

A. Financial Institutions, Brokers, or 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 (%)																					Other Outcomes During 12/31/2021 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	24	100.0%																							
AA+																									
AA	31			96.8%																				3.2%	
AA-	77			1.3%	88.3%	3.9%																		6.5%	
A+	129				2.3%	81.4%	10.9%	1.6%																3.9%	
A	168				0.6%	1.8%	81.0%	8.9%	4.8%															3.0%	
A-	111						6.3%	90.1%	1.8%	0.9%														0.9%	
BBB+	179						0.6%	11.2%	85.5%	2.2%														0.6%	
BBB	146							0.7%	4.1%	78.8%	2.7%											0.7%		13.0%	
BBB-	147								2.7%	4.8%	81.0%		0.7%									0.7%		10.2%	
BB+	99										5.1%	84.8%	1.0%											9.1%	
BB	71										1.4%	2.8%	67.6%	4.2%								1.4%		22.5%	
BB-	106												2.8%	80.2%	0.9%	2.8%						0.9%		12.3%	
B+	91													4.4%	36.3%	12.1%	40.7%							6.6%	
B	72													2.8%	1.4%	40.3%	33.3%			8.3%	2.8%			11.1%	
B-	49														6.1%	2.0%	67.3%	6.1%	2.0%	2.0%				14.3%	
CCC+	7															28.6%	14.3%	42.9%						14.3%	
CCC	12																			66.7%		8.3%		16.7%	
CCC-	1																			100.0%					
CC	4																			25.0%	25.0%	50.0%			
C	1																							100.0%	
TOTAL	1525																								

A. Financial Institutions, Brokers, or 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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	22	95.5%																							4.5%
AA+	2			100.0%																					
AA	17			88.2%	11.8%																				
AA-	79			12.7%	67.1%	16.5%																			3.8%
A+	112			2.7%	8.9%	64.3%	13.4%	0.9%																	9.8%
A	191				0.5%	12.0%	61.8%	16.2%	2.1%		0.5%														6.8%
A-	115						10.4%	60.0%	18.3%	0.9%	0.9%														9.6%
BBB+	169						0.6%	14.8%	63.3%	11.8%	1.2%														8.3%
BBB	172							0.6%	10.5%	44.8%	9.3%	12.8%	0.6%	0.6%									0.6%		20.3%
BBB-	127								2.4%	11.8%	54.3%	9.4%	3.1%										0.8%		18.1%
BB+	86										9.3%	39.5%	10.5%	8.1%		1.2%							1.2%		30.2%
BB	78										6.4%	9.0%	33.3%	21.8%		1.3%							1.3%		26.9%
BB-	86												4.7%	48.8%	8.1%	7.0%	1.2%						7.0%		23.3%
B+	95												2.1%	4.2%	15.8%	11.6%	46.3%								20.0%
B	64													3.1%	3.1%	15.6%	25.0%			9.4%	3.1%		1.6%		39.1%
B-	35													2.9%	5.7%	2.9%	54.3%			2.9%					31.4%
CCC+	5														20.0%	20.0%									60.0%
CCC	6																			50.0%					50.0%
CCC-																									
CC	10																			60.0%	10.0%		10.0%		20.0%
C																									
TOTAL	1471																								

A. Financial Institutions, Brokers, or 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 (%)																				Other Outcomes During 12/31/2012 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	13	84.6%																							15.4%
AA+	2			50.0%																					50.0%
AA	6			33.3%	16.7%	16.7%																			33.3%
AA-	75			10.7%	46.7%	24.0%	2.7%																		16.0%
A+	109			3.7%	9.2%	26.6%	14.7%	7.3%	6.4%			0.9%													31.2%
A	154			3.2%	2.6%	14.3%	27.3%	12.3%	7.8%	0.6%	1.3%	0.6%											0.6%		29.2%
A-	132					4.5%	17.4%	22.7%	13.6%	4.5%	0.8%		1.5%										0.8%		34.1%
BBB+	129						0.8%	13.2%	16.3%	10.9%	1.6%	2.3%	3.1%	7.8%									0.8%		43.4%
BBB	160							3.8%	15.0%	14.4%	7.5%	4.4%	1.3%	5.0%	0.6%		6.9%						0.6%		40.6%
BBB-	132							3.0%	4.5%	9.8%	15.2%	9.1%	0.8%	1.5%	0.8%	0.8%	6.1%								48.5%
BB+	70								1.4%	12.9%	12.9%	17.1%	7.1%	8.6%		2.9%	1.4%						4.3%		31.4%
BB	64									1.6%	7.8%	7.8%	6.3%	3.1%	3.1%	3.1%	3.1%						3.1%		60.9%
BB-	49									4.1%	14.3%	4.1%		10.2%		4.1%	4.1%						12.2%		46.9%
B+	39										5.1%			2.6%	7.7%		12.8%				2.6%		2.6%		66.7%
B	61							1.6%					4.9%	6.6%	4.9%	3.3%	3.3%		1.6%				9.8%		63.9%
B-	45												4.4%	8.9%	4.4%	4.4%	6.7%		6.7%				4.4%		60.0%
CCC+																									
CCC	9																						66.7%		33.3%
CCC-																									
CC	2																								100.0%
C																									
TOTAL	1251																								

B. 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 (%)																					Other Outcomes During 12/31/2021 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA																									
AA+	8		100.0%																						
AA	18			83.3%																				16.7%	
AA-	159				100.0%																				
A+	160				0.6%	91.9%	5.0%																	2.5%	
A	217					18.4%	75.6%	3.2%	0.5%															2.3%	
A-	171						9.4%	80.7%	0.6%	0.6%														8.8%	
BBB+	101							7.9%	89.1%															3.0%	
BBB	50								16.0%	80.0%														4.0%	
BBB-	9									11.1%	77.8%													11.1%	
BB+	8										25.0%	50.0%				12.5%								12.5%	
BB	9												77.8%								11.1%			11.1%	
BB-	7											14.3%		57.1%	14.3%									14.3%	
B+	13													7.7%	53.8%	30.8%								7.7%	
B	9															33.3%	22.2%							44.4%	
B-																									
CCC+																									
CCC	2																50.0%				50.0%				
CCC-																									
CC																									
C																									
TOTAL	941																								

B. 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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA																									
AA+	6		100.0%																						
AA	20			75.0%																				25.0%	
AA-	158				97.5%																			2.5%	
A+	144				2.1%	79.9%	6.9%	2.1%		0.7%														8.3%	
A	246					21.1%	60.2%	3.7%	0.4%															14.6%	
A-	191		1.0%				9.4%	62.8%	9.4%	0.5%														16.8%	
BBB+	128							5.5%	42.2%	3.1%														49.2%	
BBB	48							10.4%	31.3%	37.5%														20.8%	
BBB-	13									23.1%		23.1%		7.7%		15.4%								30.8%	
BB+	10										30.0%	20.0%				10.0%								40.0%	
BB	8											12.5%	50.0%								12.5%			25.0%	
BB-	6												16.7%	33.3%	16.7%									33.3%	
B+	11														27.3%	9.1%								63.6%	
B	13														7.7%	15.4%	15.4%				7.7%			53.8%	
B-	1																							100.0%	
CCC+																									
CCC	2																							100.0%	
CCC-																									
CC																									
C																									
TOTAL	1005																								

B. 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 (%)																				Other Outcomes During 12/31/2012 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	8		12.5%																						87.5%
AA+	6		83.3%																						16.7%
AA	20			70.0%																					30.0%
AA-	154				74.0%	5.2%	0.6%	1.3%																	18.8%
A+	200				11.5%	24.0%	18.0%	2.0%	0.5%																44.0%
A	257				1.2%	21.8%	23.3%	4.7%	0.4%		0.4%														48.2%
A-	211		0.9%			4.7%	10.4%	11.8%	8.5%																63.5%
BBB+	221				0.5%	0.9%	6.8%	16.7%	5.9%	1.4%			0.5%												67.4%
BBB	49						2.0%	12.2%	26.5%	4.1%															55.1%
BBB-	23							8.7%	30.4%	8.7%	4.3%			4.3%											43.5%
BB+	8					12.5%				12.5%		12.5%													62.5%
BB	13						23.1%						15.4%												61.5%
BB-	5								20.0%	20.0%											20.0%				40.0%
B+	4														50.0%										50.0%
B	6															16.7%							16.7%		66.7%
B-	3																								100.0%
CCC+																									
CCC																									
CCC-																									
CC																									
C																									
TOTAL	1188																								

C. 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 (%)																				Other Outcomes During 12/31/2021 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	2	100.0%																							
AA+	3		100.0%																						
AA	6			100.0%																					
AA-	16				100.0%																				
A+	42					92.9%																		7.1%	
A	104					1.0%	97.1%																	1.9%	
A-	158						1.9%	88.0%	5.1%	0.6%														4.4%	
BBB+	258							3.1%	88.0%	4.7%	1.2%													3.1%	
BBB	349								4.9%	81.1%	3.2%	0.6%												10.3%	
BBB-	370								1.1%	11.9%	76.8%	1.9%	0.8%	0.3%										7.3%	
BB+	153									1.3%	16.3%	68.6%	2.6%	2.0%										9.2%	
BB	209										1.0%	9.6%	71.8%	4.8%		0.5%	0.5%							12.0%	
BB-	230											0.4%	6.5%	73.9%	3.9%	3.5%		0.4%	0.4%		0.4%			10.4%	
B+	180													8.9%	58.9%	10.0%	3.3%					0.6%	2.8%	15.6%	
B	315										0.6%				4.8%	64.4%	9.2%	1.3%	0.3%	0.3%			1.3%	17.1%	
B-	402															5.7%	65.2%	4.0%	1.7%	0.7%	0.7%		1.5%	20.4%	
CCC+	97																12.4%	35.1%	8.2%	7.2%	3.1%		8.2%	25.8%	
CCC	61																4.9%	13.1%	39.3%	21.3%	1.6%		6.6%	13.1%	
CCC-	9																		77.8%				11.1%	11.1%	
CC	17																				29.4%		29.4%	41.2%	
C	8																						87.5%	12.5%	
TOTAL	2989																								

