

## Credit Ratings Performance Statistics

A. Financial Institutions, Brokers, or Dealers - 1-Year Transition and Default Rates  
(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2017 - 12/31/2018 (%)			
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# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)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	14	100.0%																							
AA+	3		100.0%																						
AA	13			76.9%	23.1%																				
AA-	77			9.1%	88.3%																				2.6%
A+	95				6.3%	82.1%	4.2%		5.3%																2.1%
A	168					10.1%	86.9%	0.6%																	2.4%
A-	130						16.2%	77.7%	3.1%																3.1%
BBB+	170					1.2%	2.9%	1.8%	85.9%	5.3%	0.6%														2.4%
BBB	126				1.6%			0.8%	4.8%	85.7%	1.6%														5.6%
BBB-	152								8.6%	71.7%	2.0%	1.3%	12.5%										0.7%		3.3%
BB+	107								0.9%		62.6%	10.3%	5.6%	13.1%											7.5%
BB	74									1.4%	9.5%	71.6%	12.2%												5.4%
BB-	77											10.4%	62.3%	11.7%	2.6%	1.3%						1.3%			10.4%
B+	66												21.2%	59.1%	9.1%										10.6%
B	50													10.0%	68.0%	12.0%						2.0%			8.0%
B-	49														30.6%	46.9%					2.0%	2.0%			18.4%
CCC+																									
CCC	3																33.3%								66.7%
CCC-																									
CC	6																				83.3%				16.7%
C	1																					100.0%			
TOTAL	1381																								

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

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2015 - 12/31/2018 (%)			
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# of Ratings Outstanding	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+	CCC	CCC-	CC	C	Default	Paid Off	Withdrawn (other)	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	14	92.9%																							7.1%	
AA+	2		100.0%																							
AA	13			53.8%	38.5%																				7.7%	
AA-	79			8.9%	70.9%	5.1%			3.8%																11.4%	
A+	109				7.3%	55.0%	19.3%	3.7%			0.9%													1.8%	11.9%	
A	150				2.0%	14.7%	66.0%	5.3%	3.3%																8.7%	
A-	137					0.7%	20.4%	50.4%	21.2%	0.7%															6.6%	
BBB+	135					1.5%	3.7%	8.9%	57.0%	16.3%	1.5%														11.1%	
BBB	137				0.7%			1.5%	21.2%	43.8%	6.6%	5.1%	2.9%	10.2%											8.0%	
BBB-	183								1.1%	14.8%	42.1%	6.6%	2.7%	3.8%	8.2%								1.1%		19.7%	
BB+	79									5.1%	15.2%	38.0%	7.6%	12.7%	1.3%										20.3%	
BB	71									2.8%	1.4%	12.7%	42.3%	7.0%	5.6%	2.8%	1.4%						1.4%		22.5%	
BB-	59											1.7%	11.9%	40.7%	18.6%	5.1%						1.7%			20.3%	
B+	47											4.3%	6.4%	29.8%	25.5%	8.5%	4.3%						4.3%		17.0%	
B	47							2.1%						2.1%	14.9%	27.7%	21.3%				2.1%		10.6%		19.1%	
B-	43														9.3%	44.2%	9.3%						2.3%		34.9%	
CCC+																										
CCC	23															17.4%	34.8%				21.7%		8.7%		17.4%	
CCC-																										
CC																										
C																										
TOTAL	1328																									

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

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2008 - 12/31/2018 (%)		
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	15	46.7%	6.7%					6.7%																	40.0%
AA+	6		16.7%			33.3%																			50.0%
AA	35			5.7%	37.1%	22.9%	2.9%	5.7%	8.6%																17.1%
AA-	143			6.3%	24.5%	4.2%	10.5%	4.2%	4.9%	2.1%	1.4%		1.4%										1.4%		39.2%
A+	169				5.3%	16.6%	18.9%	10.1%	4.7%	1.8%	1.2%		0.6%												40.8%
A	132						17.4%	16.7%	6.8%	5.3%	3.8%	1.5%	2.3%	0.8%									3.8%		41.7%
A-	195				1.0%	1.5%	4.6%	6.7%	8.2%	4.6%	4.1%	1.0%	1.5%	2.6%	0.5%								3.1%		60.5%
BBB+	141					0.7%	0.7%	5.7%	7.1%	7.1%	6.4%	3.5%		0.7%									3.5%		64.5%
BBB	124							0.8%	11.3%	9.7%	4.8%	1.6%	5.6%	0.8%	0.8%	0.8%							3.2%		60.5%
BBB-	82						1.2%	1.2%	1.2%	7.3%	15.9%	4.9%	2.4%	2.4%		1.2%							3.7%		58.5%
BB+	39								2.6%	7.7%	12.8%	12.8%	7.7%	2.6%		10.3%							7.7%		35.9%
BB	67									9.0%	7.5%	9.0%	10.4%	11.9%	7.5%	3.0%							4.5%		37.3%
BB-	32								3.1%		3.1%	9.4%	3.1%	12.5%	12.5%	6.3%	3.1%						15.6%		31.3%
B+	48												4.2%	4.2%	8.3%	6.3%	8.3%				4.2%		14.6%		50.0%
B	40													15.0%	10.0%	10.0%					5.0%		10.0%		50.0%
B-	49									2.0%				4.1%	4.1%	8.2%	10.2%				2.0%		4.1%		65.3%
CCC+	1																						100.0%		
CCC	23									26.1%					4.3%								39.1%		30.4%
CCC-	1																								100.0%
CC	2																						50.0%		50.0%
C	1																						100.0%		
TOTAL	1345																								

B. Insurance Companies - 1-Year Transition and Default Rates  
(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2017 - 12/31/2018 (%)		
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	21			100.0%																					
AA-	155				97.4%	1.9%																		0.6%	
A+	144					88.9%	2.8%	4.9%																3.5%	
A	237					8.0%	88.2%	1.7%	0.4%															1.7%	
A-	192						4.7%	89.6%	0.5%	0.5%														4.7%	
BBB+	121							0.8%	95.9%	0.8%														2.5%	
BBB	41									85.4%	7.3%													7.3%	
BBB-	19									15.8%	78.9%		5.3%												
BB+	13										7.7%	53.8%	7.7%											30.8%	
BB	6											33.3%	50.0%											16.7%	
BB-	8												25.0%	12.5%	12.5%	12.5%								37.5%	
B+	10													10.0%	80.0%	10.0%									
B	15															60.0%	6.7%	13.3%						20.0%	
B-	7															42.9%	28.6%							28.6%	
CCC+																									
CCC																									
CCC-																									
CC																									
C																									
TOTAL	995																								

B. Insurance Companies - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2015 - 12/31/2018 (%)				
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+	5		100.0%																							
AA	18			100.0%																						
AA-	159			1.3%	91.8%	1.9%																		5.0%		
A+	148				1.4%	76.4%	8.1%	4.7%																9.5%		
A	251					9.6%	72.9%	10.4%	0.8%															6.4%		
A-	179					2.2%	9.5%	72.6%	3.4%	1.1%														11.2%		
BBB+	123						0.8%	11.4%	74.0%	3.3%														10.6%		
BBB	37								13.5%	48.6%	5.4%													32.4%		
BBB-	27					3.7%			3.7%	29.6%	37.0%		3.7%			3.7%		7.4%						11.1%		
BB+	7											42.9%												57.1%		
BB	9											22.2%	44.4%											33.3%		
BB-	4												50.0%		25.0%	25.0%										
B+	8													12.5%	37.5%	50.0%										
B	6															50.0%								50.0%		
B-	4															75.0%							25.0%			
CCC+																										
CCC																										
CCC-																										
CC																										
C																										
TOTAL	986																									

B. Insurance Companies - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2008 - 12/31/2018 (%)		
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	5		20.0%		60.0%																				20.0%
AA+	2		50.0%	50.0%																					
AA	13				23.1%	23.1%	15.4%	7.7%																	30.8%
AA-	38				26.3%	34.2%	10.5%	5.3%																	23.7%
A+	39				10.3%	20.5%	20.5%	15.4%	5.1%																28.2%
A	57					26.3%	15.8%	15.8%	5.3%	1.8%															35.1%
A-	50				2.0%	4.0%	12.0%	12.0%	4.0%	8.0%															58.0%
BBB+	46						4.3%	15.2%	13.0%	6.5%															60.9%
BBB	33						12.1%	3.0%	15.2%	9.1%															60.6%
BBB-	15									13.3%															86.7%
BB+	3										33.3%														66.7%
BB	8								12.5%		12.5%		12.5%		12.5%										50.0%
BB-	3												33.3%												66.7%
B+	1																								100.0%
B																									
B-																									
CCC+																									
CCC	1																								100.0%
CCC-																									
CC																									
C																									
TOTAL	314																								

