PCR: Transition / Default Matrix – December 2016

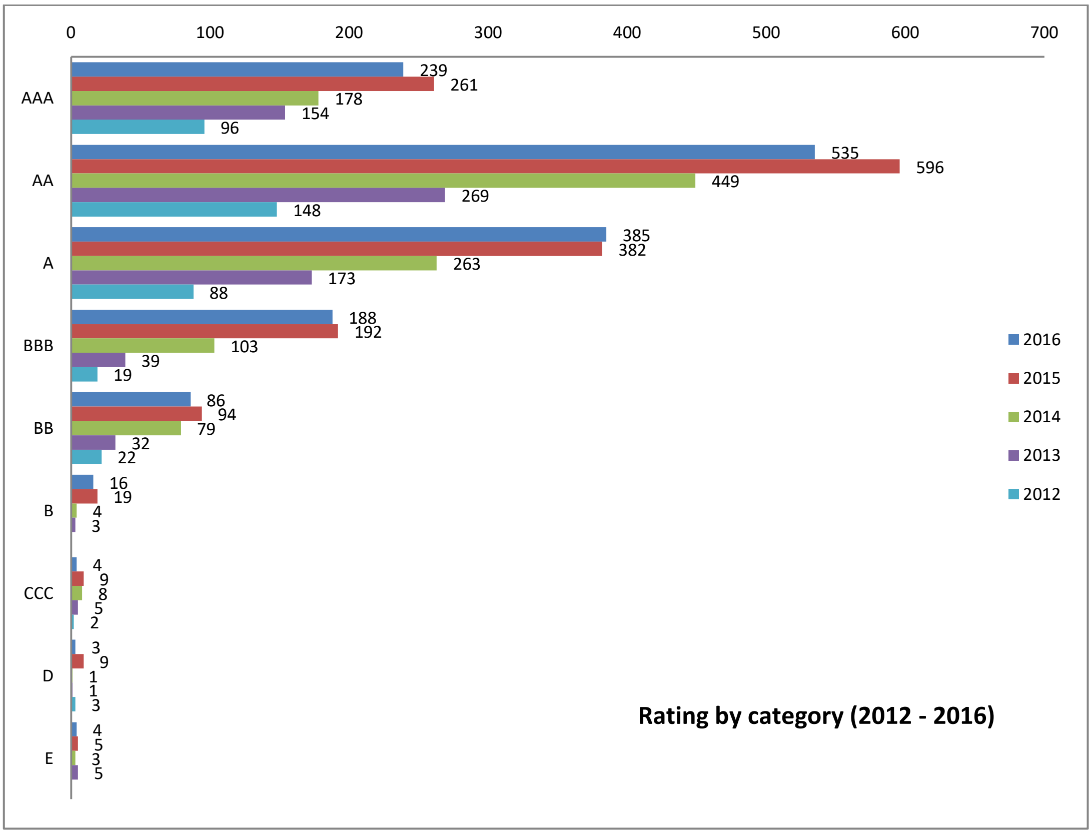
Transition / Default Matrix (also referred to as "credit migration matrices") are a key tool for the analysis of credit risk. In the regulatory field, the new Basel agreement requires capital estimations in accordance with rating migration behavior. Concerning investments, these matrices enable the comparison and forecast of the level of exposure to losses caused by default and devaluation due to credit spread movements. Consequently, they are cardinal inputs for financial applications such as portfolio risk management or the valuation of bonds and derivatives.

Pacific Credit Rating (PCR) prepares periodically the transition / default matrix using ratings assigned by all subsidiaries and strategic partners[1]. The following summary will show the main findings of the assessment and analysis made with the transition / default matrices worked.

In Latin America and Caribbean, the growth decline reflects to an important extent more muted expectations of short-term recovery. These economies not only had a weak growth, they also see a period of low price for metals, especially in the first quarter and heavy currency depreciations[2].

In this scenario, in 2016 the total number of issuers rated by PCR was to 418. Companies rated by PCR have reached stable ratings[3]. In addition, 92.26% of PCR securities were rated with a higher rating (AAA, AA, A, BBB), this performance has been slightly bigger than that of 2015 with 91.32%. On the contrary, during the last whole year, PCR rated on default[4] (D) three companies, 6 less than defaulted firms of the previous year. On the immediately following ratings (C and CC), there were two firms, less different from the three found in 2015 (See the following table).

[1] Pacific Credit Rating (PCR) has subsidiaries in Bolivia, Peru, Ecuador, Panama, Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala and Mexico as a strategic partner.
[2] International Monetary Fund, World Economic Outlook Update, January 16, 2017.
[3] See annex 3 for transition / default matrices worked by PCR.
[4] The condition by which PCR classifies obligors, securities, or money market instruments as being in default is when the company has lost its capacity to accomplish with its contractual obligations.



Source: PCR

Concerning the ratio of downgrades to upgrades that shows the performance of the rating, 2.83% of ratings were upgrades during 2016, a smaller portion than 2015 (3.23%). On the other hand, the downgrades represented 0.25% and 1.83% on 2016 and 2015, respectively.