C. 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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA																									
AA+	1	100.0%																							
AA	6		33.3%	66.7%																					
AA-	14			7.1%	85.7%																			7.1%	
A+	43				2.3%	79.1%	7.0%																	11.6%	
A	114				0.9%	3.5%	74.6%	8.8%	1.8%	0.9%	0.9%													8.8%	
A-	176						4.5%	59.1%	16.5%	3.4%	1.7%						0.6%							14.2%	
BBB+	257							6.6%	61.1%	13.2%	0.8%	1.2%		0.4%										16.7%	
BBB	326							1.2%	11.0%	54.9%	11.7%	2.1%	0.3%									0.3%		18.4%	
BBB-	314								1.0%	17.8%	51.0%	6.4%	2.5%	1.0%	0.6%							0.3%		19.4%	
BB+	131									6.9%	32.1%	10.7%	5.3%	0.8%										28.2%	
BB	182										4.9%	11.5%	33.5%	11.5%	3.3%	0.5%	1.6%					0.5%		32.4%	
BB-	160										0.6%	2.5%	6.9%	27.5%	4.4%	8.1%	5.6%	1.9%	0.6%		0.6%	0.6%	8.1%	32.5%	
B+	152										1.3%		5.3%	7.2%	21.7%	13.2%	3.9%	1.9%	0.6%			10.5%		36.8%	
B	311												0.6%	1.3%	4.8%	21.9%	12.2%	0.6%	1.0%	0.6%	0.3%	6.8%		49.8%	
B-	373										0.5%	0.3%		0.3%		2.4%	24.4%	4.0%	1.9%	1.9%	0.8%	8.0%		55.5%	
CCC+	73															1.4%	2.7%	1.4%	4.1%			34.2%		47.9%	
CCC	58																3.4%	5.2%	5.2%	3.4%		41.4%		41.4%	
CCC-	17																				11.8%	41.2%		47.1%	
CC	9																				11.1%	55.6%		33.3%	
C	7																					100.0%			
TOTAL	2724																								

C. 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 (%)																					Other Outcomes During 12/31/2012 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	1																								100.0%
AA+	4	25.0%				25.0%																			50.0%
AA	11			18.2%	27.3%																				54.5%
AA-	8			12.5%		12.5%	25.0%	12.5%		12.5%															25.0%
A+	61			1.6%	11.5%	21.3%	18.0%	6.6%	3.3%	3.3%															34.4%
A	128					3.9%	23.4%	16.4%	14.8%	3.1%	0.8%	0.8%											2.3%		34.4%
A-	113					1.8%	5.3%	20.4%	20.4%	7.1%	1.8%	0.9%		0.9%											41.6%
BBB+	220						0.5%	12.3%	29.5%	4.1%			0.9%	0.5%									0.9%		41.4%
BBB	264						0.4%	4.2%	11.4%	21.6%	11.0%	2.7%	0.8%	1.1%									1.5%		45.5%
BBB-	247					0.4%	0.8%		18.6%	15.8%	6.1%	4.9%	1.6%		0.4%	0.4%	0.4%						0.8%		44.9%
BB+	123								1.6%	6.5%	8.9%	7.3%	6.5%	1.6%	0.8%	0.8%							6.5%		59.3%
BB	123								2.4%	4.9%	7.3%	3.3%	5.7%	5.7%	2.4%	1.6%							2.4%		64.2%
BB-	89							1.1%			5.6%	4.5%	7.9%	2.2%	2.2%	1.1%	1.1%						13.5%		60.7%
B+	100									2.0%	6.0%	1.0%	5.0%	1.0%	2.0%								13.0%		70.0%
B	124										0.8%	2.4%	1.6%	4.0%	0.8%		0.8%			0.8%			24.2%		64.5%
B-	62													1.6%	1.6%			1.6%	1.6%				19.4%		74.2%
CCC+																									
CCC	32																						50.0%		50.0%
CCC-																									
CC																									
C	1																						100.0%		
TOTAL	1711																								

D(i) Residential mortgage backed securities ("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 (%)																					Other Outcomes During 12/31/2021 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	6594	89.2%		0.0%			0.2%																	10.6%	0.0%
AA+	209	67.0%	22.5%																					10.5%	
AA	760	40.7%	3.4%	36.6%	0.3%		2.4%			0.1%														12.8%	3.8%
AA-	175	27.4%	8.6%	26.3%	32.0%	1.1%																		4.6%	
A+	329	2.4%	9.4%	10.9%	1.8%	61.7%	0.6%																	13.1%	
A	1605	19.4%	5.2%	14.0%	0.3%	1.4%	41.4%			0.7%			0.4%			0.1%			0.1%					10.7%	6.3%
A-	244		38.5%	6.1%	1.6%	6.1%	16.8%	26.6%																4.1%	
BBB+	158	6.3%	16.5%		0.6%	21.5%	9.5%	21.5%	2.5%	18.4%														3.2%	
BBB	1479	1.0%		7.9%	2.6%	1.1%	30.0%	0.5%	0.5%	35.2%			1.8%			0.1%								6.2%	13.0%
BBB-	288				17.4%	22.9%	11.8%	1.4%	2.4%	15.6%	19.1%													9.4%	
BB+	303				9.6%	15.5%	29.4%	10.9%	1.3%	9.6%	1.0%	18.8%												4.0%	
BB	1307	1.1%		0.3%	0.2%	0.1%	7.8%	4.4%	0.4%	28.5%	0.2%	0.5%	32.4%			1.4%			0.5%		0.1%	0.1%	8.0%	14.2%	
BB-	128					22.7%		0.8%		14.8%	0.8%	4.7%	16.4%	25.0%											
B+	106								28.3%	1.9%		28.3%	15.1%	0.9%	22.6%		2.8%								
B	744						1.2%			12.1%		1.1%	24.7%	0.1%	0.4%	40.5%	1.2%		1.3%		0.3%	0.8%	6.6%	9.7%	
B-	95										2.1%	2.1%	1.1%			37.9%	56.8%								
CCC+																									
CCC	381						0.3%			1.0%			14.2%	0.3%	0.3%	19.2%	0.5%		40.9%		1.6%	0.8%	2.6%	11.0%	7.3%
CCC-																									
CC	361									0.6%			0.8%			19.1%			24.9%		31.0%	2.2%	3.6%	4.2%	13.6%
C	951											0.2%				0.9%			5.9%		17.5%	37.3%	6.0%	4.5%	27.7%
TOTAL	16217																								

D(i) Residential mortgage backed securities ("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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	3773	56.8%					0.1%											0.03%						40.8%	2.3%
AA+	189	68.3%	7.9%				0.5%																	23.3%	
AA	700	36.3%	1.7%	9.4%	0.3%	0.1%	2.7%			0.1%				0.3%					0.1%					36.1%	12.7%
AA-	54	40.7%	14.8%	1.9%	13.0%	1.9%																		27.8%	
A+	272	11.0%	6.3%	3.3%	2.2%	36.0%	6.3%																	34.6%	0.4%
A	1372	16.5%	0.4%	7.9%	0.3%	1.2%	16.1%	0.1%		1.0%				0.5%			0.3%		0.1%					39.2%	16.2%
A-	90	24.4%	1.1%	4.4%	8.9%	16.7%	6.7%	5.6%																32.2%	
BBB+	160	28.8%	1.9%	2.5%		13.1%	8.8%	4.4%	7.5%	0.6%		0.6%												31.3%	0.6%
BBB	1617	9.3%	0.8%	8.3%	0.1%	0.7%	21.8%	0.2%	0.2%	10.3%	0.1%		2.2%			0.9%		0.7%						23.6%	20.8%
BBB-	220	13.2%	45.0%	6.8%		3.2%	3.2%	1.4%	0.9%	0.5%	2.7%		0.5%											22.3%	0.5%
BB+	210	11.0%	35.2%	1.4%	1.0%	3.3%	0.5%	1.4%	1.4%	5.2%	1.0%	5.2%												33.3%	
BB	2099	1.0%	1.2%	2.8%	2.6%	1.9%	11.9%	0.2%	0.3%	18.1%	0.1%	0.2%	10.5%			1.5%		0.8%			0.1%	0.1%	0.1%	20.8%	25.8%
BB-	215	4.7%	3.7%		31.6%	5.6%	10.2%			1.4%	0.5%	2.8%	2.3%			0.9%	0.9%							34.9%	0.5%
B+	162	1.2%				21.6%	34.0%	22.2%	0.6%	0.6%	0.6%	1.2%	1.9%	1.9%	6.2%		3.1%							4.3%	0.6%
B	1122	0.1%		0.7%	2.8%	6.7%	6.2%	5.1%	1.9%	11.6%		0.8%	7.3%	0.2%	0.3%	12.1%	2.1%	2.4%			0.4%	0.3%	2.4%	19.0%	17.7%
B-	12											8.3%				33.3%	41.7%	8.3%						8.3%	
CCC+																									
CCC	726	0.1%		0.1%			2.9%			8.4%		0.7%	9.6%	0.3%	0.1%	7.4%	0.7%		14.5%		2.9%	2.1%	5.9%	19.1%	25.1%
CCC-																									
CC	557						0.4%			2.9%		0.2%	9.2%			9.7%		6.6%			20.1%	5.0%	12.2%	11.7%	22.1%
C	1418									0.1%			0.7%			4.2%		7.8%		10.1%	22.5%	12.6%	8.1%	34.1%	
TOTAL	14968																								

