48%	3%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%
Ba1	39	0%	0%	0%	0%	0%	0%	3%	0%	3%	3%	51%	8%	18%	0%	3%	0%	0%	0%	0%	0%	0%	0%	13%	0%
Ba2	37	0%	0%	0%	0%	0%	0%	0%	0%	3%	5%	3%	59%	3%	16%	0%	3%	0%	0%	0%	0%	0%	0%	8%	0%
Ba3	68	1%	0%	0%	0%	0%	0%	0%	0%	0%	3%	7%	21%	43%	6%	3%	1%	0%	3%	0%	0%	0%	0%	12%	0%
B1	30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	3%	0%	40%	7%	23%	3%	0%	0%	0%	0%	0%	17%	0%
B2	35	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	9%	11%	49%	9%	11%	3%	0%	0%	0%	0%	6%	0%
B3	65	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	15%	49%	3%	11%	2%	0%	0%	0%	15%	0%
Caa1	36	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	42%	11%	22%	0%	0%	0%	22%	0%
Caa2	31	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	68%	23%	0%	3%	3%	3%	0%
Caa3	55	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	62%	7%	13%	4%	13%	0%
Ca	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	80%	7%	7%	7%	0%
C	48	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	77%	13%	10%	0%
Total	3,396																								

CMBS - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2019 - 12/31/2022 (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	1,906	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	0%
Aa1	79	4%	61%	0%	1%	1%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	0%
Aa2	162	1%	2%	78%	2%	1%	0%	1%	2%	0%	0%	1%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	12%	0%
Aa3	256	2%	5%	4%	62%	2%	4%	1%	1%	2%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%
A1	77	0%	1%	4%	9%	34%	3%	6%	8%	0%	0%	0%	3%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	30%	0%
A2	71	0%	0%	0%	3%	10%	41%	6%	3%	0%	0%	3%	0%	1%	1%	0%	1%	1%	1%	3%	0%	0%	0%	25%	0%
A3	169	1%	0%	2%	3%	4%	5%	42%	5%	5%	2%	5%	1%	2%	2%	2%	1%	0%	1%	1%	0%	0%	0%	17%	0%
Baa1	63	0%	0%	0%	0%	2%	3%	16%	21%	3%	3%	3%	2%	0%	2%	3%	0%	2%	0%	2%	0%	2%	0%	38%	0%
Baa2	53	0%	0%	0%	0%	0%	2%	2%	8%	51%	2%	0%	0%	2%	2%	0%	4%	2%	0%	2%	0%	0%	0%	25%	0%
Baa3	133	1%	0%	0%	0%	1%	1%	4%	4%	11%	30%	8%	4%	1%	2%	0%	4%	4%	2%	5%	0%	1%	0%	20%	1%
Ba1	40	0%	0%	0%	0%	3%	0%	3%	5%	0%	0%	13%	5%	3%	0%	3%	3%	5%	0%	10%	3%	0%	8%	38%	3%
Ba2	58	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	14%	5%	7%	5%	2%	2%	17%	7%	0%	3%	0%	28%	9%
Ba3	61	2%	0%	0%	0%	0%	0%	0%	0%	0%	2%	3%	5%	23%	5%	8%	2%	2%	0%	7%	0%	7%	2%	34%	0%
B1	44	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	2%	0%	0%	5%	0%	7%	2%	2%	5%	2%	9%	16%	45%	0%
B2	52	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%	0%	0%	4%	6%	12%	6%	4%	8%	12%	6%	8%	10%	23%	0%
B3	56	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	5%	2%	23%	4%	13%	7%	2%	2%	9%	32%	0%
Caa1	42	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%	10%	0%	2%	0%	17%	21%	43%	0%
Caa2	24	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	33%	42%	0%
Caa3	48	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	27%	0%	2%	40%	29%	0%
Ca	24	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	42%	0%	33%	21%	4%	0%
C	54	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	39%	44%	17%	0%	0%
Total	3,472																								

CMBS - 10-Year Transition and Default Rates
(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																						Other Outcomes During 12/31/2012 - 12/31/2022 (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	1,505	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	98%	0%	
Aa1	116	1%	1%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	95%	0%	
Aa2	233	0%	1%	2%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	93%	0%	
Aa3	186	0%	0%	1%	0%	2%	1%	3%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	90%	1%	
A1	156	0%	1%	0%	5%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	90%	0%	
A2	209	0%	0%	0%	0%	1%	3%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	90%	0%	
A3	195	0%	0%	1%	0%	0%	0%	1%	0%	0%	1%	1%	0%	1%	1%	1%	0%	1%	1%	1%	0%	0%	1%	93%	0%	
Baa1	189	0%	0%	0%	1%	0%	0%	1%	0%	1%	4%	1%	1%	1%	1%	0%	0%	1%	0%	1%	0%	1%	1%	88%	1%	
Baa2	220	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	2%	90%	0%	
Baa3	322	0%	0%	0%	0%	0%	0%	0%	1%	2%	1%	2%	0%	0%	1%	0%	1%	1%	0%	3%	0%	0%	4%	84%	0%	
Ba1	214	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	90%	0%	
Ba2	202	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	3%	2%	0%	3%	10%	77%	0%	
Ba3	164	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	1%	9%	88%	1%	
B1	177	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	0%	0%	0%	10%	87%	1%	
B2	211	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	2%	2%	3%	16%	73%	0%	
B3	230	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	77%	0%	
Caa1	228	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	31%	66%	0%	
Caa2	259	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	2%	0%	0%	0%	36%	60%	1%	
Caa3	418	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	1%	46%	48%	1%	
Ca	234	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%	67%	28%	1%	
C	560	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	82%	15%	0%	
Total	6,228																									