### C. Corporate issuers - 1-Year Transition and Default Rates

(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2017 - 12/31/2018 (%)		
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+	1		100.0%																						
AA	9			66.7%	11.1%																				22.2%
AA-	18				72.2%																				27.8%
A+	57					75.4%	17.5%		1.8%														1.8%		3.5%
A	102					3.9%	80.4%	8.8%	1.0%																5.9%
A-	162						4.9%	79.0%	5.6%	2.5%	1.2%														6.8%
BBB+	252							5.2%	83.7%	6.0%	0.4%														4.8%
BBB	269							4.5%	88.8%	3.7%	0.4%														2.6%
BBB-	299							0.3%	6.0%	86.0%	3.3%	0.3%													4.0%
BB+	151								0.7%	11.9%	58.3%	15.9%	2.6%				3.3%						0.7%	0.7%	6.0%
BB	129								1.6%	7.8%	75.2%	2.3%	2.3%				1.6%								9.3%
BB-	120										10.8%	64.2%	10.0%	2.5%			2.5%								10.0%
B+	142									0.7%			13.4%	52.1%	15.5%	1.4%								2.1%	14.8%
B	224														5.4%	55.8%	11.2%	1.8%	1.8%			0.9%	0.9%	1.8%	20.5%
B-	121														3.3%	9.1%	52.1%	5.0%	5.8%	0.8%	2.5%	0.8%	3.3%	0.8%	16.5%
CCC+																									
CCC	33															6.1%	9.1%	3.0%	27.3%	9.1%	3.0%	3.0%	12.1%		27.3%
CCC-																									
CC	15																	6.7%			13.3%		73.3%	6.7%	
C	2																					50.0%	50.0%		
TOTAL	2107																								

### C. Corporate issuers - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2015 - 12/31/2018 (%)				
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+	2		50.0%		50.0%																					
AA	12			33.3%	16.7%																				50.0%	
AA-	17				52.9%		5.9%		5.9%																35.3%	
A+	54				3.7%	64.8%	18.5%	5.6%																1.9%	5.6%	
A	105					4.8%	61.0%	14.3%	5.7%	2.9%															11.4%	
A-	148						10.1%	62.2%	6.8%	2.0%						2.0%	0.7%								16.2%	
BBB+	253							10.3%	58.1%	12.6%	4.3%	0.4%	0.4%												13.8%	
BBB	246							0.4%	13.0%	60.2%	11.8%	2.4%	0.8%											0.4%	11.0%	
BBB-	302							0.3%	2.0%	17.5%	52.0%	6.3%	3.0%	1.3%			0.3%	0.3%					0.7%	0.3%	15.9%	
BB+	126									2.4%	26.2%	28.6%	17.5%	3.2%									0.8%	0.8%	20.6%	
BB	100										3.0%	14.0%	39.0%	9.0%	2.0%	6.0%	1.0%						1.0%	1.0%	24.0%	
BB-	110										1.8%	4.5%	18.2%	21.8%	18.2%	4.5%		0.9%	0.9%				3.6%		25.5%	
B+	106										0.9%	0.9%	3.8%	15.1%	21.7%	10.4%	5.7%		0.9%		1.9%	0.9%	2.8%	2.8%	32.1%	
B	121										0.8%			4.1%	5.8%	20.7%	9.9%	2.5%	3.3%		0.8%	0.8%	5.0%	10.7%	35.5%	
B-	59														6.8%	10.2%	6.8%	1.7%	8.5%	3.4%		1.7%	22.0%	1.7%	37.3%	
CCC+																										
CCC	37														5.4%	21.6%	10.8%		5.4%			2.7%	32.4%	2.7%	18.9%	
CCC-																										
CC	10																						90.0%		10.0%	
C	5																						100.0%			
TOTAL	1814																									



### C. Corporate issuers - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2008 - 12/31/2018 (%)				
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	3	33.3%																							66.7%	
AA+	8		12.5%		25.0%	12.5%	12.5%																		37.5%	
AA	15			13.3%	13.3%	6.7%		6.7%																	60.0%	
AA-	31				3.2%	16.1%	12.9%	6.5%	3.2%	3.2%															54.8%	
A+	57				3.5%	14.0%	22.8%	12.3%	7.0%	5.3%	1.8%												1.8%	31.6%		
A	138				1.4%	2.9%	19.6%	24.6%	10.1%	6.5%	1.4%	0.7%			0.7%	3.6%							0.7%	27.5%		
A-	142				2.8%	0.7%	3.5%	18.3%	20.4%	9.2%	8.5%		2.1%												34.5%	
BBB+	162						1.9%	6.8%	28.4%	17.9%	3.7%	1.9%													39.5%	
BBB	228							6.6%	14.5%	20.2%	8.8%	2.2%	0.9%	0.4%	0.4%	0.9%	0.4%						0.4%	1.8%	42.5%	
BBB-	187							2.1%	9.6%	11.8%	17.1%	3.2%	2.7%	0.5%	1.1%		1.1%						1.1%	0.5%	49.2%	
BB+	94							1.1%	3.2%	17.0%	16.0%	3.2%	2.1%	1.1%	1.1%	1.1%	1.1%						1.1%	3.2%	48.9%	
BB	82							1.2%		4.9%	11.0%	7.3%	8.5%	1.2%	1.2%	3.7%							7.3%	1.2%	52.4%	
BB-	72								1.4%	2.8%	4.2%	2.8%	12.5%	8.3%	5.6%	2.8%	1.4%						5.6%	2.8%	50.0%	
B+	71											1.4%	5.6%	7.0%	4.2%	2.8%		1.4%					14.1%	5.6%	57.7%	
B	104							1.0%			1.9%	1.0%	1.0%	1.9%		5.8%	1.0%						26.9%	1.9%	57.7%	
B-	55											1.8%	9.1%	3.6%		3.6%	1.8%		1.8%				25.5%	1.8%	50.9%	
CCC+	1																						100.0%			
CCC	26									3.8%						3.8%							69.2%		23.1%	
CCC-																										
CC	5																						80.0%		20.0%	
C	9																						100.0%			
TOTAL	1490																									

### D(i) Residential mortgage backed securities ("RMBS") - 1-Year Transition and Default Rates

(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2017 - 12/31/2018 (%)			
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	2390	88.3%		0.2%	0.04%		0.1%			0.04%						0.04%								11.2%	
AA+	159	28.3%	50.9%	0.6%	0.6%	0.6%	0.6%																	18.2%	
AA	816	32.4%	1.7%	45.7%		0.2%	2.8%	0.1%		0.4%			0.1%						0.1%					15.2%	1.2%
AA-	57	28.1%	10.5%	10.5%	36.8%			1.8%																12.3%	
A+	162	4.3%		18.5%	2.5%	64.8%	1.2%									0.6%								8.0%	
A	1620	5.6%	0.1%	10.9%	0.2%	2.4%	62.7%		0.1%	7.5%			0.7%			0.1%					0.1%		0.1%	9.1%	0.4%
A-	95	14.7%	4.2%		4.2%	7.4%	8.4%	34.7%				1.1%												25.3%	
BBB+	71	1.4%		5.6%	1.4%	14.1%	5.6%	5.6%	53.5%		1.4%			1.4%							1.4%			8.5%	
BBB	1374	0.9%		4.3%	0.1%	0.7%	15.4%	0.7%	0.9%	62.2%			3.8%			0.1%			0.2%				0.2%	7.2%	3.3%
BBB-	85				5.9%	11.8%	10.6%	8.2%	11.8%	15.3%	23.5%					1.2%			1.2%					10.6%	
BB+	127					6.3%	2.4%	7.9%	11.0%	18.1%	7.9%	33.1%				1.6%								11.8%	
BB	2295	0.2%		0.5%		0.4%	2.1%	0.3%	0.2%	8.4%	0.7%	1.5%	74.5%			2.2%			0.5%		0.1%	0.09%	0.3%	4.0%	4.0%
BB-	163							0.6%		4.3%		13.5%	14.1%	63.8%					0.6%					3.1%	
B+	94	1.1%							2.1%	1.1%	4.3%	16.0%	9.6%	30.9%	30.9%									4.3%	
B	1538			0.1%		0.3%	0.1%		0.1%	2.3%	0.2%	1.0%	20.8%	1.6%	1.4%	62.2%			2.3%		0.5%	0.3%	0.5%	3.8%	2.5%
B-	18													50.0%		16.7%	33.3%								
CCC+																									
CCC	1184						0.1%		0.1%	0.3%		0.2%	1.9%	0.1%	0.1%	12.1%	0.3%		71.6%		4.1%	3.5%	1.3%	2.2%	2.1%
CCC-																									
CC	1006															2.1%			7.9%		69.3%	15.9%	2.0%	1.1%	1.8%
C	1744															0.2%			0.1%		1.5%	86.6%	8.6%	1.8%	1.3%
TOTAL	14998																								