D(i) Residential mortgage backed securities ("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 (%)																				Other Outcomes During 12/31/2012 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	3119	4.1%	0.2%	0.8%	0.1%	0.3%	0.8%	0.03%		0.1%			0.03%				0.1%				0.03%			88.6%	4.8%
AA+	97	7.2%	1.0%	3.1%		1.0%	2.1%			1.0%						2.1%	1.0%							79.4%	2.1%
AA	1502	3.3%	0.4%	1.3%	0.1%	0.3%	1.7%	0.1%		0.9%	0.1%		0.5%			0.1%					0.1%		0.7%	71.3%	19.1%
AA-	195	19.5%	2.6%	0.5%	3.1%	8.2%	1.0%		0.5%								1.5%							63.1%	
A+	94	10.6%	3.2%	2.1%		4.3%	2.1%	1.1%									1.1%							73.4%	2.1%
A	2025	2.6%	0.3%	1.5%	0.3%	1.8%	4.1%	0.05%		1.4%		0.0%	0.5%			0.0%			0.05%		0.05%	0.1%	1.1%	72.5%	13.4%
A-	57	10.5%	3.5%		3.5%	10.5%		5.3%									5.3%							56.1%	5.3%
BBB+	79	3.8%	2.5%	1.3%		8.9%	2.5%	3.8%	1.3%	1.3%														72.2%	2.5%
BBB	1788	1.3%	0.2%	1.2%		1.0%	4.0%	0.3%	0.1%	5.5%		0.2%	2.3%		0.1%	1.1%	0.1%		0.2%			0.1%	2.0%	60.4%	20.1%
BBB-	71	9.9%		1.4%	1.4%	5.6%	5.6%	2.8%	2.8%	2.8%	2.8%	4.2%					2.8%		1.4%					50.7%	5.6%
BB+	32		6.3%			3.1%	12.5%			3.1%			3.1%						3.1%					68.8%	
BB	1422	1.3%	0.4%	1.4%	0.3%	1.2%	3.7%	0.3%	0.1%	5.2%		0.3%	4.4%	0.1%	0.1%	1.3%	0.2%		1.1%		0.1%	0.2%	4.3%	56.3%	17.9%
BB-	23						8.7%			17.4%		4.3%	4.3%	4.3%										56.5%	
B+	16											6.3%			18.8%				6.3%			12.5%		56.3%	
B	2385	1.3%	0.04%	1.6%	0.1%	0.6%	3.7%	0.1%	0.1%	4.9%	0.04%	0.3%	3.1%	0.0%	0.1%	2.2%	0.2%		1.7%		0.5%	0.4%	9.4%	48.0%	21.6%
B-	36							2.8%	2.8%	2.8%							2.8%		2.8%		2.8%			83.3%	
CCC+																									
CCC	2658	3.4%	0.1%	1.4%	0.1%	0.1%	7.0%	0.2%	0.2%	4.3%	0.1%	0.5%	2.9%	0.1%	0.04%	1.5%	0.2%		2.0%		1.0%	2.2%	18.7%	37.8%	16.2%
CCC-																									
CC	2816	3.5%		1.5%			5.9%		0.04%	4.1%		0.04%	2.4%	0.04%		3.0%	0.1%		3.1%		3.7%	2.5%	33.5%	23.1%	13.5%
C	6595	0.2%		0.2%			1.2%	0.03%		2.0%		0.02%	1.5%		0.02%	1.4%	0.02%		1.5%		2.1%	3.4%	66.1%	9.2%	11.4%
TOTAL	25010																								

D(ii) Commercial mortgage backed securities ("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 (%)																				Other Outcomes During 12/31/2021 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	3857	92.6%	0.0%	0.1%			0.1%																	7.2%	
AA+	13	15.4%	76.9%	7.7%																					
AA	116	21.6%	1.7%	56.9%	0.9%		1.7%																	15.5%	1.7%
AA-	651	0.3%		3.5%	93.4%		1.4%	0.2%																1.2%	
A+	16		6.3%			56.3%	12.5%			12.5%														12.5%	
A	153	2.6%	1.3%	7.2%	0.7%	0.7%	68.0%	0.7%		3.9%						1.3%								13.7%	
A-	678			0.3%		0.3%	1.9%	92.8%		2.2%	0.4%													2.1%	
BBB+	81	1.2%		1.2%		1.2%			88.9%			1.2%	1.2%											4.9%	
BBB	275	1.8%		0.7%			3.6%			86.2%	0.4%		3.3%						0.7%					3.3%	
BBB-	760						0.4%	0.3%	0.1%	0.4%	92.6%		2.9%	0.8%		0.1%								2.4%	
BB+	75					1.3%				1.3%		93.3%	1.3%			1.3%								1.3%	
BB	144									3.5%	0.7%		75.7%			6.3%	2.8%		3.5%		0.7%			6.9%	
BB-	363										0.6%		0.3%	89.8%	0.3%	1.9%	4.7%				0.3%			2.2%	
B+	5														100.0%										
B	108												0.9%			77.8%	4.6%		8.3%				2.8%	5.6%	
B-	380												0.3%	0.3%			83.2%		15.0%		0.5%			0.8%	
CCC+	1																	100.0%							
CCC	243															0.4%			76.1%		16.0%	3.3%		4.1%	
CCC-																									
CC	94																				75.5%	17.0%	4.3%	3.2%	
C	140																					74.3%	17.1%	8.6%	
TOTAL	8153																								

D(ii) Commercial mortgage backed securities ("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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)				
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)	
AAA	3198	76.7%	0.0%	0.6%	0.3%	0.1%	0.3%	0.1%		0.1%			0.1%											21.8%		
AA+	11	9.1%	36.4%	9.1%									27.3%											18.2%		
AA	123	13.8%	0.8%	38.2%	9.8%		4.1%			2.4%			2.4%								0.8%			26.0%	1.6%	
AA-	515	1.7%		4.1%	81.4%		5.6%	1.9%		1.0%						0.2%			0.2%					3.9%		
A+	17		5.9%		5.9%	35.3%	29.4%	5.9%																17.6%		
A	152	4.6%	2.0%	7.2%		0.7%	38.2%	0.7%		2.6%			5.3%			2.6%			2.6%			0.7%	1.3%		31.6%	
A-	518	0.8%		0.6%		0.4%	2.3%	79.0%		7.5%	1.4%	0.2%	1.0%			0.2%			0.4%		0.8%				5.6%	
BBB+	74	1.4%		1.4%			1.4%		82.4%				2.7%			1.4%						1.4%			8.1%	
BBB	213	2.3%		0.9%			3.3%			65.3%	0.5%	0.9%	2.3%	0.5%			1.4%		3.8%			1.4%			16.9%	0.5%
BBB-	699			0.1%		0.1%	0.7%	0.3%	0.1%	0.3%	74.4%		5.9%	2.7%		2.4%	2.3%		4.6%		1.0%	0.3%	0.1%		4.6%	
BB+	58											70.7%	5.2%			12.1%	6.9%		1.7%		1.7%				1.7%	
BB	170						0.6%			1.8%	1.2%		35.3%	1.8%		8.8%	4.1%		11.8%		7.6%	7.1%	0.6%		19.4%	
BB-	350					0.3%					0.3%		0.6%	58.0%	0.3%	4.9%	14.9%		12.6%		3.4%		0.3%		4.6%	
B+	4														50.0%				50.0%							
B	147						0.7%			0.7%						24.5%	8.8%		17.7%		10.9%	15.0%	4.8%		17.0%	
B-	307												0.3%			0.3%	50.8%		32.6%		10.7%	2.6%	0.7%		2.0%	
CCC+	1																	100.0%								
CCC	78	1.3%											2.6%						21.8%		15.4%	26.9%	14.1%		17.9%	
CCC-																										
CC	56																		1.8%		25.0%	26.8%	23.2%		21.4%	1.8%
C	113																0.9%					37.2%	55.8%		5.3%	0.9%
TOTAL	6804																									