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, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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	2,215	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%
Aa1	210	32%	58%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%
Aa2	1,302	5%	14%	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%
Aa3	30	10%	30%	10%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%
A1	81	0%	10%	14%	33%	36%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%
A2	1,072	0%	0%	0%	3%	12%	81%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
A3	47	0%	0%	2%	4%	9%	9%	64%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%
Baa1	31	0%	0%	0%	0%	10%	10%	26%	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
Baa2	161	0%	0%	0%	0%	1%	1%	2%	28%	60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%
Baa3	860	0%	0%	0%	0%	0%	0%	0%	0%	4%	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%
Ba1	68	0%	0%	0%	0%	0%	0%	0%	0%	1%	19%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%
Ba2	209	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
Ba3	854	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	95%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
B1	140	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	7%	79%	2%	0%	0%	0%	1%	0%	0%	0%	11%	0%
B2	151	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	9%	83%	5%	0%	0%	0%	0%	0%	0%	3%	0%
B3	299	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	95%	0%	0%	0%	0%	0%	0%	0%	3%	0%
Caa1	48	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	75%	0%	0%	0%	0%	4%	13%	0%
Caa2	38	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	76%	8%	0%	0%	0%	16%	0%
Caa3	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	7%	0%	47%	0%	0%	7%	27%	0%
Ca	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%
C	-																								
Total	7,833																								

CLOs - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2019 - 12/31/2022 (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	1,975	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	63%	0%
Aa1	126	18%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	0%
Aa2	1,123	10%	16%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	49%	0%
Aa3	21	0%	10%	0%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	62%	0%
A1	47	13%	4%	11%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	0%
A2	960	2%	1%	1%	4%	12%	34%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	46%	0%
A3	27	0%	4%	0%	0%	0%	4%	30%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	56%	0%
Baa1	22	5%	5%	9%	5%	0%	0%	5%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	68%	0%
Baa2	204	0%	1%	0%	0%	0%	1%	3%	20%	32%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%
Baa3	736	0%	0%	0%	0%	1%	1%	1%	2%	4%	43%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	0%
Ba1	4	0%	0%	0%	0%	50%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba2	247	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	61%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	35%	0%
Ba3	731	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	49%	11%	0%	1%	1%	0%	0%	0%	0%	1%	35%	0%
B1	49	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	6%	33%	10%	2%	2%	0%	0%	0%	0%	6%	39%	0%
B2	226	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	46%	8%	2%	1%	0%	0%	0%	1%	33%	0%
B3	214	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	39%	14%	13%	4%	0%	0%	2%	26%	0%
Caa1	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	25%	63%	0%
Caa2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	33%	50%	0%
Caa3	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	71%	29%	0%
Ca	-																								
C																									
Total	6,733																								

CLOs - 10-Year Transition and Default Rates
(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022(Percent)																				Other Outcomes During 12/31/2012 - 12/31/2022 (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	1,280	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Aa1	338	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	167	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Aa3	151	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	144	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	162	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
A3	176	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	136	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Baa2	135	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Baa3	178	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	265	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Ba2	234	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Ba3	207	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	174	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	97%	0%
B2	26	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	88%	0%
B3	18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Caa1	17	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	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Caa3	18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	89%	0%
Ca	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	83%	0%
C	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%
Total	3,862																								

Collateralized Debt Obligations (CDOs)

CDOs - 1-Year Transition and Default Rates

(December 31, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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	166	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	59	19%	76%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%
Aa2	70	4%	17%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Aa3	49	2%	6%	18%	69%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
A1	22	0%	5%	9%	14%	68%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%
A2	39	0%	0%	3%	8%	5%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%
A3	55	2%	0%	0%	0%	7%	5%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%
Baa1	15	0%	0%	0%	0%	0%	13%	0%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%
Baa2	17	0%	0%	0%	0%	6%	6%	0%	24%	59%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
Baa3	54	0%	0%	0%	0%	0%	0%	2%	7%	13%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
Ba1	26	0%	0%	0%	0%	0%	0%	0%	0%	15%	8%	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba2	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba3	48	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	94%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
B1	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	33%	0%	42%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%
B2	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B3	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	64%	0%	0%	0%	0%	0%	7%	14%	0%
Caa1	11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Caa2	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	0%	40%	0%	0%	0%	0%	0%	0%
Caa3	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	67%	0%	0%	0%	22%	0%
Ca	53	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	89%	0%	0%	9%	0%
C	144	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	86%	3%	3%	7%
Total	890																								