### D(i) Residential mortgage backed securities ("RMBS") - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2015 - 12/31/2018 (%)			
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	2603	51.9%		0.4%	0.04%	0.3%	0.3%	0.04%		0.1%			0.1%			0.2%								46.2%	0.3%
AA+	217	15.7%	12.4%	18.0%		1.8%	1.4%	0.5%		0.5%						1.4%								48.4%	
AA	961	18.9%	0.7%	16.2%		0.8%	6.2%	0.1%		7.2%			0.8%						0.1%				0.1%	46.0%	2.7%
AA-	79	13.9%	10.1%	3.8%	15.2%	5.1%	2.5%	1.3%								2.5%								45.6%	
A+	122	9.8%	5.7%	16.4%	5.7%	22.1%	1.6%	0.8%	2.5%	0.8%						0.8%								33.6%	
A	2147	8.8%	0.05%	6.1%	0.2%	2.4%	28.3%	0.05%	0.1%	7.2%	0.05%		1.2%	0.05%		0.3%		0.1%		0.05%	0.05%	0.5%	42.8%	1.8%	
A-	78	6.4%	2.6%	1.3%	1.3%	17.9%	2.6%	15.4%		1.3%		1.3%				3.8%								46.2%	
BBB+	90	1.1%	1.1%			13.3%	7.8%	11.1%	18.9%	2.2%	1.1%	2.2%	2.2%								1.1%			37.8%	
BBB	1774	3.3%	0.1%	6.3%		1.1%	12.5%	0.3%	1.1%	29.8%	0.1%	0.1%	6.6%			3.1%			0.4%			0.2%	1.8%	27.2%	6.1%
BBB-	97	14.4%		7.2%	6.2%	12.4%	3.1%	8.2%	6.2%	2.1%	1.0%		1.0%			3.1%			2.1%					33.0%	
BB+	43		2.3%		9.3%	7.0%	4.7%	4.7%	4.7%	4.7%	9.3%	9.3%	7.0%			2.3%			2.3%					32.6%	
BB	1857	0.8%		1.6%		0.6%	8.7%	0.3%	0.6%	8.2%	0.5%	0.7%	45.4%		0.2%	2.6%			1.1%		0.2%	0.4%	2.5%	20.8%	4.8%
BB-	36	44.4%		2.8%				5.6%	2.8%	5.6%	5.6%	8.3%							2.8%					19.4%	2.8%
B+	19	5.3%							10.5%			31.6%	15.8%	5.3%	21.1%				5.3%					5.3%	
B	1655	0.7%		1.9%		0.4%	6.3%			6.4%	0.2%	1.0%	26.2%	0.1%	0.4%	22.6%			5.1%		1.4%	1.5%	3.9%	18.6%	3.3%
B-	21											23.8%	9.5%	47.6%	4.8%	4.8%	9.5%								
CCC+																									
CCC	1843	0.05%		0.3%		0.1%	0.9%		0.1%	6.0%		0.1%	17.3%	0.16%	0.4%	12.9%	0.16%		27.0%		4.9%	9.5%	7.0%	11.1%	2.2%
CCC-																									
CC	2437			0.2%			0.3%			0.4%			10.0%	0.1%		9.9%			12.8%		21.3%	22.8%	12.2%	8.5%	1.5%
C	2474												0.2%	0.2%		1.1%			1.9%		5.9%	38.4%	29.3%	2.5%	20.6%
TOTAL	18553																								

### D(i) Residential mortgage backed securities ("RMBS") - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2008 - 12/31/2018 (%)			
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	22159	1.4%	0.1%	0.8%	0.03%	0.2%	2.7%	0.04%	0.03%	3.5%		0.03%	5.6%	0.02%		1.8%			1.6%		0.8%	1.6%	27.1%	38.3%	14.2%
AA+	810	1.6%	0.9%	1.7%		0.6%	7.2%			2.7%			12.7%	0.1%		5.9%			4.9%		1.7%	2.6%	10.1%	40.1%	7.0%
AA	1884	2.8%	0.3%	2.5%	0.2%	0.7%	3.8%	0.2%	0.2%	2.4%	0.2%	0.16%	8.9%	0.1%		5.7%	0.05%		5.4%		2.9%	4.7%	20.2%	32.4%	6.3%
AA-	493	0.6%		1.6%	1.0%	1.2%	6.3%	0.4%	1.0%	2.6%			9.7%			6.7%			3.2%		5.7%	4.9%	10.5%	39.4%	5.1%
A+	498	2.6%	0.2%	2.0%		2.0%	4.8%	0.2%	1.2%	3.4%	0.2%	0.4%	6.4%	0.2%	0.2%	6.6%			5.4%		5.0%	7.8%	17.1%	28.7%	5.4%
A	2062	1.0%	0.1%	1.6%	0.1%	0.8%	6.2%	0.5%	0.4%	2.5%	0.05%	0.2%	4.2%	0.1%	0.05%	3.6%	0.1%		4.7%		3.8%	6.2%	36.0%	21.7%	6.1%
A-	434	0.5%		0.9%		0.9%	3.5%	1.2%	0.2%	2.8%		0.5%	8.5%	0.2%	0.2%	8.3%			5.5%		5.3%	13.6%	17.5%	20.5%	9.9%
BBB+	529	0.2%		0.6%	0.2%	1.3%	1.5%	0.2%	0.9%	1.3%	0.9%	0.4%	4.0%	0.4%	0.2%	4.2%			6.0%		10.0%	13.0%	25.9%	24.6%	4.2%
BBB	2539	0.2%	0.04%	0.8%	0.04%	0.4%	2.6%	0.4%	0.4%	3.0%	0.3%	0.3%	3.9%		0.04%	2.7%			3.2%		3.7%	7.1%	47.4%	17.6%	6.1%
BBB-	375	0.3%				0.3%	1.6%		0.3%	0.8%	0.3%	1.3%	2.9%			2.4%			6.9%		4.8%	12.3%	27.7%	23.7%	14.4%
BB+	267					0.4%	4.1%		1.1%	1.5%			1.9%			2.6%	0.4%		5.6%		4.1%	13.9%	37.1%	20.2%	7.1%
BB	2557	0.1%		0.1%		0.04%	0.6%		0.4%	0.9%	0.1%	0.1%	2.8%		0.1%	2.6%			2.7%		3.4%	8.4%	63.6%	6.6%	7.6%
BB-	147									2.0%		0.7%	2.0%			6.1%			2.0%		6.8%	8.8%	46.3%	18.4%	6.8%
B+	104	1.0%								4.8%	1.0%	1.9%	1.0%		2.9%	1.0%			1.0%		2.9%	6.7%	51.0%	17.3%	7.7%
B	2201	0.1%		0.05%			0.2%			0.5%		0.05%	1.3%	0.2%	0.1%	1.7%			1.3%		1.9%	7.9%	70.4%	5.4%	9.0%
B-	53						1.9%			1.9%			3.8%			5.7%			5.7%		5.7%	7.5%	32.1%	30.2%	5.7%
CCC+	1																						100.0%		
CCC	2644	0.2%	0.04%	0.04%			0.1%			0.1%		0.2%	0.7%		0.2%	0.5%			1.1%		0.8%	4.5%	85.1%	1.5%	5.0%
CCC-	3																		66.7%		33.3%				
CC	3577						0.03%		0.03%				0.1%	0.1%	0.03%	0.2%			0.3%		0.6%	1.6%	94.4%	0.8%	1.9%
C	4927							0.02%		0.02%		0.02%	0.1%	0.1%		0.04%			0.2%		0.1%	1.1%	90.9%	0.8%	6.6%
TOTAL	48264																								