D(ii) Commercial mortgage backed securities ("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 (%)																				Other Outcomes During 12/31/2012 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	1745	1.4%		0.1%	0.1%	0.1%	0.1%	0.1%		0.1%			0.1%											97.8%	
AA+	29		3.4%																					96.6%	
AA	258	0.8%		5.0%	2.3%		1.6%			1.2%			1.2%								0.4%		0.8%	84.9%	1.9%
AA-	42	2.4%					2.4%			2.4%			2.4%						2.4%					88.1%	
A+	44			2.3%		9.1%	2.3%															2.3%	79.5%	4.5%	
A	358		0.3%	0.8%			2.8%			0.6%			0.8%			0.6%			0.3%		0.3%	0.6%	1.7%	89.9%	1.4%
A-	90						2.2%	2.2%		1.1%	5.6%		1.1%			1.1%			1.1%		1.1%	2.2%	1.1%	81.1%	
BBB+	56								7.1%				3.6%			1.8%	1.8%					3.6%	1.8%	76.8%	3.6%
BBB	324	0.3%								2.8%			0.6%	0.3%					0.9%			0.6%	4.3%	88.3%	1.9%
BBB-	197	0.5%				0.5%				2.5%			2.5%	1.0%		1.0%	0.5%		5.6%		2.5%	1.0%	6.1%	75.6%	0.5%
BB+	43											14.0%										2.3%	7.0%	72.1%	4.7%
BB	347									0.6%	0.6%		2.3%			0.3%			1.4%		2.3%	2.6%	8.6%	79.5%	1.7%
BB-	20													5.0%									5.0%	90.0%	
B+	18														5.6%								11.1%	83.3%	
B	285															3.2%	1.1%		1.4%		2.1%	4.9%	18.2%	65.6%	3.5%
B-	70									1.4%							4.3%				1.4%	5.7%	15.7%	71.4%	
CCC+	1																	100.0%							
CCC	582															0.2%			1.4%		0.5%	3.4%	35.2%	54.8%	4.5%
CCC-																									
CC	413	0.2%					0.2%						0.2%								2.2%	3.1%	68.0%	23.2%	2.7%
C	856						0.1%						0.1%				0.1%		0.1%		2.0%	89.1%	4.3%	4.1%	
TOTAL	5778																								

D(iii) Collateralized loan obligations ("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 (%)																					Other Outcomes During 12/31/2021 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	1367	89.5%																						10.5%	
AA+	102	10.8%	82.4%																					6.9%	
AA	379	1.3%	20.8%	74.4%																				3.4%	
AA-	1		100.0%																						
A+	104		1.0%	1.0%	2.9%	67.3%																		27.9%	
A	226					22.1%	73.9%																	4.0%	
A-	10				10.0%	10.0%		80.0%																	
BBB+	60						3.3%	1.7%	78.3%															16.7%	
BBB	51					2.0%	2.0%	3.9%	52.9%	37.3%														2.0%	
BBB-	158								8.2%	33.5%	51.9%													6.3%	
BB+	55									1.8%	3.6%	87.3%												7.3%	
BB	50											56.0%	42.0%											2.0%	
BB-	145											8.3%	41.4%	46.9%										3.4%	
B+	38													7.9%	81.6%									10.5%	
B	5														40.0%	60.0%									
B-	187												1.1%		16.0%	20.3%	59.9%							2.7%	
CCC+																									
CCC																									
CCC-																									
CC																									
C																									
TOTAL	2938																								

D(iii) Collateralized loan obligations ("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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	1637	41.4%																						58.5%	0.2%
AA+	26	7.7%	7.7%																					84.6%	
AA	400	6.8%	32.5%	12.5%																				48.3%	
AA-	1		100.0%																						
A+	23	4.3%				17.4%																		78.3%	
A	243	0.4%	0.4%	0.4%	0.4%	34.2%	14.8%																	49.4%	
A-	11				18.2%	18.2%																		63.6%	
BBB+	7																							100.0%	
BBB	119					4.2%	2.5%	8.4%	37.0%	5.0%														42.9%	
BBB-	106				0.9%				12.3%	19.8%	4.7%													62.3%	
BB+	5																							100.0%	
BB	145								0.7%		1.4%	45.5%	13.1%	1.4%										37.9%	
BB-	76										10.5%	30.3%	18.4%											40.8%	
B+	4																							100.0%	
B	21														9.5%	9.5%	9.5%							71.4%	
B-	192											1.0%	1.6%	2.6%	31.3%	15.1%	17.7%							30.7%	
CCC+																									
CCC																									
CCC-																									
CC																									
C																									
TOTAL	3016																								

D(iii) Collateralized loan obligations ("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 (%)																				Other Outcomes During 12/31/2012 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	97																							99.0%	1.0%
AA+	2																							100.0%	
AA	35																							100.0%	
AA-	1																							100.0%	
A+	1																							100.0%	
A	36																							94.4%	5.6%
A-	2																							100.0%	
BBB+	3																								33.3%
BBB	41																							95.1%	4.9%
BBB-	6																							100.0%	
BB+	3																							100.0%	
BB	32																							96.9%	3.1%
BB-	7																							100.0%	
B+	3																							100.0%	
B	35															2.9%								94.3%	2.9%
B-	20																						35.0%	60.0%	5.0%
CCC+																									
CCC	13																						15.4%	84.6%	
CCC-																									
CC	7																						57.1%	42.9%	
C	9																						77.8%	11.1%	11.1%
TOTAL	353																								

D(iv) Collateralized debt obligations ("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 (%)																				Other Outcomes During 12/31/2021 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	89	93.3%																						3.4%	3.4%
AA+	7		100.0%																						
AA	44			29.5%																				6.8%	63.6%
AA-	25				96.0%																			4.0%	
A+	30				6.7%	73.3%																		20.0%	
A	84	2.4%		7.1%	1.2%	7.1%	52.4%																	1.2%	28.6%
A-	28			3.6%				78.6%		10.7%														7.1%	
BBB+	13								92.3%															7.7%	
BBB	124	0.8%			0.8%	0.8%	3.2%	2.4%	4.0%	50.8%														11.3%	25.8%
BBB-	21								4.8%	85.7%														4.8%	4.8%
BB+	19									10.5%	78.9%													5.3%	5.3%
BB	53								1.9%	1.9%		3.8%	47.2%											1.9%	43.4%
BB-	5												40.0%	40.0%										20.0%	
B+	6														83.3%										16.7%
B	33											6.1%	3.0%	9.1%	3.0%	54.5%	3.0%								21.2%
B-	4										25.0%						75.0%								
CCC+																									
CCC	67												4.5%		4.5%		3.0%		58.2%						29.9%
CCC-																									
CC	100																		2.0%		73.0%			1.0%	24.0%
C	316																				0.6%	62.0%		0.6%	36.7%
TOTAL	1068																								

D(iv) Collateralized debt obligations ("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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	91	82.4%																						16.5%	1.1%
AA+	6		100.0%																						
AA	45			22.2%	11.1%																			31.1%	35.6%
AA-	27				51.9%			3.7%																22.2%	22.2%
A+	32				9.4%	37.5%	6.3%																	34.4%	12.5%
A	95	1.1%		6.3%	1.1%	7.4%	36.8%		1.1%															13.7%	32.6%
A-	26					7.7%	65.4%			7.7%															19.2%
BBB+	32				3.1%	6.3%		3.1%	21.9%	28.1%	3.1%													31.3%	3.1%
BBB	130	0.8%		1.5%	0.8%	0.8%	2.3%	2.3%	1.5%	33.8%	7.7%													24.6%	23.8%
BBB-	16								6.3%	12.5%	25.0%													12.5%	43.8%
BB+	13			7.7%			7.7%			15.4%	53.8%													15.4%	
BB	56	1.8%					1.8%		3.6%	3.6%	1.8%	3.6%	39.3%											8.9%	35.7%
BB-	8													25.0%	12.5%									62.5%	
B+	4														75.0%									25.0%	
B	41											9.8%	9.8%			41.5%	2.4%							2.4%	34.1%
B-	2																							100.0%	
CCC+																									
CCC	84											3.6%	4.8%	3.6%	6.0%	1.2%	4.8%		46.4%					2.4%	27.4%
CCC-																									
CC	107																				68.2%			6.5%	25.2%
C	426																		0.5%		0.5%	46.0%	12.7%	2.3%	38.0%
TOTAL	1241																								

D(iv) Collateralized debt obligations ("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 (%)																				Other Outcomes During 12/31/2012 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	144	41.7%											2.8%											50.0%	5.6%
AA+	8		62.5%																					37.5%	
AA	40			15.0%																				85.0%	
AA-	57				10.5%																			87.7%	1.8%
A+	28					25.0%																		71.4%	3.6%
A	158						21.5%																	67.7%	10.8%
A-	26							57.7%																34.6%	7.7%
BBB+	26								15.4%	7.7%														73.1%	3.8%
BBB	210	1.0%		3.3%		0.5%				24.3%	1.0%	1.0%												58.6%	10.5%
BBB-	29								3.4%	3.4%	13.8%	6.9%												65.5%	6.9%
BB+	21											9.5%												85.7%	4.8%
BB	163	0.6%		0.6%	0.6%	0.6%							10.4%										1.2%	65.6%	20.2%
BB-	6																							83.3%	16.7%
B+	9																							88.9%	11.1%
B	171			1.2%		0.6%	1.2%		0.6%	0.6%						9.9%							2.9%	65.5%	17.5%
B-	14	7.1%																					14.3%	71.4%	7.1%
CCC+																									
CCC	221				0.5%	1.4%	0.5%	0.5%	0.5%	0.5%	0.5%	1.8%				0.5%			13.1%				6.3%	62.9%	10.9%
CCC-																									
CC	284			0.7%			0.4%	0.4%	0.7%			1.8%	0.4%	1.1%	0.7%		0.7%		1.8%		20.8%	2.5%	13.7%	34.2%	20.4%
C	1334												0.2%		0.2%				0.5%		1.2%	14.2%	23.4%	7.3%	53.0%
TOTAL	2949																								