CDOs - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2019 - 12/31/2022 (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	160	41%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	56%	3%
Aa1	57	30%	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	2%
Aa2	54	6%	20%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	48%	0%
Aa3	51	2%	20%	27%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	0%
A1	25	4%	0%	28%	16%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	0%
A2	37	0%	3%	3%	8%	8%	35%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	41%	0%
A3	45	0%	0%	4%	4%	9%	9%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	51%	0%
Baa1	11	0%	0%	0%	9%	0%	36%	9%	27%	0%	0%	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%
Baa2	19	5%	0%	0%	0%	11%	11%	0%	11%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	0%
Baa3	50	0%	0%	0%	0%	0%	0%	4%	16%	12%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	54%	0%
Ba1	19	0%	0%	0%	0%	0%	0%	0%	5%	16%	21%	47%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%
Ba2	14	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	50%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%
Ba3	38	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	8%	3%	55%	0%	0%	3%	0%	0%	0%	0%	0%	0%	26%	0%
B1	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	21%	0%	29%	0%	0%	0%	0%	0%	0%	0%	0%	36%	0%
B2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	83%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B3	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	44%	13%	0%	0%	0%	0%	6%	19%	13%
Caa1	19	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	11%	5%	11%	47%	0%	0%	0%	0%	5%	5%	11%
Caa2	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36%	0%	14%	7%	0%	0%	7%	21%	14%
Caa3	22	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	23%	0%	0%	9%	18%	45%
Ca	121	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	39%	0%	7%	5%	47%
C	269	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	46%	13%	2%	39%
Total	1,061																								

CDOs - 10-Year Transition and Default Rates

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2012 - 12/31/2022 (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	290	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	94%	4%
Aa1	60	2%	5%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	90%	2%
Aa2	47	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	94%	4%
Aa3	57	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	95%	4%
A1	66	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	95%	3%
A2	69	6%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	90%	3%
A3	67	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	84%	9%
Baa1	51	8%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	76%	4%
Baa2	69	7%	6%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	84%	1%
Baa3	58	5%	5%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	84%	2%
Ba1	84	11%	2%	2%	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	79%	2%
Ba2	99	3%	7%	5%	5%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	73%	4%
Ba3	50	2%	4%	0%	2%	4%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	86%	0%
B1	60	3%	5%	8%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	73%	8%
B2	52	0%	4%	2%	2%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	87%	2%
B3	44	0%	0%	9%	2%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	2%	73%	11%
Caa1	61	0%	2%	0%	0%	2%	2%	2%	0%	0%	0%	8%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	8%	72%	3%
Caa2	99	1%	3%	3%	0%	0%	2%	0%	1%	3%	0%	3%	0%	2%	0%	0%	0%	4%	2%	1%	0%	0%	4%	65%	6%
Caa3	234	0%	0%	1%	2%	1%	1%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	6%	71%	13%
Ca	522	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	1%	7%	2%	21%	45%	16%
C	674	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	1%	0%	0%	0%	1%	16%	49%	14%	14%
Total	2,813																								

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, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)				Other Outcomes During 12/31/2021 - 12/31/2022 (Percent)		
Credit Ratings	Number of Ratings Outstanding	P-1	P-2	P-3	NP	Default	Paid Off	Withdrawn (other)
P-1	118	93%	3%	0%	0%	0%	3%	1%
P-2	2	0%	100%	0%	0%	0%	0%	0%
P-3	-							
NP	1	0%	0%	0%	100%	0%	0%	0%
Total	121							

ABCP - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)				Other Outcomes During 12/31/2019 - 12/31/2022 (Percent)		
Credit Ratings	Number of Ratings Outstanding	P-1	P-2	P-3	NP	Default	Paid Off	Withdrawn (other)
P-1	113	86%	3%	0%	0%	0%	9%	3%
P-2	2	0%	100%	0%	0%	0%	0%	0%
P-3	1	0%	0%	0%	100%	0%	0%	0%
NP	-							
Total	116							

ABCP - 10-Year Transition and Default Rates

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)				Other Outcomes During 12/31/2012 - 12/31/2022 (Percent)		
Credit Ratings	Number of Ratings Outstanding	P-1	P-2	P-3	NP	Default	Paid Off	Withdrawn (other)
P-1	117	55%	3%	0%	0%	0%	38%	4%
P-2	23	30%	4%	0%	0%	0%	39%	26%
P-3	-							
NP	-							
Total	140							

ABCP: Please note that ABCP is reported on program level instead of on tranche level. Most ABCP programs only have one tranche rating. A few programs have short-term tranches denominated in different currencies but their ratings are invariably the same. Therefore, we report only one rating for each program to avoid redundancy.