### D(ii) Commercial mortgage backed securities ("CMBS") - 1-Year Transition and Default Rates

(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2017 - 12/31/2018 (%)			
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	2410	91.7%		0.04%																				8.2%	
AA+	7		100.0%																						
AA	117	8.5%	0.9%	81.2%																				9.4%	
AA-	381	0.8%		0.8%	96.1%			0.5%																1.8%	
A+	38	63.2%				23.7%																		13.2%	
A	226	19.0%		4.9%		1.3%	56.6%			0.4%														17.7%	
A-	401			0.2%			2.2%	93.8%			0.2%													3.2%	0.2%
BBB+	63								79.4%	14.3%														6.3%	
BBB	135	3.7%					3.7%	0.7%		70.4%			1.5%			0.7%								19.3%	
BBB-	475			0.2%		0.2%	0.6%	0.2%		0.4%	94.3%		1.1%	0.2%										2.5%	0.2%
BB+	45									2.2%	13.3%	80.0%						2.2%						2.2%	
BB	219	1.8%					0.9%			4.1%		0.5%	70.8%			1.8%	0.5%		1.4%					17.8%	0.5%
BB-	236													93.2%		0.8%	1.7%							4.2%	
B+	6														50.0%	16.7%							16.7%	16.7%	
B	184	1.6%								1.1%			2.2%			77.2%			4.9%		1.1%			0.5%	11.4%
B-	191																91.1%		3.7%					5.2%	
CCC+	1																	100.0%							
CCC	118	0.8%					2.5%						1.7%			10.2%			40.7%		8.5%	9.3%	2.5%	23.7%	
CCC-																									
CC	108	1.9%								0.9%			1.9%			3.7%			5.6%		49.1%	23.1%	4.6%	9.3%	
C	240									0.4%			0.4%						1.7%		1.3%	55.4%	35.8%	2.9%	2.1%
TOTAL	5601																								

### D(ii) Commercial mortgage backed securities ("CMBS") - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2015 - 12/31/2018 (%)			
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	1916	62.8%		0.1%																				37.1%	
AA+	11	18.2%	27.3%																					54.5%	
AA	154	10.4%	1.9%	47.4%						0.6%														39.6%	
AA-	186	2.2%		4.8%	84.9%	1.1%		0.5%																6.5%	
A+	19	5.3%		10.5%		31.6%																		52.6%	
A	302	3.3%	0.3%	2.6%		0.3%	32.5%			0.3%			0.3%						0.3%					59.9%	
A-	268	0.4%	0.4%	1.1%	3.0%	0.4%	6.7%	76.1%		0.4%		0.4%												9.0%	2.2%
BBB+	48			2.1%					66.7%	12.5%									2.1%					16.7%	
BBB	170	4.7%		1.8%		0.6%	5.3%	0.6%		31.2%			1.8%			1.2%			0.6%		0.6%	0.6%	0.6%	50.6%	
BBB-	284	0.4%		0.7%	1.4%	0.4%	0.7%	0.7%		2.1%	75.0%		1.8%	0.4%					0.6%			0.4%	0.4%	14.8%	1.1%
BB+	34						2.9%			2.9%	17.6%	50.0%							2.9%					23.5%	
BB	270	4.1%					1.1%			3.7%		0.4%	44.8%			2.6%	0.4%		1.9%		0.4%	0.7%	0.7%	38.9%	0.4%
BB-	90													76.7%		2.2%	4.4%							16.7%	
B+	4														25.0%	25.0%								50.0%	
B	243	4.1%					1.2%			0.8%			0.8%			45.7%			4.1%		0.4%	1.2%	4.1%	37.4%	
B-	75															2.7%	62.7%		9.3%		2.7%		1.3%	21.3%	
CCC+	1																	100.0%							
CCC	255	2.7%					2.0%			1.2%			4.7%			5.5%			12.5%		9.8%	9.4%	11.8%	38.4%	2.0%
CCC-																									
CC	227	0.4%					0.4%			0.9%			1.3%			4.8%			6.2%		15.4%	22.5%	27.8%	18.5%	1.8%
C	437	0.2%											0.5%			0.5%			1.4%		0.7%	19.9%	72.1%	2.7%	2.1%
TOTAL	4994																								

### D(ii) Commercial mortgage backed securities ("CMBS") - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2008 - 12/31/2018 (%)			
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	3469	0.9%		0.03%			0.3%			0.1%			0.2%			0.3%			0.3%		0.2%	0.5%	1.6%	76.5%	19.2%
AA+	198	2.0%	1.0%				0.5%						0.5%			1.5%			0.5%		2.0%	4.0%	8.6%	78.3%	1.0%
AA	503	1.6%	0.4%	4.8%		0.4%	0.4%			0.4%			1.0%			0.4%			2.0%		1.4%	3.2%	14.5%	67.6%	2.0%
AA-	238	2.1%		0.4%			0.8%			1.3%			0.8%			0.8%			2.1%		3.4%	7.6%	16.8%	61.3%	2.5%
A+	206	1.0%		1.0%		0.5%	0.5%			1.0%						2.4%			1.0%		1.0%	5.3%	16.5%	68.0%	1.9%
A	465	1.5%	0.2%	0.2%			1.7%			1.1%	0.2%		0.4%			1.7%			1.9%		0.4%	3.4%	26.7%	58.1%	2.4%
A-	287	0.3%					1.7%			0.3%			1.0%			0.7%			1.4%		4.2%	5.2%	32.1%	51.2%	1.7%
BBB+	321	0.9%					0.6%		0.3%	3.4%			0.6%			0.6%			0.6%		1.6%	5.0%	38.0%	46.7%	1.6%
BBB	513	0.6%		0.6%		0.4%	0.2%			1.4%			0.6%			0.8%			1.4%		1.6%	2.1%	41.7%	44.8%	3.9%
BBB-	443	1.8%				0.2%				0.2%	0.5%		0.5%			0.5%			0.9%		1.1%	1.6%	45.4%	40.2%	7.2%
BB+	277	1.8%					0.4%			0.4%		1.1%	0.7%			1.4%			0.4%		0.7%	1.8%	58.1%	31.0%	2.2%
BB	347	0.9%								0.3%			2.0%			0.3%			0.3%		0.9%	3.5%	62.8%	22.2%	6.9%
BB-	238	0.4%					0.8%							0.4%		1.3%			0.4%		0.4%	1.7%	76.1%	18.1%	0.4%
B+	210	0.5%											1.0%		0.5%				0.5%		0.5%	1.0%	77.6%	17.6%	1.0%
B	245	0.4%					0.4%									1.2%					0.4%	1.2%	75.5%	14.3%	6.5%
B-	230	0.9%								0.4%						0.4%	0.4%					2.2%	83.0%	10.9%	1.7%
CCC+	1																	100.0%							
CCC	72																		2.8%				87.5%	5.6%	4.2%
CCC-																									
CC	31																						96.8%		3.2%
C	115																						88.7%	7.0%	4.3%
TOTAL	8409																								

### D(iii) Collateralized loan obligations ("CLOs") - 1-Year Transition and Default Rates

(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2017 - 12/31/2018 (%)		
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	817	58.6%																						41.4%	
AA+	17		58.8%																					41.2%	
AA	157	1.3%	1.3%	59.2%																				38.2%	
AA-																									
A+	12					50.0%																		50.0%	
A	93					1.1%	62.4%																	36.6%	
A-	11						9.1%	81.8%																9.1%	
BBB+	14								14.3%															85.7%	
BBB	86									62.8%														37.2%	
BBB-	13										69.2%													30.8%	
BB+	11											36.4%												63.6%	
BB	94												61.7%											38.3%	
BB-	2													50.0%										50.0%	
B+	3																							100.0%	
B	16															62.5%								37.5%	
B-	77																64.9%							35.1%	
CCC+																									
CCC																									
CCC-																									
CC	1																						100.0%		
C																									
TOTAL	1424																								