D(v) Asset-backed commercial paper ("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 (%)						Other Outcomes During 12/31/2021 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	F1+	F1	F2	F3	B	C	Defaults	Paid Off	Withdrawn (other)
F1+	8	100.0%								
F1	37	10.8%	81.1%						2.7%	5.4%
F2	1									100.0%
F3										
B										
C										
TOTAL	46									

D(v) Asset-backed commercial paper ("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 (%)						Other Outcomes During 12/31/2019 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	F1+	F1	F2	F3	B	C	Defaults	Paid Off	Withdrawn (other)
F1+	11	72.7%	9.1%						18.2%	
F1	31	6.5%	87.1%						6.5%	
F2	1									100.0%
F3										
B										
C										
TOTAL	43									

D(v) Asset-backed commercial paper ("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 (%)						Other Outcomes During 12/31/2012 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	F1+	F1	F2	F3	B	C	Defaults	Paid Off	Withdrawn (other)
F1+	13	30.8%	15.4%						30.8%	23.1%
F1	40	7.5%	47.5%						35.0%	10.0%
F2	2								100.0%	
F3										
B										
C										
TOTAL	55									

D(vi) Other asset-backed securities ("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 (%)																				Other Outcomes During 12/31/2021 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	1485	76.3%		0.1%						0.1%														23.4%	0.1%
AA+	30	26.7%	46.7%																					26.7%	
AA	361	22.2%	2.2%	57.1%			0.3%																	18.3%	
AA-	19	5.3%	10.5%	5.3%	73.7%																			5.3%	
A+	96		3.1%	10.4%	2.1%	67.7%																		15.6%	1.0%
A	558	1.8%	0.4%	10.0%		0.9%	72.4%		0.2%	0.2%	0.2%												0.2%	13.8%	
A-	62		1.6%	4.8%	1.6%	3.2%	6.5%	58.1%		1.6%			1.6%											21.0%	
BBB+	54	1.9%		5.6%		5.6%	5.6%	11.1%	57.4%										1.9%					11.1%	
BBB	270			0.7%		1.1%	8.9%	0.7%	1.5%	71.1%	0.4%	0.4%	1.9%		1.9%	0.4%		0.7%						10.4%	
BBB-	48					2.1%	6.3%			2.1%	62.5%		4.2%											18.8%	4.2%
BB+	112								1.8%	0.9%	4.5%	78.6%												14.3%	
BB	110								1.8%	8.2%	0.9%	2.7%	66.4%			4.5%	0.9%	1.8%		0.9%				10.9%	0.9%
BB-	21												9.5%	71.4%			4.8%							14.3%	
B+	13											7.7%			69.2%										23.1%
B	80						1.3%						3.8%	1.3%	1.3%	66.3%			5.0%		15.0%			6.3%	
B-	5																80.0%		20.0%						
CCC+																									
CCC	32														3.1%	3.1%			59.4%		18.8%			15.6%	
CCC-																									

D(vi) Other asset-backed securities ("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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	1705	37.5%		0.5%		0.1%	0.1%			0.1%			0.1%			0.1%								61.1%	0.5%
AA+	49	18.4%	8.2%			2.0%																		71.4%	
AA	436	10.1%	0.2%	26.4%	0.7%					0.2%			0.2%											61.7%	0.5%
AA-	17	17.6%	5.9%	11.8%	35.3%																			29.4%	
A+	114	7.9%	0.9%	2.6%		34.2%	1.8%									0.9%								47.4%	4.4%
A	633	2.5%		2.7%	0.2%	0.6%	43.3%	0.5%	0.2%	1.4%	0.3%		0.6%				0.2%		0.3%			0.2%	46.8%	0.3%	
A-	47	2.1%		2.1%			6.4%	40.4%	6.4%									4.3%						38.3%	
BBB+	64	4.7%	1.6%	4.7%	1.6%	3.1%	1.6%	1.6%	15.6%										1.6%					43.8%	20.3%
BBB	294	0.7%	0.3%	5.1%		0.3%	3.4%	0.3%	0.7%	33.0%	0.7%	0.3%	2.0%			3.1%	0.3%		0.3%		1.0%			46.3%	2.0%
BBB-	39		2.6%			2.6%	7.7%	2.6%			7.7%	2.6%												69.2%	5.1%
BB+	132			0.8%				1.5%			0.8%	45.5%												51.5%	
BB	105	1.0%				1.0%			1.0%	3.8%	1.0%	1.0%	26.7%			2.9%		10.5%			2.9%			44.8%	3.8%
BB-	18						5.6%			5.6%				50.0%			5.6%							33.3%	
B+	6											16.7%			16.7%									16.7%	50.0%
B	91														2.2%	45.1%					14.3%	6.6%	27.5%	4.4%	
B-	2																100.0%								
CCC+																									
CCC	23						4.3%								4.3%	4.3%			52.2%		8.7%	4.3%	4.3%	13.0%	4.3%
CCC-																									
CC	26																				88.5%				11.5%
C	39																					97.4%	2.6%		
TOTAL	3840																								

D(vi) Other asset-backed securities ("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 (%)																					Other Outcomes During 12/31/2012 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	1848	12.7%		1.2%		0.1%	0.1%			0.1%						1.2%	0.1%		0.1%		0.4%		0.2%	82.5%	1.4%
AA+	13									7.7%											7.7%		7.7%	76.9%	
AA	200	0.5%		3.5%		0.5%	1.0%		0.5%	0.5%														91.0%	2.5%
AA-	64	1.6%			7.8%	1.6%	3.1%	1.6%											1.6%					81.3%	1.6%
A+	142	4.2%		2.8%			2.8%			0.7%						2.1%						0.7%		85.9%	0.7%
A	553	1.8%		0.5%		0.4%	3.8%	0.4%	0.2%			0.7%				0.9%					0.7%	0.2%		90.1%	0.4%
A-	51	2.0%		2.0%		2.0%	15.7%	15.7%			2.0%	3.9%											2.0%	52.9%	2.0%
BBB+	159										0.6%		1.9%											60.4%	37.1%
BBB	281	1.1%		1.1%		0.4%	5.3%	0.4%	0.4%	4.6%			1.1%	0.4%		0.7%			2.1%				1.8%	71.2%	9.6%
BBB-	92			1.1%			7.6%			3.3%						1.1%	1.1%						2.2%	78.3%	5.4%
BB+	23																							43.5%	56.5%
BB	113						11.5%			5.3%			1.8%		0.9%	3.5%				0.9%				61.9%	14.2%
BB-	21													4.8%									9.5%	9.5%	76.2%
B+	26			3.8%																					96.2%
B	78															2.6%			1.3%		7.7%			42.3%	46.2%
B-	6																				16.7%			16.7%	66.7%
CCC+																									
CCC	32																		9.4%		9.4%	3.1%		59.4%	18.8%
CCC-																									
CC	33						3.0%														36.4%	15.2%	3.0%	24.2%	18.2%
C	66																					48.5%	3.0%	6.1%	42.4%
TOTAL	3801																								

D(vii) Other Structured Finance Products ("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 (%)																				Other Outcomes During 12/31/2021 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	77	97.4%																						2.6%	
AA+	4		100.0%																						
AA	149			92.6%																			6.7%	0.7%	
AA-	1			100.0%																					
A+	8				25.0%	62.5%																		12.5%	
A	95					1.1%	91.6%																7.4%		
A-	5					60.0%	20.0%		20.0%																
BBB+	2								50.0%															50.0%	
BBB	1									100.0%															
BBB-	2										100.0%														
BB+	1											100.0%													
BB																									
BB-																									
B+																									
B																									
B-																									
CCC+																									
CCC																									
CCC-																									
CC																									
C																									
TOTAL	345																								

D(vii) Other Structured Finance Products ("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 (%)																				Other Outcomes During 12/31/2019 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	365	18.4%		31.0%			13.7%																	15.9%	21.1%
AA+	4	25.0%	50.0%																						25.0%
AA	89			15.7%			16.9%			1.1%														16.9%	49.4%
AA-	2			50.0%																					50.0%
A+	5				40.0%																				60.0%
A	43					9.3%	41.9%																	9.3%	39.5%
A-	7					42.9%	14.3%		14.3%																28.6%
BBB+	4								25.0%																75.0%
BBB	2										50.0%														50.0%
BBB-	1																								100.0%
BB+																									
BB																									
BB-																									
B+																									
B																									
B-																									
CCC+																									
CCC																									
CCC-																									
CC																									
C																									
TOTAL	522																								

*D(vii) Other Structured Finance Products ("other SFPs") Data includes structured finance other long term ratings not otherwise classified including covered bond programs and closed end fund ratings.