Other Asset Backed Securities (Other ABS)

Other ABS - 1-Year Transition and Default Rates

(December 31, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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	2,340	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%
Aa1	248	24%	59%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%
Aa2	191	19%	12%	46%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	0%
Aa3	194	7%	11%	6%	58%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	0%
A1	153	2%	7%	19%	8%	42%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	0%
A2	146	3%	3%	2%	8%	14%	55%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	0%
A3	103	1%	5%	4%	5%	8%	8%	46%	3%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	2%
Baa1	102	0%	0%	0%	6%	4%	8%	8%	47%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%
Baa2	122	0%	1%	4%	1%	2%	2%	8%	11%	57%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	1%
Baa3	133	0%	0%	0%	2%	1%	1%	0%	5%	8%	65%	1%	0%	1%	5%	0%	0%	0%	0%	0%	0%	0%	0%	12%	1%
Ba1	63	0%	0%	0%	2%	2%	0%	10%	2%	5%	10%	54%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	2%
Ba2	72	0%	0%	0%	0%	0%	0%	1%	3%	8%	8%	17%	53%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	1%
Ba3	38	0%	0%	0%	0%	0%	0%	3%	0%	5%	0%	8%	21%	42%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	3%
B1	45	0%	2%	0%	0%	0%	0%	0%	2%	2%	2%	0%	0%	16%	60%	2%	0%	0%	0%	0%	0%	0%	4%	4%	4%
B2	45	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	11%	11%	11%	16%	44%	0%	2%	0%	0%	0%	0%	0%	0%	2%
B3	31	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	3%	0%	0%	13%	68%	0%	0%	0%	0%	0%	0%	10%	3%
Caa1	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	13%	75%	0%	0%	0%	0%	0%	6%	
Caa2	25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	12%	72%	0%	0%	0%	4%	4%	
Caa3	29	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	90%	0%	0%	3%	0%	
Ca	18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	89%	0%	6%	0%	
C	42	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	
Total	4,156																								

Other ABS - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																						Other Outcomes During 12/31/2019 - 12/31/2022 (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	2,593	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	63%	0%	
Aa1	226	10%	35%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	52%	1%	
Aa2	211	11%	2%	16%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	66%	2%	
Aa3	251	4%	1%	2%	27%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	64%	1%	
A1	167	7%	4%	2%	5%	23%	2%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	1%	
A2	157	5%	3%	4%	3%	7%	15%	1%	0%	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	57%	0%	
A3	86	2%	2%	2%	2%	5%	7%	15%	6%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	48%	8%	
Baa1	96	13%	1%	0%	2%	0%	3%	5%	17%	6%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	52%	0%	
Baa2	138	4%	1%	1%	1%	2%	0%	1%	9%	19%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	7%	
Baa3	173	3%	1%	1%	1%	1%	2%	3%	2%	3%	34%	1%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	1%	40%	5%	
Ba1	63	5%	2%	0%	2%	2%	2%	0%	2%	5%	2%	24%	5%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	30%	19%	
Ba2	49	0%	0%	2%	0%	2%	2%	0%	0%	0%	4%	10%	16%	2%	0%	0%	0%	0%	0%	0%	0%	0%	2%	55%	4%	
Ba3	44	0%	5%	0%	2%	0%	0%	2%	0%	0%	0%	14%	14%	11%	2%	0%	0%	0%	0%	0%	0%	0%	0%	45%	5%	
B1	45	0%	4%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	7%	40%	7%	0%	0%	0%	0%	0%	0%	2%	29%	7%	
B2	59	3%	2%	2%	0%	0%	0%	3%	0%	2%	2%	5%	2%	2%	5%	14%	3%	0%	0%	0%	0%	0%	0%	47%	8%	
B3	42	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	10%	29%	2%	2%	0%	0%	0%	0%	50%	2%	
Caa1	23	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	9%	39%	17%	4%	0%	0%	0%	9%	13%	
Caa2	21	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	5%	0%	10%	52%	10%	0%	0%	0%	14%	5%	
Caa3	34	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	3%	65%	0%	0%	0%	21%	6%	
Ca	33	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	45%	3%	3%	42%	3%	
C	74	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	55%	28%	5%	11%		
Total	4,585																									

Other ABS - 10-Year Transition and Default Rates

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2012 - 12/31/2022 (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	2,312	9%	1%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	86%	0%
Aa1	219	14%	1%	0%	0%	4%	0%	1%	2%	4%	6%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	66%	0%
Aa2	227	6%	0%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	88%	2%
Aa3	286	3%	0%	0%	1%	2%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	87%	2%
A1	250	4%	0%	0%	0%	2%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	90%	0%
A2	405	6%	1%	0%	2%	1%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	81%	2%
A3	444	1%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	93%	2%
Baa1	197	2%	1%	0%	1%	1%	2%	1%	2%	4%	2%	1%	1%	0%	1%	1%	0%	0%	1%	0%	0%	0%	1%	80%	3%
Baa2	284	0%	1%	2%	1%	0%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	86%	3%
Baa3	143	1%	0%	1%	1%	0%	1%	0%	2%	1%	2%	2%	2%	0%	2%	0%	0%	0%	1%	0%	0%	0%	1%	78%	7%
Ba1	138	0%	0%	0%	0%	0%	0%	1%	1%	0%	4%	0%	1%	0%	3%	1%	0%	2%	1%	1%	0%	0%	0%	81%	4%
Ba2	126	0%	0%	0%	1%	0%	0%	0%	0%	2%	0%	5%	1%	2%	0%	1%	1%	0%	2%	6%	0%	1%	0%	75%	4%
Ba3	206	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	87%	3%
B1	114	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%	2%	1%	1%	2%	3%	0%	1%	0%	76%	9%
B2	93	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	3%	2%	8%	0%	2%	3%	0%	2%	0%	71%	8%
B3	96	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	3%	2%	2%	1%	2%	1%	70%	15%
Caa1	74	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%	4%	1%	1%	9%	3%	12%	51%	9%
Caa2	49	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	22%	55%	12%
Caa3	69	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	3%	4%	10%	71%	7%
Ca	93	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	24%	23%	42%	9%
C	103	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	8%	32%	39%	20%
Total	5,928																								