D(iii) Collateralized loan obligations ("CLOs") - 3-Year Transition and Default Rates  
(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2015 - 12/31/2018 (%)			
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	537	4.5%																						95.5%	
AA+	43																							100.0%	
AA	90	1.1%																						98.9%	
AA-																									
A+	22					4.5%																		95.5%	
A	69						1.4%																	98.6%	
A-	5						20.0%																	80.0%	
BBB+	16								6.3%															93.8%	
BBB	82									1.2%														98.8%	
BBB-	6																							100.0%	
BB+	12														33.3%									66.7%	
BB	80														12.5%									87.5%	
BB-	5																							100.0%	
B+	2																							100.0%	
B	24															8.3%								91.7%	
B-	61																24.6%							75.4%	
CCC+																									
CCC	6																						50.0%	50.0%	
CCC-																									
CC	3																						100.0%		
C	2																						100.0%		
TOTAL	1065																								

D(iii) Collateralized loan obligations ("CLOs") - 10-Year Transition and Default Rates  
(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2008 - 12/31/2018 (%)				
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	145																							95.9%	4.1%	
AA+	2																							100.0%		
AA	57																							94.7%	5.3%	
AA-	1																							100.0%		
A+	2																							50.0%	50.0%	
A	74																							94.6%	5.4%	
A-	13																							84.6%	15.4%	
BBB+	10																							90.0%	10.0%	
BBB	76																						2.6%	89.5%	7.9%	
BBB-	8																						12.5%	50.0%	37.5%	
BB+	2																							100.0%		
BB	53																						17.0%	77.4%	5.7%	
BB-	6																							83.3%	16.7%	
B+	1																							100.0%		
B	19																						42.1%	47.4%	10.5%	
B-	1																								100.0%	
CCC+																										
CCC	10																						80.0%	20.0%		
CCC-																										
CC	7																						57.1%	42.9%		
C	9																						100.0%			
TOTAL	496																									

### D(iv) Collateralized debt obligations ("CDOs") - 1-Year Transition and Default Rates

(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2017 - 12/31/2018 (%)		
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	80.2%																						17.6%	2.2%
AA+	11	9.1%	54.5%																					36.4%	
AA	48	6.3%		64.6%																				27.1%	2.1%
AA-	20			5.0%	95.0%																				
A+	36			2.8%		77.8%																		16.7%	2.8%
A	129			9.3%			55.8%																	33.3%	1.6%
A-	29							89.7%																10.3%	
BBB+	31						6.5%		77.4%	3.2%														9.7%	3.2%
BBB	113						16.8%	1.8%	0.9%	72.6%														8.0%	
BBB-	30										70.0%	3.3%		16.7%										10.0%	
BB+	19					5.3%	5.3%	5.3%		10.5%		47.4%		5.3%										21.1%	
BB	82						1.2%			20.7%	4.9%	2.4%	57.3%	1.2%										11.0%	1.2%
BB-	2												50.0%											50.0%	
B+	4									25.0%			25.0%		50.0%										
B	57						1.8%	1.8%		3.5%	5.3%		10.5%		1.8%	61.4%	1.8%						1.8%	7.0%	3.5%
B-	3												33.3%			33.3%								33.3%	
CCC+																									
CCC	96												3.1%		1.0%	12.5%			61.5%					18.8%	3.1%
CCC-																									
CC	94												1.1%								12.8%		62.8%	6.4%	4.3%
C	554	0.4%								0.2%									0.4%			1.1%	72.7%	5.1%	2.2%
TOTAL	1449																								

### D(iv) Collateralized debt obligations ("CDOs") - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2015 - 12/31/2018 (%)		
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	100	69.0%																						26.0%	5.0%
AA+	37		13.5%	5.4%																				78.4%	2.7%
AA	33	6.1%		30.3%																				60.6%	3.0%
AA-	12			8.3%	75.0%																			16.7%	
A+	33			3.0%		45.5%																		48.5%	3.0%
A	140	0.7%		12.9%	1.4%	0.7%	40.7%																	40.7%	2.9%
A-	29					3.4%		75.9%	3.4%															10.3%	6.9%
BBB+	28							3.6%	67.9%	3.6%														21.4%	3.6%
BBB	118			0.8%		0.8%	18.6%			48.3%	2.5%													24.6%	4.2%
BBB-	30									6.7%	36.7%	13.3%		6.7%										30.0%	6.7%
BB+	14					7.1%	7.1%				14.3%	14.3%		7.1%										42.9%	7.1%
BB	113	0.9%		0.9%		0.9%	4.4%	1.8%		15.9%	3.5%		29.2%									0.9%	28.3%	13.3%	
BB-	3																33.3%							66.7%	
B+	4																							100.0%	
B	101						5.9%			10.9%		1.0%	12.9%		1.0%	30.7%								24.8%	12.9%
B-	11									9.1%			9.1%											72.7%	9.1%
CCC+																									
CCC	122						1.6%	0.8%		1.6%			6.6%		0.8%	9.8%			32.8%					30.3%	15.6%
CCC-																									
CC	122			1.6%									0.8%			3.3%			15.6%		32.8%	2.5%	6.6%	25.4%	11.5%
C	877	0.2%								0.2%			0.1%						1.5%		2.9%	46.3%	9.7%	4.2%	34.9%
TOTAL	1927																								

### D(iv) Collateralized debt obligations ("CDOs") - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2008 - 12/31/2018 (%)			
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	992	5.0%		2.3%		0.1%	4.0%	0.1%		4.0%			2.2%			0.2%			0.3%		0.4%	0.5%	7.6%	65.4%	7.9%
AA+	94		5.3%	3.2%			6.4%			1.1%			1.1%						1.1%			1.1%	12.8%	63.8%	4.3%
AA	292			2.1%			1.0%			2.4%			4.5%			6.8%			5.8%		0.7%	1.7%	17.5%	47.9%	9.6%
AA-	73				8.2%		4.1%	2.7%					1.4%			1.4%			1.4%			1.4%	12.3%	47.9%	19.2%
A+	113					7.1%	0.9%									3.5%						4.4%	16.8%	57.5%	9.7%
A	457	0.2%					7.7%			0.7%			0.2%			0.2%			3.9%		3.5%	11.8%	10.9%	39.6%	21.2%
A-	219	0.5%						6.4%	0.9%	1.4%			0.5%			0.9%			4.6%		1.8%	26.0%	14.2%	24.2%	18.7%
BBB+	118						0.8%		2.5%	1.7%			1.7%		0.8%				1.7%		5.9%	17.8%	23.7%	33.1%	10.2%
BBB	398							0.5%		8.8%	1.0%		0.3%			0.5%			0.3%		0.8%	16.8%	15.8%	36.2%	19.1%
BBB-	135							0.7%	6.7%		4.4%		0.7%			0.7%	0.7%				1.5%	17.0%	22.2%	34.8%	10.4%
BB+	79	1.3%					1.3%					2.5%			1.3%						6.3%	15.2%	20.3%	38.0%	13.9%
BB	319												4.4%						0.3%		0.9%	12.5%	23.8%	40.1%	17.9%
BB-	68										1.5%											16.2%	27.9%	36.8%	17.6%
B+	51																		3.9%			9.8%	29.4%	47.1%	9.8%
B	309										0.3%					4.5%			0.3%			10.7%	23.6%	31.7%	28.8%
B-	110																					24.5%	51.8%	8.2%	15.5%
CCC+	13																					7.7%	46.2%	30.8%	15.4%
CCC	291																		5.2%			7.2%	44.7%	12.7%	30.2%
CCC-	3																					33.3%	33.3%	33.3%	
CC	373																				4.8%	2.9%	72.4%	2.4%	17.4%
C	455																					1.8%	45.5%	2.2%	50.5%
TOTAL	4962																								

## D(v) Asset-backed commercial paper ("ABCP") - 1-Year Transition and Default Rates

(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)						Other Outcomes During 12/31/2017 - 12/31/2018 (%)		
Credit Rating	# of Ratings Outstanding	F1+	F1	F2	F3	B	C	Default	Paid Off	Withdrawn (other)
F1+	5	100.0%								
F1	28		100.0%							
F2	5		20.0%	60.0%					20.0%	
F3										
B										
C										
TOTAL	38									

## D(v) Asset-backed commercial paper ("ABCP") - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)						Other Outcomes During 12/31/2015 - 12/31/2018 (%)		
Credit Rating	# of Ratings Outstanding	F1+	F1	F2	F3	B	C	Default	Paid Off	Withdrawn (other)
F1+	5	80.0%							20.0%	
F1	28		92.9%						3.6%	3.6%
F2	5		20.0%	60.0%					20.0%	
F3										
B										
C										
TOTAL	38									