D(vii) Other Structured Finance Products ("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 (%)																					Other Outcomes During 12/31/2012 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	384	9.4%		9.6%			8.3%																	54.2%	18.5%
AA+	6	50.0%																							50.0%
AA	32			12.5%																				46.9%	40.6%
AA-	8			12.5%																					87.5%
A+	2				50.0%																				50.0%
A	36			2.8%			44.4%		2.8%															11.1%	38.9%
A-	4			25.0%																					75.0%
BBB+	4																								100.0%
BBB	44				2.3%	15.9%	2.3%																50.0%	29.5%	
BBB-	3			33.3%					33.3%																33.3%
BB+																									
BB	2						50.0%																		50.0%
BB-	2																								100.0%
B+																									
B																									
B-	1																								100.0%
CCC+	4																								100.0%
CCC																									
CCC-																									
CC																									
C																									
TOTAL	532																								

E(i) 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 (%)																				Other Outcomes During 12/31/2021-12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	26	100.0%																							
AA+	8		87.5%	12.5%																					
AA	9		22.2%	66.7%	11.1%																				
AA-	9				100.0%																				
A+	7				28.6%	71.4%																			
A	7						100.0%																		
A-	7							71.4%																28.6%	
BBB+	5							20.0%	60.0%															20.0%	
BBB	14								14.3%	71.4%														14.3%	
BBB-	7									14.3%	85.7%														
BB+	9											77.8%	11.1%											11.1%	
BB	6												83.3%	16.7%											
BB-	12												8.3%	75.0%	8.3%	8.3%									
B+	10													10.0%	80.0%	10.0%									
B	10															60.0%	10.0%					10.0%	20.0%		
B-	9																66.7%	22.2%			11.1%				
CCC+																									
CCC	6																16.7%	33.3%		33.3%				16.7%	
CCC-																									
CC	1																								
C																							100.0%		
TOTAL	162																								

E(i) 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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	27	96.3%	3.7%																						
AA+	5		80.0%	20.0%																					
AA	9		22.2%	33.3%	44.4%																				
AA-	9			11.1%	66.7%	22.2%																			
A+	6				16.7%	50.0%	16.7%																	16.7%	
A	6						83.3%	16.7%																	
A-	5						20.0%	60.0%	20.0%																
BBB+	7							14.3%	28.6%	28.6%														28.6%	
BBB	14								7.1%	57.1%	14.3%	7.1%												14.3%	
BBB-	11								9.1%	9.1%	36.4%	9.1%	27.3%											9.1%	
BB+	9											55.6%	11.1%	11.1%	11.1%									11.1%	
BB	5												40.0%	60.0%											
BB-	10												10.0%	60.0%	20.0%	10.0%									
B+	12													8.3%	33.3%	33.3%	16.7%	8.3%							
B	12														8.3%	25.0%	25.0%		8.3%			8.3%	25.0%		
B-	6																33.3%	16.7%			16.7%		33.3%		
CCC+																									
CCC	3																	66.7%					33.3%		
CCC-																									
CC	2																								
C																							100.0%		
TOTAL	158																								

E(i) 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 (%)																				Other Outcomes During 12/31/2012 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	28	78.6%	10.7%	3.6%	7.1%																				
AA+	2		50.0%		50.0%																				
AA	5		20.0%	20.0%	40.0%																			20.0%	
AA-	5			20.0%	60.0%		20.0%																		
A+	9			11.1%	22.2%	33.3%	22.2%	11.1%																	
A	4					25.0%	25.0%						25.0%											25.0%	
A-	4						25.0%	25.0%	25.0%	25.0%															
BBB+	4				25.0%					25.0%			25.0%	25.0%											
BBB	14						7.1%	14.3%	14.3%	7.1%	14.3%		7.1%	7.1%	7.1%									21.4%	
BBB-	12						8.3%		8.3%	25.0%	16.7%	25.0%		8.3%		8.3%									
BB+	8								12.5%	25.0%	12.5%	12.5%		12.5%			12.5%								
BB	1																						100.0%		
BB-	14										7.1%	21.4%	7.1%	7.1%	7.1%	14.3%	21.4%						14.3%		
B+	8												12.5%		12.5%	25.0%	12.5%					12.5%	25.0%		
B	9													22.2%	22.2%	11.1%							33.3%	11.1%	
B-	2																						100.0%		
CCC+																									
CCC	1												100.0%												
CCC-																									
CC	1																								
C																							100.0%		
TOTAL	131																								

E(ii) U.S. 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 (%)																				Other Outcomes During 12/31/2021 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	478	97.3%	0.2%																						2.5%
AA+	560	2.1%	93.2%	0.7%																					3.9%
AA	669	0.1%	4.0%	90.9%	0.9%																				4.0%
AA-	598		0.2%	3.0%	91.8%	0.8%	0.2%																		4.0%
A+	356				3.9%	91.6%	0.3%																		4.2%
A	285					9.1%	82.5%	1.4%																	7.0%
A-	210						11.0%	83.8%	1.4%			0.5%													3.3%
BBB+	146						2.1%	13.0%	78.1%	2.7%															4.1%
BBB	178							0.6%	5.1%	89.3%	2.8%														2.2%
BBB-	187								1.6%	10.7%	77.0%	2.7%	1.1%	1.1%											5.9%
BB+	91									3.3%	4.4%	75.8%	1.1%	2.2%											13.2%
BB	59					1.7%						3.4%	76.3%	3.4%		3.4%									11.9%
BB-	37											2.7%		83.8%	2.7%	5.4%									5.4%
B+	14													7.1%	42.9%			7.1%							42.9%
B	10															60.0%						10.0%			30.0%
B-	16																81.3%					6.3%			12.5%
CCC+																									
CCC	13																		38.5%		15.4%	7.7%			38.5%
CCC-																									
CC	6																				16.7%	16.7%	33.3%		33.3%
C	4																					100.0%			
TOTAL	3917																								

E(ii) U.S. 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 (%)																				Other Outcomes During 12/31/2019 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	491	87.2%	2.9%	0.6%	0.4%	0.2%																			8.8%
AA+	562	5.2%	81.1%	3.6%	0.4%	0.2%	0.4%																		9.3%
AA	657	0.9%	7.9%	74.4%	5.5%	0.3%		0.3%																	10.7%
AA-	582	0.2%	0.3%	8.2%	72.5%	3.6%	0.9%	0.7%	0.2%																13.4%
A+	388			0.8%	11.9%	65.7%	4.6%	0.5%	0.5%														0.8%		15.2%
A	300			0.3%	1.0%	15.3%	62.3%	5.3%	0.7%		0.7%														14.3%
A-	200					0.5%	14.5%	63.5%	3.5%	2.5%		0.5%													15.0%
BBB+	143			0.7%	0.7%		0.7%		11.2%	52.4%	13.3%	4.2%	0.7%												16.1%
BBB	181							2.8%	10.5%	54.7%	9.9%	4.4%	1.1%					0.6%				0.6%			15.5%
BBB-	157							0.6%	0.6%	19.7%	49.7%	11.5%	4.5%	1.9%		1.3%									10.2%
BB+	60									1.7%	8.3%	46.7%	8.3%	6.7%	1.7%										26.7%
BB	48						2.1%		2.1%		4.2%	10.4%	47.9%	14.6%		2.1%									16.7%
BB-	21											4.8%		33.3%	4.8%	9.5%	9.5%						9.5%		28.6%
B+	14														28.6%	7.1%	28.6%		7.1%						28.6%
B	10															20.0%	20.0%						20.0%		40.0%
B-	15																20.0%		6.7%					13.3%	60.0%
CCC+																									
CCC	9																		22.2%			22.2%	11.1%	11.1%	33.3%
CCC-																									
CC	6																		16.7%		16.7%		16.7%		50.0%
C	9												44.4%									44.4%			11.1%
TOTAL	3853																								

E(ii) U.S. 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 (%)																				Other Outcomes During 12/31/2012 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	478	50.2%	5.4%	0.6%	1.7%																				42.1%
AA+	479	13.4%	47.0%	7.3%	1.7%	0.4%	0.6%																		29.6%
AA	634	3.0%	17.4%	32.5%	6.8%	2.1%	1.3%	0.6%																	36.4%
AA-	742	1.2%	5.1%	16.0%	24.8%	6.5%	1.9%	0.8%	0.5%	0.4%								0.1%					0.1%		42.5%
A+	481	0.6%	1.5%	6.9%	14.3%	21.0%	4.6%	4.4%	1.2%	0.4%	0.2%											0.2%			44.5%
A	327	0.9%	0.9%	2.4%	8.0%	13.1%	18.7%	4.9%	0.9%	0.9%	1.2%	0.9%											0.3%		46.8%
A-	311		0.3%	1.9%	3.2%	5.5%	10.3%	10.3%	3.9%	2.6%	0.3%	1.0%	0.3%												60.5%
BBB+	170		0.6%		5.9%	2.4%	11.8%	9.4%	8.2%	5.9%	1.2%	1.8%	0.6%		0.6%								2.4%		49.4%
BBB	131				0.8%	0.8%	4.6%	5.3%	6.9%	14.5%	4.6%	1.5%	0.8%		0.8%				1.5%						58.0%
BBB-	141					1.4%	1.4%	3.5%	3.5%	11.3%	12.8%	7.1%	5.7%	2.1%			0.7%						2.1%		48.2%
BB+	52				1.9%			1.9%		3.8%	9.6%	9.6%	3.8%	3.8%			1.9%						3.8%		59.6%
BB	38								5.3%	5.3%	5.3%	5.3%		2.6%	2.6%							2.6%	5.3%		60.5%
BB-	16										6.3%		6.3%									6.3%			81.3%
B+	12														8.3%		25.0%						8.3%		58.3%
B	13					7.7%										7.7%	7.7%		7.7%				7.7%		61.5%
B-	8														12.5%		12.5%		12.5%				12.5%		50.0%
CCC+																									
CCC	15																					6.7%		53.3%	40.0%
CCC-																									
CC	5																							80.0%	20.0%
C	5																						20.0%		60.0%
TOTAL	4058																								