Other Structured Finance Products (Other SFPs)

Other SFPs - 1-Year Transition and Default Rates

(December 31, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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	6,399	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	711	8%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
Aa2	170	13%	10%	72%	0%	1%	1%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%
Aa3	298	0%	7%	8%	68%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%
A1	193	0%	3%	16%	9%	64%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
A2	228	0%	1%	1%	7%	14%	67%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%
A3	200	0%	0%	0%	4%	18%	12%	61%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Baa1	99	0%	0%	0%	1%	1%	2%	32%	51%	3%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	1%
Baa2	84	0%	0%	0%	0%	1%	8%	27%	4%	57%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
Baa3	112	0%	0%	0%	1%	2%	0%	12%	8%	0%	70%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Ba1	61	0%	0%	0%	0%	0%	0%	0%	0%	25%	13%	48%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
Ba2	71	0%	0%	0%	0%	0%	0%	0%	0%	13%	20%	0%	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
Ba3	49	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	6%	55%	8%	4%	0%	2%	0%	0%	0%	0%	0%	2%	2%
B1	49	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	6%	82%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%
B2	44	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	89%	0%	7%	0%	0%	0%	0%	0%	2%	2%
B3	51	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	76%	12%	2%	0%	2%	0%	0%	2%	4%
Caa1	71	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	79%	4%	0%	1%	1%	0%	3%	11%
Caa2	164	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	90%	1%	2%	1%	0%	2%	5%
Caa3	265	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	92%	2%	1%	0%	0%	6%
Ca	359	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	93%	2%	0%	1%	5%
C	283	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	90%	0%	4%	6%	6%
Total	9,961																								

Other SFPs - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																						Other Outcomes During 12/31/2019 - 12/31/2022 (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	3,373	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	2%	
Aa1	325	32%	53%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	2%	
Aa2	184	21%	13%	32%	4%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	3%	
Aa3	165	7%	7%	6%	39%	3%	5%	1%	2%	1%	1%	1%	1%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	24%	0%	
A1	205	7%	4%	5%	7%	43%	3%	2%	2%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	0%	
A2	141	4%	6%	7%	2%	16%	34%	1%	1%	1%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	26%	1%	
A3	112	21%	2%	5%	4%	9%	11%	24%	7%	2%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	0%	
Baa1	61	0%	3%	3%	3%	5%	3%	8%	30%	5%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	7%	
Baa2	68	0%	0%	0%	3%	6%	19%	12%	3%	4%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	46%	4%	
Baa3	139	0%	1%	12%	5%	12%	4%	11%	1%	3%	31%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	9%	7%	
Ba1	52	0%	0%	0%	0%	17%	0%	2%	0%	0%	13%	33%	4%	15%	0%	2%	0%	0%	0%	0%	0%	0%	0%	8%	6%	
Ba2	39	0%	0%	0%	0%	13%	0%	21%	0%	0%	15%	0%	21%	0%	8%	0%	3%	0%	0%	0%	3%	0%	0%	5%	13%	
Ba3	47	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	15%	2%	17%	4%	11%	0%	4%	2%	2%	2%	2%	0%	30%	4%	
B1	50	0%	0%	0%	0%	0%	0%	0%	2%	0%	16%	0%	2%	0%	30%	2%	20%	4%	0%	4%	8%	4%	0%	6%	2%	
B2	61	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	7%	0%	44%	3%	8%	2%	5%	2%	2%	0%	3%	18%	
B3	62	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	2%	0%	37%	23%	2%	0%	3%	3%	0%	8%	19%	
Caa1	83	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	49%	2%	0%	1%	1%	0%	23%	23%	
Caa2	220	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	65%	3%	6%	0%	0%	6%	19%	
Caa3	336	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	5%	1%	2%	3%	19%	
Ca	378	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	80%	2%	0%	3%	15%	
C	361	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	68%	1%	15%	16%	
Total	6,462																									