## D(v) Asset-backed commercial paper ("ABCP") - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)						Other Outcomes During 12/31/2008 - 12/31/2018 (%)		
Credit Rating	# of Ratings Outstanding	F1+	F1	F2	F3	B	C	Default	Paid Off	Withdrawn (other)
F1+	45	4.4%	13.3%						57.8%	24.4%
F1	57	3.5%	19.3%	3.5%					24.6%	49.1%
F2	1								100.0%	
F3	1								100.0%	
B										
C										
TOTAL	104									

### D(vi) Other asset-backed securities ("other ABS") - 1-Year Transition and Default Rates

(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2017 - 12/31/2018 (%)			
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	1742	75.7%		0.3%			0.1%						0.2%											23.7%	
AA+	58	19.0%	55.2%																					24.1%	1.7%
AA	449	15.8%	1.1%	69.9%						1.1%														11.8%	0.2%
AA-	16	6.3%	6.3%	31.3%	37.5%																			18.8%	
A+	126	0.8%		4.0%	0.8%	65.1%				5.6%														23.8%	
A	617	2.1%	0.3%	5.2%	0.5%	1.6%	76.8%			1.0%			0.2%			1.0%								11.2%	0.2%
A-	118		1.7%	0.8%			5.1%	27.1%			52.5%													12.7%	
BBB+	129			0.8%		0.8%	1.6%	11.6%	35.7%		26.4%	5.4%												17.8%	
BBB	267			1.9%	0.4%		4.9%	1.5%	2.2%	67.8%		3.0%	0.4%			1.1%								16.9%	
BBB-	46								2.2%		63.0%	2.2%												32.6%	
BB+	18						5.6%	5.6%	5.6%	11.1%	5.6%	66.7%													
BB	93							1.1%		6.5%	2.2%	2.2%	62.4%	1.1%		11.8%								12.9%	
BB-	12										8.3%			75.0%										16.7%	
B+	10									10.0%				10.0%	50.0%									30.0%	
B	70	1.4%								1.4%				1.4%		85.7%								10.0%	
B-	16													6.3%			25.0%		68.8%						
CCC+																									
CCC	14													21.4%					71.4%		7.1%				
CCC-																									
CC	17																				100.0%				
C	34																					100.0%			
TOTAL	3852																								

### D(vi) Other asset-backed securities ("other ABS") - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2015 - 12/31/2018 (%)		
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	1845	36.2%		1.5%			0.1%			0.9%			0.5%			2.1%	0.1%		0.2%					55.4%	3.0%
AA+	36	13.9%		2.8%		5.6%				2.8%						5.6%								66.7%	2.8%
AA	327	19.6%	0.3%	23.2%		0.9%	1.8%			0.6%			0.3%			0.9%								50.8%	1.5%
AA-	35	17.1%		17.1%	14.3%	2.9%		2.9%								5.7%								40.0%	
A+	186	2.7%	5.4%	12.9%		23.1%				4.3%						2.7%								39.2%	9.7%
A	693	3.9%	0.6%	11.5%	0.1%	1.0%	41.8%	0.6%	2.0%	2.7%			0.1%	0.1%		1.7%	0.1%		0.1%					32.5%	0.9%
A-	118					0.8%	7.6%	10.2%			39.8%													41.5%	
BBB+	191	0.5%					1.6%	3.1%	5.8%	0.5%		2.6%												16.2%	69.6%
BBB	244	3.7%		1.2%	0.8%	0.4%	2.9%	0.8%	2.0%	19.7%	0.4%	3.7%	0.8%			1.2%			0.4%			0.4%	56.1%	5.3%	
BBB-	46			2.2%				2.2%			4.3%		6.5%											56.5%	28.3%
BB+	27									3.7%	3.7%	29.6%		14.8%										22.2%	25.9%
BB	72			4.2%			2.8%	1.4%		9.7%	5.6%	1.4%	13.9%	1.4%		1.4%					1.4%			43.1%	13.9%
BB-	23			8.7%			4.3%				4.3%		4.3%	8.7%										30.4%	39.1%
B+	14						7.1%							7.1%										35.7%	50.0%
B	61												6.6%	1.6%	1.6%	6.6%			1.6%		1.6%		3.3%	19.7%	57.4%
B-	60																		16.7%		5.0%		6.7%	3.3%	68.3%
CCC+																									
CCC	12													8.3%					8.3%		33.3%			25.0%	25.0%
CCC-																									
CC	21							4.8%		4.8%			9.5%			9.5%					33.3%			28.6%	9.5%
C	63									9.5%									3.2%		3.2%	54.0%		9.5%	20.6%
TOTAL	4074																								



### D(vi) Other asset-backed securities ("other ABS") - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2008 - 12/31/2018 (%)			
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	2835	10.0%		0.8%	0.04%	0.2%	1.1%	0.3%	0.04%	1.1%			0.5%			1.8%	0.1%		0.5%		0.1%	0.1%		79.5%	3.8%
AA+	50			2.0%		4.0%	24.0%			12.0%						4.0%			2.0%		2.0%	4.0%	4.0%	42.0%	
AA	286	0.3%		3.8%		0.3%	1.4%	0.7%	0.3%	1.0%		0.3%	0.7%								0.3%	2.1%		82.5%	5.9%
AA-	86				3.5%			1.2%																94.2%	1.2%
A+	146			0.7%																		2.7%		91.8%	4.8%
A	510	2.4%		1.4%	0.4%	0.8%	3.5%		0.2%	2.5%	0.6%	0.4%	0.2%	0.4%		1.2%			0.6%		1.4%	1.4%		75.7%	7.1%
A-	47							2.1%		4.3%														89.4%	4.3%
BBB+	322																					1.2%		62.7%	36.0%
BBB	331									0.6%			0.3%			0.3%			0.3%		1.2%	2.1%	0.3%	75.5%	19.3%
BBB-	99										1.0%										1.0%			79.8%	18.2%
BB+	46							2.2%														2.2%	4.3%	65.2%	26.1%
BB	69												2.9%								1.4%		4.3%	73.9%	17.4%
BB-	27													3.7%										88.9%	7.4%
B+	6																						33.3%	16.7%	50.0%
B	28																						7.1%	46.4%	46.4%
B-	11																						9.1%	63.6%	27.3%
CCC+																									
CCC	33																						18.2%	30.3%	51.5%
CCC-																									
CC	29																						37.9%	3.4%	58.6%
C	127																					0.8%	50.4%	1.6%	47.2%
TOTAL	5088																								

D(vii) Other Structured Finance Products ("other SFPs") - 1-Year Transition and Default Rates  
(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2017 - 12/31/2018 (%)				
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	407	81.1%																						14.7%	4.2%	
AA+	6		100.0%																							
AA	91			87.9%																				6.6%	5.5%	
AA-	2			50.0%	50.0%																					
A+	5				20.0%	60.0%																			20.0%	
A	47					4.3%	80.9%	2.1%																2.1%	10.6%	
A-	5						20.0%	80.0%																		
BBB+	11						9.1%		90.9%																	
BBB	3							33.3%		33.3%														33.3%		
BBB-	1								100.0%																	
BB+																										
BB																										
BB-																										
B+																										
B	3										33.3%		33.3%												33.3%	
B-																										
CCC+																										
CCC																										
CCC-																										
CC																										
C																										
TOTAL	581																									

D(vii) Other Structured Finance Products ("other SFPs") - 3-Year Transition and Default Rates  
(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2015 - 12/31/2018 (%)			
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	427	65.8%																						23.7%	10.5%
AA+	7		14.3%																						85.7%
AA	77	2.6%	5.2%	61.0%																				16.9%	14.3%
AA-																									
A+	6			50.0%	16.7%																				33.3%
A	43						67.4%	2.3%																23.3%	7.0%
A-	4					25.0%	25.0%																	25.0%	25.0%
BBB+	15					13.3%	33.3%	20.0%	13.3%																20.0%
BBB	18					5.6%	11.1%	5.6%	16.7%															38.9%	22.2%
BBB-	5								80.0%															20.0%	
BB+	3				33.3%																			33.3%	33.3%
BB	1																							100.0%	
BB-																									
B+	1								100.0%																
B																									
B-	2												50.0%												50.0%
CCC+	2										50.0%														50.0%
CCC																									
CCC-																									
CC																									
C																									
TOTAL	611																								