E(iii) 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 (%)																				Other Outcomes During 12/31/2021 - 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	28	92.9%																						7.1%	
AA+	6		100.0%																						
AA	34		5.9%	91.2%	2.9%																				
AA-	47				100.0%																				
A+	67				3.0%	95.5%																		1.5%	
A	55				1.8%	1.8%	90.9%	1.8%																3.6%	
A-	64						1.6%	85.9%	4.7%															7.8%	
BBB+	58							3.4%	86.2%	5.2%														5.2%	
BBB	116								4.3%	76.7%	1.7%													17.2%	
BBB-	68										83.8%	1.5%	1.5%											13.2%	
BB+	33										3.0%	60.6%	6.1%											30.3%	
BB	24												54.2%											45.8%	
BB-	26													50.0%		34.6%								15.4%	
B+	8														75.0%	12.5%									
B	16														6.3%	12.5%	12.5%				50.0%	6.3%		12.5%	
B-	4																50.0%	25.0%			25.0%				
CCC+																									
CCC	1																	100.0%							
CCC-	2																			100.0%					
CC	5																			60.0%	40.0%				
C																									
TOTAL	662																								

E(iii) 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 (%)																				Other Outcomes During 12/31/2019 12/31/2022 (%)			
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	25	84.0%	8.0%																						8.0%
AA+	1		100.0%																						
AA	38	2.6%	13.2%	65.8%	13.2%																				5.3%
AA-	22			4.5%	77.3%	13.6%																			4.5%
A+	32				12.5%	78.1%	3.1%																		6.3%
A	47				2.1%	17.0%	61.7%	12.8%	2.1%																4.3%
A-	61					1.6%	8.2%	62.3%	8.2%																19.7%
BBB+	45					2.2%		6.7%	57.8%	17.8%															15.6%
BBB	94								6.4%	50.0%	5.3%	4.3%	3.2%												30.9%
BBB-	54								1.9%	16.7%	53.7%	3.7%	1.9%												22.2%
BB+	37										13.5%	21.6%	13.5%												51.4%
BB	23										8.7%	4.3%	26.1%	8.7%											52.2%
BB-	28													35.7%	7.1%	17.9%									39.3%
B+	11										9.1%	27.3%		9.1%	27.3%	9.1%	9.1%								45.5%
B	10													10.0%		10.0%	10.0%				40.0%	10.0%			20.0%
B-																									
CCC+																									
CCC	9																22.2%						77.8%		
CCC-																									
CC	1																						100.0%		
C																									
TOTAL	538																								

E(iii) 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 (%)																					Other Outcomes During 12/31/2012 - 12/31/2022 (%)		
Credit Rating	# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)
AAA	37	51.4%	2.7%	24.3%	5.4%																			16.2%	
AA+	6		16.7%	16.7%	33.3%	33.3%																			
AA	18		22.2%	22.2%	22.2%	5.6%																		27.8%	
AA-	17			11.8%	29.4%	5.9%		23.5%																29.4%	
A+	7				14.3%	28.6%	14.3%	28.6%																14.3%	
A	5				20.0%				40.0%															40.0%	
A-	30				10.0%			6.7%	3.3%	23.3%	6.7%													50.0%	
BBB+	14						7.1%	28.6%	7.1%	7.1%														50.0%	
BBB	29						3.4%	10.3%	3.4%	17.2%	13.8%		3.4%	3.4%	3.4%									41.4%	
BBB-	30								3.3%	6.7%	30.0%	10.0%		6.7%		3.3%								40.0%	
BB+	19								5.3%	5.3%	5.3%		5.3%			5.3%								73.7%	
BB	13																							100.0%	
BB-	11													9.1%		9.1%	9.1%							72.7%	
B+	10																							100.0%	
B	2																					50.0%		50.0%	
B-	5																20.0%					60.0%		20.0%	
CCC+																									
CCC																									
CCC-																									
CC																									
C																									
TOTAL	253																								

Fitch calculates the "Default" classification to incorporate its definitions of both "D – Default" and "Restricted Default," where both such definitions were applicable to a particular asset class. For the purposes of these performance and measurement statistics, a credit rating is classified as a Default if any of the following conditions are met:

- The obligor failed to timely pay principal or interest due according to the terms of an obligation during the applicable period or the issuer of the security or money market instrument failed to timely pay principal or interest due according to the terms of the security or money market instrument during the applicable period;
- The security or money market instrument was subject to a write-down, applied loss, or other realized deficiency of the outstanding principal amount during the applicable period.

Definitions and Symbols

International Credit Rating Scales

The Credit Rating Scales (those featuring the symbols 'AAA'–'D' and 'F1'–'D') are used for debt and financial strength ratings. This page describes their use for issuers and obligations in corporate, public, structured and infrastructure and project finance debt markets.

Within rating categories, Fitch may use modifiers. The modifiers "+" or "–" may be appended to a rating to denote relative status within major rating categories.

For example, the rating category 'AA' has three notch-specific rating levels ('AA+', 'AA', 'AA–'; each a rating level). Such suffixes are not added to 'AAA' ratings and ratings below the 'CCC' category. For the short-term rating category of 'F1', a '+' may be appended. For Viability Ratings, the modifiers "+" or "–" may be appended to a rating to denote relative status within categories from 'aa' to 'ccc'. For Derivative Counterparty Ratings the modifiers "+" or "–" may be appended to the ratings within 'AA(dcr)' to 'CCC(dcr)' categories.

International credit ratings relate to either foreign currency or local currency commitments and, in both cases, assess the capacity to meet these commitments using a globally applicable scale. As such, both foreign currency and local currency international ratings are internationally comparable assessments.

The Local Currency International Rating measures the likelihood of repayment in the currency of the jurisdiction in which the issuer is domiciled and hence does not take account of the risk that it will not be possible to convert local currency into foreign currency or make transfers between sovereign jurisdictions (transfer and convertibility [T&C] risk).

A Local Currency International Rating will be assigned in cases where an issuance's original terms and conditions allow for repayment of foreign currency investors in local currency equivalent at the prevailing exchange rate at the time of repayment.

Foreign Currency Ratings additionally consider the profile of the issuer or note after addressing T&C risk. This risk is usually communicated for different countries by the Country Ceiling, which caps the foreign currency ratings of most, though not all, issuers within a given country.

Besides T&C risks, there can be rating distinctions between an issuer's Local Currency and Foreign Currency Ratings, when there is considered to be a risk of selective default on Local Currency obligations versus Foreign Currency obligations, or vice versa.

A Foreign Currency Rating will be assigned in cases where an issuance is denominated in local currency or local currency equivalent, but repayment of principal and/or interest is required to be made in foreign currency at the prevailing exchange rate at the time of repayment.

Where the rating is not explicitly described in the relevant RAC as local or foreign currency, the reader should assume that the rating is a Foreign Currency Rating (i.e. the rating is applicable for all convertible currencies of obligation).

Issuer Default Ratings

Rated entities in a number of sectors, including financial and non-financial corporations, sovereigns, insurance companies and certain sectors within public finance, are generally assigned IDRs. IDRs are also assigned to certain entities or enterprises in global infrastructure, project finance and public finance. IDRs opine on an entity's relative vulnerability to default (including by way of a distressed debt exchange)

on financial obligations. The threshold default risk addressed by the IDR is generally that of the financial obligations whose non-payment would best reflect the uncured failure of that entity. As such, IDRs also address relative vulnerability to bankruptcy, administrative receivership or similar concepts.

In aggregate, IDRs provide an ordinal ranking of issuers based on the agency's view of their relative vulnerability to default, rather than a prediction of a specific percentage likelihood of default.

AAA: Highest Credit Quality

'AAA' ratings denote the lowest expectation of default risk. They are assigned only in cases of exceptionally strong capacity for payment of financial commitments. This capacity is highly unlikely to be adversely affected by foreseeable events.

AA: Very High Credit Quality

'AA' ratings denote expectations of very low default risk. They indicate very strong capacity for payment of financial commitments. This capacity is not significantly vulnerable to foreseeable events.

A: High Credit Quality

'A' ratings denote expectations of low default risk. The capacity for payment of financial commitments is considered strong. This capacity may, nevertheless, be more vulnerable to adverse business or economic conditions than is the case for higher ratings.

BBB: Good Credit Quality

'BBB' ratings indicate that expectations of default risk are currently low. The capacity for payment of financial commitments is considered adequate, but adverse business or economic conditions are more likely to impair this capacity.

BB: Speculative

'BB' ratings indicate an elevated vulnerability to default risk, particularly in the event of adverse changes in business or economic conditions over time; however, business or financial flexibility exists that supports the servicing of financial commitments.

B: Highly Speculative

'B' ratings indicate that material default risk is present, but a limited margin of safety remains. Financial commitments are currently being met; however, capacity for continued payment is vulnerable to deterioration in the business and economic environment.

CCC: Substantial Credit Risk

Very low margin for safety. Default is a real possibility.

CC: Very High Levels of Credit Risk

Default of some kind appears probable.