Other SFPs - 10-Year Transition and Default Rates

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2012 - 12/31/2022 (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	839	21%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	5%
Aa1	77	12%	12%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	13%
Aa2	80	11%	5%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	11%
Aa3	169	7%	1%	1%	0%	12%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	7%
A1	178	1%	0%	1%	2%	15%	7%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	59%	13%
A2	156	0%	0%	0%	5%	0%	1%	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	81%	10%
A3	225	2%	8%	0%	0%	9%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	64%	12%
Baa1	176	0%	3%	3%	1%	1%	1%	2%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	66%	22%
Baa2	127	0%	1%	0%	0%	0%	0%	2%	3%	0%	0%	0%	1%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	73%	19%
Baa3	168	1%	0%	2%	1%	1%	0%	0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	1%	65%	24%
Ba1	138	0%	1%	1%	0%	0%	0%	0%	0%	0%	2%	1%	1%	6%	1%	1%	0%	1%	0%	0%	0%	0%	1%	65%	20%
Ba2	97	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	1%	64%	26%
Ba3	768	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%	1%	8%	0%	50%	36%
B1	219	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	2%	0%	0%	2%	1%	0%	0%	1%	1%	43%	41%
B2	230	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	3%	1%	0%	3%	1%	2%	37%	50%
B3	276	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	4%	3%	1%	1%	1%	5%	33%	50%
Caa1	507	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	11%	3%	2%	2%	14%	23%	41%
Caa2	712	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	8%	8%	4%	3%	14%	22%	39%
Caa3	828	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	18%	16%	2%	6%	23%	33%
Ca	678	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	3%	19%	8%	8%	25%	34%
C	581	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	17%	13%	38%	29%
Total	7,229																								

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

- » 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 - Repackaged Securities
- » Other - Structured Covered Bonds
- » Other - Structured Notes
- » Other - Tax Credit Linked Structured Notes
- » Structured Investment Vehicles - CDO

* Interest-Only (IO) tranches, combination securities (combo notes), and exchangeable certificates are included as other structured finance products, irrespective of their product line.

** 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, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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	4	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	9	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%	0%	86%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A2	7	0%	0%	0%	0%	14%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A3	4	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	5	0%	0%	0%	0%	0%	0%	0%	80%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa2	9	0%	0%	0%	0%	0%	0%	0%	0%	89%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa3	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%
Ba1	5	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba2	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	71%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%
Ba3	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	70%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B1	7	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	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	80%	20%	0%	0%	0%	0%	0%	0%	0%	0%
B3	14	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	71%	7%	0%	0%	7%	14%	0%	0%	0%
Caa1	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	63%	0%	0%	0%	0%	25%	0%	0%	0%
Caa2	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	20%	0%	0%	20%	0%	0%	0%
Caa3	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%
Ca	2	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	-																								
Total	139																								

Sovereign Issuers - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2019 - 12/31/2022 (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%	50%	38%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa3	6	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	6	0%	0%	0%	0%	83%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A2	7	0%	0%	0%	0%	14%	71%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A3	6	0%	0%	0%	0%	0%	17%	33%	17%	17%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa1	5	0%	0%	0%	0%	0%	0%	20%	40%	20%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa2	6	0%	0%	0%	0%	0%	0%	0%	17%	67%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa3	9	0%	0%	0%	0%	0%	0%	0%	0%	33%	22%	0%	11%	0%	11%	0%	0%	0%	0%	0%	0%	0%	11%	0%	11%
Ba1	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	20%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba2	6	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	33%	33%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba3	9	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	56%	11%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B1	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	50%	20%	10%	0%	10%	0%	0%	0%	0%	0%	0%
B2	18	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	50%	22%	11%	0%	0%	0%	11%	0%	0%	0%
B3	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	13%	0%	0%	6%	31%	0%	0%	0%
Caa1	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	40%	0%	0%	0%	40%	0%	0%	0%
Caa2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	17%	0%	50%	0%	0%	0%
Caa3	-																								
Ca	-																								
C	-																								
Total	142																								

Sovereign Issuers - 10-Year Transition and Default Rates

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2012 - 12/31/2022 (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	75%	13%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa1	2	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa2	5	0%	0%	40%	20%	20%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa3	9	0%	0%	11%	44%	33%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A1	4	0%	0%	0%	25%	50%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A2	3	0%	0%	0%	0%	0%	67%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A3	2	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa1	10	0%	0%	0%	0%	0%	10%	0%	10%	10%	10%	0%	20%	0%	10%	10%	0%	0%	0%	0%	0%	0%	10%	0%	10%
Baa2	7	0%	0%	0%	0%	0%	0%	14%	29%	29%	14%	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa3	13	0%	0%	0%	0%	0%	8%	8%	8%	31%	15%	8%	0%	0%	8%	8%	0%	8%	0%	0%	0%	0%	0%	0%	0%
Ba1	7	0%	0%	0%	0%	14%	0%	0%	0%	29%	0%	29%	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%	14%	0%	0%
Ba2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ba3	9	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	11%	11%	11%	11%	22%	0%	0%	0%	0%	0%	22%	0%	0%
B1	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	17%	17%	17%	8%	0%	0%	0%	8%	0%	25%	0%	0%
B2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	17%	33%	17%	0%	0%	0%	0%	0%	17%	0%	0%
B3	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	0%	0%	0%	0%	63%	0%	0%	
Caa1	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	33%	0%	33%	0%	0%
Caa2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caa3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	1	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	119																			0%	0%	0%			