D(vii) Other Structured Finance Products ("other SFPs") - 10-Year Transition and Default Rates  
(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2008 - 12/31/2018 (%)				
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	378	18.0%		0.8%		0.8%	1.9%	0.8%	1.9%															54.2%	21.7%	
AA+	4																								100.0%	
AA	32			25.0%																				53.1%	21.9%	
AA-	1																								100.0%	
A+	48						43.8%																	47.9%	8.3%	
A	6						33.3%																	50.0%	16.7%	
A-																										
BBB+	1						100.0%																			
BBB																										
BBB-																										
BB+																										
BB																										
BB-																										
B+																										
B	1																								100.0%	
B-																										
CCC+																										
CCC																										
CCC-																										
CC																										
C																										
TOTAL	471																									

E(i) Sovereign issuers - 1-Year Transition and Default Rates  
(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2017 - 12/31/2018 (%)			
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	100.0%																								
AA+	5		100.0%																							
AA	9			88.9%	11.1%																					
AA-	7			14.3%	85.7%																					
A+	9				22.2%	77.8%																				
A	5						100.0%																			
A-	6							83.3%	16.7%																	
BBB+	5							20.0%	80.0%																	
BBB	12							16.7%	83.3%																	
BBB-	12									91.7%	8.3%															
BB+	6										66.7%	16.7%	16.7%													
BB	10									10.0%	30.0%	50.0%	10.0%													
BB-	7											14.3%	85.7%													
B+	12													83.3%	8.3%	8.3%										
B	12														75.0%	25.0%										
B-	8												12.5%		25.0%	62.5%										
CCC+																										
CCC																										
CCC-																										
CC	1																				100.0%					
C																										
TOTAL	153																									

E(i) Sovereign issuers - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2015 - 12/31/2018 (%)				
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		60.0%	40.0%																						
AA	10			60.0%	30.0%	10.0%																				
AA-	4			25.0%	75.0%																					
A+	7				42.9%	28.6%	28.6%																			
A	5					60.0%	40.0%																			
A-	7					14.3%		57.1%	14.3%			14.3%														
BBB+	9						11.1%	22.2%	33.3%	22.2%	11.1%															
BBB	5								20.0%	80.0%																
BBB-	16								6.3%	18.8%	43.8%	18.8%	6.3%	6.3%												
BB+	5									20.0%	20.0%		40.0%	20.0%												
BB	5											60.0%	20.0%	20.0%												
BB-	10												10.0%	40.0%	30.0%	10.0%	10.0%									
B+	14										7.1%		7.1%	7.1%	42.9%	14.3%	7.1%					14.3%				
B	11															54.5%	36.4%					9.1%				
B-	2															50.0%	50.0%									
CCC+																										
CCC	3													33.3%			33.3%					33.3%				
CCC-																										
CC																										
C																										
TOTAL	145																									

E(i) Sovereign issuers - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2008 - 12/31/2018 (%)		
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	29	69.0%	10.3%	13.8%		3.4%		3.4%																	
AA+	4	25.0%		25.0%	25.0%		25.0%																		
AA	8		12.5%	25.0%	12.5%		12.5%	12.5%		12.5%	12.5%														
AA-	4				25.0%	25.0%				25.0%	25.0%														
A+	8			12.5%	50.0%	37.5%																			
A	6					16.7%	33.3%		16.7%					16.7%									16.7%		
A-	6				16.7%	16.7%		33.3%				16.7%													16.7%
BBB+	6							16.7%	33.3%		16.7%	16.7%													16.7%
BBB	3										66.7%				33.3%										
BBB-	10						10.0%	10.0%	10.0%	20.0%	20.0%	20.0%		10.0%											
BB+	8									25.0%	12.5%	12.5%	25.0%			12.5%							12.5%		
BB	4									50.0%			25.0%		25.0%										
BB-	8										12.5%	12.5%	37.5%		25.0%	12.5%									
B+	9													11.1%	11.1%	44.4%							22.2%		11.1%
B	7													14.3%	14.3%	14.3%	14.3%						28.6%		14.3%
B-	7													14.3%	14.3%		14.3%								57.1%
CCC+																									
CCC																									
CCC-																									
CC																									
C																									
TOTAL	127																								

### E(ii) U.S. Public Finance - 1-Year Transition and Default Rates

(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2017 - 12/31/2018 (%)		
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	472	94.5%	0.6%																						4.9%
AA+	557	1.6%	93.9%	0.7%				0.4%																	3.4%
AA	654	0.5%	2.1%	93.0%	0.3%	0.2%																			4.0%
AA-	571			4.4%	90.2%	1.2%	0.2%	0.4%	0.2%							0.2%									3.3%
A+	417			0.5%	8.6%	84.9%	1.2%	0.2%	0.2%																4.3%
A	324				1.9%	7.7%	81.5%	2.5%	2.2%	0.3%															4.0%
A-	248				0.4%	0.8%	3.2%	85.5%	3.2%	0.4%	1.6%												0.4%		4.4%
BBB+	149						4.7%	7.4%	70.5%	10.1%	0.7%	1.3%													5.4%
BBB	148		0.7%					0.7%	4.7%	78.4%	4.7%	2.0%		0.7%											8.1%
BBB-	161							0.6%	1.2%	5.0%	82.0%	1.2%		0.6%				0.6%						0.6%	8.1%
BB+	60									1.7%	11.7%	81.7%	1.7%											1.7%	1.7%
BB	42										2.4%	2.4%	78.6%	4.8%									2.4%	2.4%	7.1%
BB-	21												9.5%	71.4%					4.8%					4.8%	9.5%
B+	13												7.7%		69.2%				7.7%					7.7%	7.7%
B	13															92.3%									7.7%
B-	7																85.7%						14.3%		
CCC+																									
CCC	6																		83.3%						16.7%
CCC-																									
CC	4																				100.0%				
C	6																					83.3%	16.7%		
TOTAL	3873																								



### E(ii) U.S. Public Finance - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2015 - 12/31/2018 (%)		
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	444	72.3%	4.7%	0.7%	0.5%																				21.8%
AA+	478	8.8%	72.0%	5.2%	0.8%	0.2%	0.2%	0.4%																0.2%	12.1%
AA	628	1.9%	15.3%	61.8%	4.6%	1.3%																			15.1%
AA-	702	1.3%	4.1%	18.2%	50.7%	3.7%	2.3%	0.6%	0.1%							0.1%									18.8%
A+	467	0.2%	0.9%	4.9%	17.3%	52.9%	2.1%	2.4%	1.7%			0.2%												0.2%	17.1%
A	335		1.2%	3.0%	6.9%	13.7%	50.4%	5.1%	2.1%	0.9%															16.7%
A-	239			0.4%	3.3%	7.5%	12.6%	48.5%	5.9%	0.8%	0.8%	0.8%						0.4%				0.4%			18.4%
BBB+	177		0.6%		1.1%	3.4%	7.3%	22.6%	32.2%	10.7%	2.3%	1.1%												1.7%	16.9%
BBB	154						4.5%	4.5%	9.7%	45.5%	8.4%	2.6%	0.6%	1.3%											22.7%
BBB-	141				0.7%		0.7%	4.3%	5.0%	9.9%	54.6%	6.4%	1.4%	1.4%										0.7%	14.9%
BB+	61									3.3%	18.0%	39.3%	4.9%	1.6%									1.6%	1.6%	29.5%
BB	43									2.3%	9.3%	2.3%	39.5%	7.0%			2.3%		4.7%				2.3%	7.0%	23.3%
BB-	28						3.6%					7.1%	10.7%	28.6%	3.6%	7.1%	3.6%		7.1%				7.1%	7.1%	14.3%
B+	14											7.1%		7.1%	42.9%	7.1%								14.3%	21.4%
B	17										5.9%		11.8%		11.8%	41.2%									29.4%
B-	11																36.4%		27.3%					9.1%	27.3%
CCC+																									
CCC																									
CCC-																									
CC	12																				16.7%	33.3%	50.0%		
C	3																					33.3%	33.3%		33.3%
TOTAL	3954																								