C: Near Default

A default or default-like process has begun, or the issuer is in standstill, or for a closed funding vehicle, payment capacity is irrevocably impaired. Conditions that are indicative of a 'C' category rating for an issuer include:

- The issuer has entered into a grace or cure period following non-payment of a material financial obligation;
- The issuer has entered into a temporary negotiated waiver or standstill agreement following a payment default on a material financial obligation;
- The formal announcement by the issuer or their agent of a distressed debt exchange;

- A closed financing vehicle where payment capacity is irrevocably impaired such that it is not expected to pay interest and/or principal in full during the life of the transaction, but where no payment default is imminent

RD: Restricted Default

'RD' ratings indicate an issuer that in Fitch's opinion has experienced:

- An uncured payment default or distressed debt exchange on a bond, loan or other material financial obligation, but
- Has not entered into bankruptcy filings, administration, receivership, liquidation, or other formal winding-up procedure, and
- Has not otherwise ceased operating. This would include:
 - The selective payment default on a specific class or currency of debt;
 - The uncured expiry of any applicable grace period, cure period or default forbearance period following a payment default on a bank loan, capital markets security or other material financial obligation;
 - The extension of multiple waivers or forbearance periods upon a payment default on one or more material financial obligations, either in series or in parallel; ordinary execution of a distressed debt exchange on one or more material financial obligations.

D: Default

'D' ratings indicate an issuer that in Fitch's opinion has entered into bankruptcy filings, administration, receivership, liquidation or other formal winding-up procedure or that has otherwise ceased business.

Default ratings are not assigned prospectively to entities or their obligations; within this context, non-payment on an instrument that contains a deferral feature or grace period will generally not be considered a default until after the expiration of the deferral or grace period, unless a default is otherwise driven by bankruptcy or other similar circumstance, or by a distressed debt exchange.

In all cases, the assignment of a default rating reflects the agency's opinion as to the most appropriate rating category consistent with the rest of its universe of ratings and may differ from the definition of default under the terms of an issuer's financial obligations or local commercial practice.

Standalone Credit Profile

A standalone credit profile (SCP) measures the intrinsic vulnerability to default of a non-financial issuer without considering extraordinary impact (either support or interference) on the credit profile due to the relationship with, and credit quality of, related parties. The ordinary impact from related entities is considered as part of the SCP, while extraordinary impact is not considered in the SCP but is reflected in the rating. SCPs are not credit ratings but express a key component of the rating analysis. SCPs are indicated using the International Rating Scale but using lower-case letters, e.g. 'aaa' instead of 'AAA'. The relevant criteria may provide additional information on ordinary/extraordinary considerations.

Structured Finance

Ratings of structured finance obligations on the long-term scale consider the obligations' relative vulnerability to default. These ratings are typically assigned to an individual security or tranche in a transaction and not to an issuer.

AAA: Highest Credit Quality

'AAA' ratings denote the lowest expectation of default risk. They are assigned only in cases of exceptionally strong capacity for payment of financial commitments. This capacity is highly unlikely to be adversely affected by foreseeable events.

AA: Very High Credit Quality

'AA' ratings denote expectations of very low default risk. They indicate very strong capacity for payment of financial commitments. This capacity is not significantly vulnerable to foreseeable events.

A: High Credit Quality

'A' ratings denote expectations of low default risk. The capacity for payment of financial commitments is considered strong. This capacity may, nevertheless, be more vulnerable to adverse business or economic conditions than is the case for higher ratings.

BBB: Good Credit Quality

'BBB' ratings indicate that expectations of default risk are currently low. The capacity for payment of financial commitments is considered adequate, but adverse business or economic conditions are more likely to impair this capacity.

BB: Speculative

'BB' ratings indicate an elevated vulnerability to default risk, particularly in the event of adverse changes in business or economic conditions over time.

B: Highly Speculative

'B' ratings indicate that material default risk is present, but a limited margin of safety remains. Financial commitments are currently being met; however, capacity for continued payment is vulnerable to deterioration in the business and economic environment.

CCC: Substantial Credit Risk

Very low margin for safety. Default is a real possibility.

CC: Very High Levels of Credit Risk

Default of some kind appears probable.

C: Exceptionally High Levels of Credit Risk

Default appears imminent or inevitable.

D: Default

Indicates a default. Default generally is defined as one of the following:

- Failure to make payment of principal and/or interest under the contractual terms of the rated obligation;
- Bankruptcy filings, administration, receivership, liquidation or other winding-up or cessation of the business of an issuer/obligor; or
- Distressed exchange of an obligation, where creditors were offered securities with diminished structural or economic terms compared with the existing obligation to avoid a probable payment default.

Structured Finance Defaults

Imminent default, categorized under 'C', typically refers to the occasion where a payment default has been intimated by the issuer and is all but inevitable. This may, for example, be where an issuer has missed a scheduled payment but (as is typical) has a grace period during which it may cure the payment default. Another alternative would be where an issuer has formally announced a distressed debt exchange, but the date of the exchange still lies several days or weeks in the immediate future.

Additionally, in structured finance transactions, where analysis indicates that an instrument is irrevocably impaired such that it is not expected to pay interest and/or principal in full in accordance with the terms of the obligation's documentation during the life of the transaction, but where no payment default in

accordance with the terms of the documentation is imminent, the obligation will typically be rated in the 'C' category.

Structured Finance Write-downs

Where an instrument has experienced an involuntary and, in the agency's opinion, irreversible write-down of principal (i.e. other than through amortization, and resulting in a loss to the investor), a credit rating of 'D' will be assigned to the instrument. Where the agency believes the write-down may prove to be temporary (and the loss may be written up again in future if and when performance improves), then a credit rating of 'C' will typically be assigned. Should the write-down then later be reversed, the credit rating will be raised to an appropriate level for that instrument. Should the write-down later be deemed as irreversible, the credit rating will be lowered to 'D'.

Notes:

In the case of structured finance, while the ratings do not address the loss severity given default of the rated liability, loss severity assumptions on the underlying assets are nonetheless typically included as part of the analysis. Loss severity assumptions are used to derive pool cash flows available to service the rated liability.

The suffix 'sf' denotes an issue that is a structured finance transaction.

Enhanced Equipment Trust Certificates (EETCs) are corporate-structured hybrid debt securities that airlines typically use to finance aircraft equipment. Due to the hybrid characteristics of these bonds, Fitch's rating approach incorporates elements of both the structured finance and corporate rating methodologies. Although rated as asset-backed securities, unlike other structured finance ratings, EETC ratings involve a measure of recovery given default akin to ratings of financial obligations in corporate finance, as described above.

Short-Term Ratings Assigned to Issuers and Obligations

A short-term issuer or obligation rating is based in all cases on the short-term vulnerability to default of the rated entity and relates to the capacity to meet financial obligations in accordance with the documentation governing the relevant obligation. Short-term deposit ratings may be adjusted for loss severity. Short-Term Ratings are assigned to obligations whose initial maturity is viewed as "short term" based on market convention (a long-term rating can also be used to rate an issue with short maturity). Typically, this means up to 13 months for corporate, sovereign, and structured obligations and up to 36 months for obligations in U.S. public finance markets.

F1: Highest Short-Term Credit Quality

Indicates the strongest intrinsic capacity for timely payment of financial commitments; may have an added "+" to denote any exceptionally strong credit feature.

F2: Good Short-Term Credit Quality

Good intrinsic capacity for timely payment of financial commitments.

F3: Fair Short-Term Credit Quality

The intrinsic capacity for timely payment of financial commitments is adequate.

B: Speculative Short-Term Credit Quality

Minimal capacity for timely payment of financial commitments, plus heightened vulnerability to near term adverse changes in financial and economic conditions.

C: High Short-Term Default Risk

Default is a real possibility.

RD: Restricted Default

Indicates an entity that has defaulted on one or more of its financial commitments, although it continues to meet other financial obligations. Typically applicable to entity ratings only.

D: Default

Indicates a broad-based default event for an entity, or the default of a short-term obligation.

Relationship between Short-Term and Long-Term Ratings

The credit risks that drive the long-term rating and the short-term rating are linked but distinct. Some issuers may have a significantly stronger short-term credit profile than implied by the long-term rating. Some long-term factors such as strategy are unlikely to have an immediate impact on defaults. Conversely, factors such as liquidity can have a significant impact on short-term performance and will therefore gain more weight in the short-term rating.

The table in the margin reflects typical relationships between the long-term rating and the short-term rating. The two are linked, but at certain long-term rating levels ('A+' to 'BBB') more than one short-term rating are possible. The lower of the two short-term ratings indicated by the table is the base-line. Whether an issuer achieves the higher of two possible short-term ratings is determined by the analytical groups with reference to sector specific factors (such as Liquidity for example). Details are contained in the relevant criteria.

The table below is a guide only. Actual ratings assigned can differ from this correspondence consistent with the criteria employed by individual rating groups, where analytically merited.

Rating Correspondence Table	
Long-Term Rating	Short-Term Rating
AAA	F1+
AA+	F1+
AA	F1+
AA–	F1+
A+	F1 or F1+
A	F1 or F1+
A–	F2 or F1
BBB+	F2 or F1
BBB	F3 or F2
BBB–	F3
BB+	B
BB	B
BB–	B
B+	B
B	B
B–	B
CCC+/ CCC/ CCC–	C
CC	C
C	C
RD/D	RD/D

Ratings Definitions

Additional information regarding Ratings Definitions can also be found via the web link below under the heading: "Ratings Definitions", <https://www.fitchratings.com/products/rating-definitions>.

17 CFR 17g-7(b) Disclosure of Credit Rating Histories

Information pursuant to 17 CFR 17g-7(b) Disclosure of Credit Rating Histories, can be found at the web address: <https://www.fitchratings.com/ratings-history-disclosure>.