United States Public Finance

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

(December 31, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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	703	99%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Aa1	1,005	4%	94%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Aa2	2,269	0%	2%	94%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%
Aa3	2,306	0%	0%	4%	93%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%
A1	1,992	0%	0%	0%	4%	92%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
A2	1,105	0%	0%	0%	0%	4%	90%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%
A3	621	0%	0%	0%	0%	1%	5%	87%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
Baa1	288	0%	0%	0%	0%	0%	1%	9%	80%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
Baa2	281	0%	0%	0%	0%	0%	0%	2%	10%	80%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
Baa3	267	0%	0%	0%	0%	0%	0%	0%	3%	10%	81%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
Ba1	68	0%	0%	0%	0%	0%	0%	0%	0%	1%	7%	79%	3%	4%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	3%
Ba2	46	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	13%	63%	4%	0%	0%	2%	0%	2%	0%	0%	0%	0%	2%	9%
Ba3	23	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	52%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%
B1	8	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	88%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B2	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%
B3	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	50%
Caa1	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	50%	17%	0%	0%	0%	17%	0%	0%
Caa2	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	67%	0%	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	10,998																								

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

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2019 - 12/31/2022 (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	708	93%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%
Aa1	1,032	6%	79%	8%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	5%
Aa2	2,412	0%	5%	78%	8%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%
Aa3	2,196	0%	0%	7%	75%	8%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	6%
A1	2,012	0%	0%	0%	1%	12%	68%	6%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	8%
A2	1,147	0%	0%	0%	3%	15%	63%	6%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	9%
A3	640	0%	0%	0%	0%	6%	14%	59%	4%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	12%
Baa1	319	0%	0%	0%	1%	2%	5%	16%	51%	9%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	12%
Baa2	266	0%	0%	0%	0%	1%	2%	8%	12%	52%	7%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	13%
Baa3	225	0%	0%	0%	0%	1%	0%	4%	6%	16%	52%	4%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	12%
Ba1	71	0%	0%	0%	0%	0%	0%	3%	0%	8%	13%	44%	7%	4%	3%	3%	3%	0%	0%	0%	0%	0%	0%	0%	13%
Ba2	42	0%	0%	0%	0%	0%	0%	2%	2%	5%	12%	12%	29%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	5%	24%
Ba3	26	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	4%	12%	35%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%
B1	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%
B2	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%
B3	7	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	14%	0%	0%	14%	0%	14%	0%	0%	0%	0%	14%	0%	14%
Caa1	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	25%	25%	0%	0%	0%	0%	0%	25%
Caa2	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	67%	0%	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%	0%	0%	0%	0%	100%
C	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	75%
Total	11,128																								

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

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																				Other Outcomes During 12/31/2012 - 12/31/2022 (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	830	54%	6%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	28%
Aa1	903	15%	47%	12%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	16%
Aa2	3,046	2%	11%	43%	10%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	19%
Aa3	2,621	0%	2%	14%	34%	8%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	25%
A1	3,050	0%	0%	3%	13%	26%	7%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	31%
A2	1,219	0%	0%	1%	6%	16%	23%	6%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	29%
A3	523	0%	0%	1%	2%	7%	14%	20%	5%	3%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	39%
Baa1	335	0%	0%	1%	1%	1%	6%	11%	12%	6%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	44%
Baa2	197	0%	0%	1%	1%	3%	2%	5%	5%	15%	5%	1%	2%	2%	0%	0%	1%	0%	1%	1%	0%	0%	1%	5%	53%
Baa3	145	0%	1%	0%	1%	2%	1%	5%	2%	8%	12%	5%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2%	6%	54%
Ba1	130	0%	0%	1%	2%	3%	1%	2%	1%	4%	5%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	75%
Ba2	27	0%	0%	0%	4%	0%	0%	11%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	78%
Ba3	19	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	11%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	74%
B1	10	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	60%
B2	12	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	8%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%	0%	58%
B3	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Caa1	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	33%	0%	50%
Caa2	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	0%	33%
Caa3	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%
Ca	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	75%
C	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	25%	50%	0%
Total	13,095																								

International Public Finance

International Public Finance - 1-Year Transition and Default Rates

(December 31, 2021 through December 31, 2022)

Credit Ratings as of 12/31/2021		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2021 - 12/31/2022 (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	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	13	0%	85%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa2	20	0%	5%	85%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
Aa3	21	0%	0%	5%	81%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%
A1	27	0%	0%	0%	0%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
A2	11	0%	0%	0%	0%	0%	73%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%
A3	6	0%	0%	0%	0%	0%	0%	83%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%
Baa1	14	0%	0%	0%	0%	0%	0%	0%	50%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%
Baa2	8	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa3	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	56%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	44%
Ba1	25	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	56%
Ba2	15	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	27%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%
Ba3	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	69%
B1	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	94%
B2	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	40%	0%	0%	0%	0%	0%	0%	0%	40%
B3	5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	20%	0%	20%	0%	0%	0%	0%	40%
Caa1	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	25%	0%	0%	0%	0%	50%
Caa2	1	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	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	8	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	248																								

International Public Finance - 3-Year Transition and Default Rates

(December 31, 2019 through December 31, 2022)