### E(ii) U.S. Public Finance - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2008 - 12/31/2018 (%)				
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	264	55.3%	4.9%	1.9%	1.1%	0.8%																		0.4%	35.6%	
AA+	232	36.6%	28.0%	3.0%	1.7%																				30.6%	
AA	513	8.0%	32.6%	16.6%	4.3%	1.8%	0.6%	1.2%	0.2%	0.2%	0.2%		0.2%		0.2%								0.2%	0.2%	33.7%	
AA-	538	2.2%	11.3%	26.4%	15.4%	7.4%	3.9%	0.7%		0.2%	0.2%	0.2%											0.2%		31.8%	
A+	727	1.0%	2.8%	12.9%	17.7%	10.6%	3.4%	1.9%	0.8%		0.4%			0.1%									0.1%		48.1%	
A	495		2.4%	6.5%	14.9%	13.7%	10.9%	4.2%	1.4%	2.4%	0.4%		0.4%			0.2%	0.2%				0.2%		0.2%	0.2%	41.6%	
A-	328	0.3%	1.5%	3.0%	7.3%	8.8%	12.2%	12.2%	2.4%	2.4%	1.2%	0.6%	0.6%										0.6%	0.3%	46.3%	
BBB+	171		0.6%	1.8%	5.3%	5.8%	6.4%	16.4%	5.8%	3.5%	1.2%	1.2%	0.6%		0.6%				0.6%				1.8%		48.5%	
BBB	172	0.6%	0.6%		2.9%	3.5%	4.7%	2.9%	2.9%	5.2%	2.3%	3.5%	0.6%	0.6%	0.6%	0.6%			1.7%				3.5%	2.9%	60.5%	
BBB-	121					3.3%	0.8%	3.3%	6.6%	3.3%	8.3%	4.1%	3.3%	2.5%	0.8%			0.8%				2.5%	4.1%	3.3%	52.9%	
BB+	27							3.7%			7.4%	7.4%	3.7%										7.4%		66.7%	
BB	26										3.8%				3.8%	3.8%							3.8%	3.8%	76.9%	
BB-	10												10.0%										10.0%		80.0%	
B+	5																								100.0%	
B	10							20.0%						10.0%									10.0%		60.0%	
B-	4																							25.0%	75.0%	
CCC+																										
CCC	5														20.0%								20.0%		60.0%	
CCC-																										
CC	4																						75.0%		25.0%	
C	1																								100.0%	
TOTAL	3653																									

E(iii) International Public Finance - 1-Year Transition and Default Rates

(December 31, 2017 through December 31, 2018)

Credit Ratings as of 12/31/2017		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2017 - 12/31/2018 (%)			
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+	1		100.0%																						
AA	34			91.2%	5.9%	2.9%																			
AA-	22				86.4%																			13.6%	
A+	19					89.5%	5.3%																	5.3%	
A	33					15.2%	84.8%																		
A-	39						2.6%	94.9%	2.6%																
BBB+	40							22.5%	72.5%	5.0%															
BBB	62								4.8%	85.5%	6.5%													3.2%	
BBB-	48									2.1%	81.3%	14.6%												2.1%	
BB+	35										5.7%	51.4%	20.0%	14.3%	2.9%									5.7%	
BB	25											4.0%	44.0%	32.0%										20.0%	
BB-	14													50.0%										50.0%	
B+	11														45.5%	9.1%								45.5%	
B	14															92.9%								7.1%	
B-	3																100.0%								
CCC+																									
CCC	1																								
CCC-																									
CC																									
C	1																					100.0%			
TOTAL	426																								

### E(iii) International Public Finance - 3-Year Transition and Default Rates

(December 31, 2015 through December 31, 2018)

Credit Ratings as of 12/31/2015		Credit ratings as of 12/31/2018 (%)																				Other Outcomes During 12/31/2015 - 12/31/2018 (%)			
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	100.0%																							
AA+	5		20.0%	80.0%																					
AA	33			75.8%	9.1%	3.0%																		12.1%	
AA-	17				94.1%																			5.9%	
A+	13					76.9%	7.7%																	15.4%	
A	21					28.6%	47.6%	19.0%																4.8%	
A-	17							70.6%	23.5%															5.9%	
BBB+	30							30.0%	20.0%	43.3%	3.3%													3.3%	
BBB	32							6.3%	21.9%	46.9%	9.4%													15.6%	
BBB-	33								3.0%	9.1%	63.6%	6.1%	6.1%	3.0%										9.1%	
BB+	19									5.3%	5.3%	31.6%	10.5%	31.6%										15.8%	
BB	21											9.5%	23.8%	14.3%										52.4%	
BB-	12													16.7%	25.0%							8.3%		50.0%	
B+	7															14.3%								85.7%	
B																									
B-																									
CCC+																									
CCC	6															50.0%	33.3%							16.7%	
CCC-																									
CC																									
C	1																						100.0%		
TOTAL	289																								

### E(iii) International Public Finance - 10-Year Transition and Default Rates

(December 31, 2008 through December 31, 2018)

Credit Ratings as of 12/31/2008		Credit ratings as of 12/31/2018 (%)																					Other Outcomes During 12/31/2008 - 12/31/2018 (%)		
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	40	15.0%		25.0%		7.5%		12.5%																	40.0%
AA+	13			38.5%	15.4%	7.7%		7.7%	7.7%																23.1%
AA	25		4.0%	4.0%	8.0%	4.0%		4.0%	4.0%	12.0%	12.0%														48.0%
AA-	33			3.0%	9.1%			3.0%	3.0%	9.1%	3.0%														69.7%
A+	16				6.3%		6.3%		6.3%	18.8%			6.3%												56.3%
A	13									15.4%		7.7%	7.7%												69.2%
A-	10							40.0%		10.0%															50.0%
BBB+	6							33.3%	16.7%		33.3%														16.7%
BBB	7							28.6%	14.3%	14.3%	14.3%														28.6%
BBB-	9									11.1%	55.6%	11.1%													22.2%
BB+	9									11.1%	22.2%														66.7%
BB	9										22.2%	11.1%													66.7%
BB-	13											7.7%	23.1%	7.7%	7.7%										53.8%
B+	6												16.7%				16.7%						16.7%		50.0%
B	2															50.0%									50.0%
B-																									
CCC+																									
CCC																									
CCC-																									
CC																									
C																									
TOTAL	211																								

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 Primary 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 taking into account 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 Rating Action Commentary 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 Issuer Default Ratings (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.**

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:

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

- a. an uncured payment default or distressed debt exchange on a bond, loan or other material financial obligation, but
- b. has not entered into bankruptcy filings, administration, receivership, liquidation, or other formal winding-up procedure, and
- c. has not otherwise ceased operating.

This would include:

- i. the selective payment default on a specific class or currency of debt;
- ii. 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;
- iii. 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.

## 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.**

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:

- a. Failure to make payment of principal and/or interest under the contractual terms of the rated obligation;
- b. bankruptcy filings, administration, receivership, liquidation or other winding-up or cessation of the business of an issuer/obligor; or
- c. 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. 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 in Corporate and Public Finance**

For the agency's corporate and public finance ratings, issuers may often carry both Long-Term and Short-Term Ratings. These may be assigned to the issuer, to its obligations, or to both. While there are a large number of discrete factors that drive Short-Term Ratings, a linkage has typically existed between Short-Term and Long-Term Ratings. In part, this reflects the inherent importance of liquidity and near-term concerns within the assessment of the longer-term credit profile. Additionally, it ensures that the two scales do not intuitively contradict each other for a given issuer. This linkage is outlined below, and in most circumstances displays a certain asymmetry, namely:

- a. Higher relative short-term default risk implies an elevated risk of default in the near-term that cannot be separated from the long-term default assessment for most instruments and issuers; but

- b. lower relative short-term default risk, perhaps through factors that lend the issuer's profile temporary support, may coexist with higher medium- or longer- term default risk.

The Rating Correspondence Table thus represents a "common-sense" check on the combination of a particularly weak Short-Term Rating with a high Long-Term Rating. The other asymmetry — stronger Short-Term Rating but weaker Long-Term Rating — is addressed conceptually. The Short-Term Rating within investment grade is a measure of intrinsic or sustainable liquidity, which in most cases excludes the kind of temporary or unsustainable support described in point b. above.

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
A–	F2 or F1
BBB+	F2
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/site/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/site/ratings-history-disclosure>.