Credit Ratings as of 12/31/2019		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2019 - 12/31/2022 (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	88%	6%	6%	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	23	0%	4%	74%	17%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Aa3	20	0%	0%	5%	55%	10%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%
A1	29	0%	0%	0%	0%	79%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%
A2	7	0%	0%	0%	0%	0%	71%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%
A3	8	0%	0%	0%	0%	0%	13%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%
Baa1	14	0%	0%	0%	0%	0%	0%	0%	50%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36%
Baa2	6	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Baa3	19	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	0%	0%	11%	5%	0%	0%	5%	0%	0%	0%	0%	0%	0%	32%
Ba1	25	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	64%
Ba2	18	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	11%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%
Ba3	21	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	10%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	81%
B1	17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	12%	0%	0%	0%	0%	0%	0%	0%	82%
B2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	83%
B3	4	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	25%	0%	0%	0%	0%	0%	0%	50%
Caa1	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	67%	0%	0%	0%	0%	33%
Caa2	11	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	9%	0%	55%	0%	27%
Caa3	2	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%	0%	0%
Ca	-																								
C	-																								
Total	261																								

International Public Finance - 10-Year Transition and Default Rates

(December 31, 2012 through December 31, 2022)

Credit Ratings as of 12/31/2012		Credit Ratings as of 12/31/2022 (Percent)																					Other Outcomes During 12/31/2012 - 12/31/2022 (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	23	61%	13%	4%	9%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%
Aa1	15	7%	47%	27%	7%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
Aa2	14	0%	14%	50%	14%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%
Aa3	16	0%	0%	6%	0%	81%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%
A1	8	0%	0%	13%	13%	0%	50%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%
A2	5	0%	0%	0%	40%	20%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
A3	5	0%	0%	0%	0%	0%	0%	20%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%
Baa1	8	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	75%
Baa2	15	0%	0%	0%	0%	0%	0%	13%	0%	0%	47%	7%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%
Baa3	29	0%	0%	0%	0%	0%	0%	0%	14%	14%	3%	14%	10%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	3%	38%
Ba1	20	0%	0%	0%	0%	0%	0%	0%	0%	5%	5%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	0%	80%
Ba2	23	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	96%
Ba3	28	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	86%
B1	16	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	88%
B2	6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
B3	10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	10%	0%	0%	40%	0%	40%
Caa1	3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%
Caa2	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%
Caa3	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%
Ca	-																								
C	-																								
Total	246																								

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 come due and any estimated financial loss in the event of default or impairment. The contractual financial obligations² 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.³ 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.⁴ Long-term ratings are assigned to issuers or obligations with an original maturity of eleven months or more and reflect both on the likelihood of a default or impairment on contractual financial obligations 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 contractual financial obligations and the expected financial loss suffered in the event of default or impairment.^{5,6} 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.⁷ 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.

² In the case of impairments, there can be a financial loss even when contractual obligations are met.

³ 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.

⁴ 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 equity indexed principal values and cash flows, prepayment penalties, and an obligation to pay an amount that is not ascertainable at the inception of the transaction.

⁵ For certain 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 and financial loss in the event of impairment.

⁶ Debts held on the balance sheets of official sector institutions – which include supranational institutions, central banks and certain government-owned or controlled banks – may not always be treated the same as debts held by private investors and lenders. When it is known that an obligation is held by official sector institutions as well as other investors, a rating (short-term or long-term) assigned to that obligation reflects only the credit risks faced by non-official sector investors.

⁷ 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

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

* 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

P-1	Ratings of Prime-1 reflect a superior ability to repay short-term obligations.
P-2	Ratings of Prime-2 reflect a strong ability to repay short-term obligations.
P-3	Ratings of Prime-3 reflects an acceptable ability to repay short-term obligations.
NP	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.⁸

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

Issuer Ratings

Issuer Ratings are opinions of the ability of entities to honor senior unsecured debt and debt like obligations.^{9,10} 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.

⁸ 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.

⁹ Issuer Ratings as applied to US local government special purpose districts 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. An Issuer Rating as applied to a US state, territory, K-12 public school district, city or county reflects its ability to repay debt and debt-like obligations without consideration of any pledge, security or structural features.

¹⁰ These opinions exclude debt known to be held by official sector investors because in practice such debt could effectively be treated as either senior or junior to senior unsecured debt held by private sector investors.

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 period¹¹), 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;
- 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.¹²

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 (i.e. less than twelve months) 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 reasons 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 after the technical/administrative issue is recognized).

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.

Credit Rating Histories

The credit rating histories required to be disclosed pursuant to 17 CFR 17g-7(b) are located on Moody's website, <https://ratings.moody.com>, at the following URL: <https://ratings.moody.com/sec-17g-7b>.

¹¹ Among some structured finance asset classes, missed scheduled payments impose meaningful investor losses even though such payments are not contractually obligated. Therefore, for structured finance securities, Moody's practice is to recognize that a default has occurred if a material interest payment has been missed (this excludes allowable deferrals not driven by credit stress) for 12 months or longer or if there has been a material principal loss (or writedown) to the security. If such an interest or principal shortfall is subsequently reduced below the materiality threshold of 50 basis points of the original balance of the security, then the default is cured. Note that when a structured finance default is completely cured, we consider retrospectively that no default has taken place.

¹² 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.