Then, if we take in count transitions for the whole period of information under analysis (1990 – 2016) and compare with the information aggregated until 2015, it is seem that 3.03% of ratings were upgrades until 2016, a small extent compared to the 3.11% until 2015. Likewise, downgrades were smaller with 1.72% and 2.30% until 2016 and 2015, respectively.

In order to have a reference, during the closer years of real state financial crisis of United States (2007 and 2009) the ratio of downgrades were duplicated (from 9.3% in 2007 to 19.18% in 2009)[5] and the upgrades fall significantly on a third (from 13.47% in 2007 to 4.81% in 2009).

By demonstrating a positive relationship between the quality and stability of the credit ratings, the transition rates portray the stability of each PCR credit rating category.

[5] This information were found on the Standard & Poor's report "Default, Transition, and Recovery: 2014 Annual Global Corporate Default Study and Rating Transitions".

Transition default rates provide for one-, three- and ten-year time horizons. In terms of rating actions, as expected, higher-rated credits ("BBB" and higher rating categories) are subject to fewer rating changes compared with lower grades (non-investment grade).

The one-, three- and ten-year rates presented in the following tables:

Transition / Default Matrix [6]

PCR Aggregate - 1-Year Transition and Default Rates

(December 31, 2015 through December 31, 2016)

Credit Ratings as of 12/31/2015		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2015-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	239	90%									10%
AA	535	3%	91%	1%							6%
A	385			96%							4%
BBB	188			4%	86%						10%
BB	86				16%	79%					5%
B	4						100%				
CCC	4							100%			
Total	1441										

Source: PCR

PCR Aggregate - 3-Year Transition and Default Rates

(December 31, 2013 through December 31, 2016)

Credit Ratings as of 12/31/2013		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2013-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	678	81%	1%		1%	1%					13%
AA	1580	1%	90%	1%							7%
A	1030		3%	84%	1%						10%
BBB	483			4%	84%	1%					11%
BB	259				8%	78%	1%		1%		12%
B	39				5%	4%	17%		4%		62%
CCC	21						9%	67%			20%
Total	4090										

Source: PCR

PCR Aggregate - 10-Year Transition and Default Rates

(December 31, 2006 through December 31, 2016)

Credit Ratings as of 12/31/2006		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2006-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	990	69%	1%		1%	1%				5%	22%
AA	2057	1%	85%	1%						1%	11%
A	1344		3%	75%	1%	1%				2%	18%
BBB	565			3%	74%	2%				1%	21%
BB	346				6%	62%			1%		30%
B	56				4%	3%	7%		2%	5%	78%
CCC	30				1%	1%	5%	66%		4%	23%
Total	5388										

Source: PCR

Overall, it is relevant to remark that companies rated by PCR keep on credit quality stable for the year 2016. PCR will stay watching closely credit risk by the study of transition / default matrix.

[6] The transition matrix was developed using the cohort method with quarterly transition information. The 4th powered were used to annualize the matrices.

Bibliography and References

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- PCR: Credit Transition Matrices – December 2015
- Standard & Poor's: Default, Transition, and Recovery - 2014 Annual Global Corporate Default Study And Rating Transitions
- PCR Transition rating matrix (cohort method) model - excel
- RISKO http://www.risk-o.com/
- Rating categories and definitions: http://www.ratingspcr.com/uploads/2/5/8/5/25856651/pcr-met-p-500_2017.pdf

Annex 1: Rating scales

As part of the process, we identified the following nine specific rating scales employed by PCR. It noted that as part of the PCR methodology, some ratings could be qualified (accompanied by signs "+" or "-"). In addition, each scale contains a notch corresponding to Not-Rated ("NR").

Table 2: Specific rating scales assumed for the analysis			
N°	Scale	Notches	Code
1	Short-term corporate debt issues	8	CP
2	Short-term deposits at financial system entities	6	CPF
3	Medium and long term deposits at financial system entities	19	DSF
4	Medium- and long-term corporate debt issues and preferred shares	20	LP
5	Common shares	6	AC
6	Mutual funds	18	FM
7	Insurance companies debt (CPA)	19	CPA
8	Financial Strength of Banks and insurance companies	23	FF
9	Securitizations (Asset back securities)	22	TI

Source: PCR

An exercise of unification of the ratings scales between countries was conducted, so that the statistics could be compatible and integrated into the desired transition and default matrix.

The qualified notches used on each scale presented below.

- Short-term corporate debt issues: 1+; 1; 1-; 2; 3; 4; 5; NR
- Short-term deposits at financial system entities: I; II; III; IV; V; NR
- Medium and long term deposits at financial system entities: AAA; AA+; AA; AA-; A+; A; A-; BBB+; BBB; BBB-; BB+; BB; BB-; B+; B; B-; CCC; DD; NR
- Medium- and long-term corporate debt issues and preferred shares: AAA; AA+; AA; AA-; A+; A; A-; BBB+; BBB; BBB-; BB+; BB; BB-; B+; B; B-; CCC; DD; D; NR
- Common shares: N1; N2; N3; N4; N5; NR
- Mutual funds: AAAf; AAf+; AAf; AAf-; Af+; Af; Af-; BBBf+; BBBf; BBBf-; BBf+; BBf; BBf-; Bf+; Bf; Bf-; CCCf; NR
- Insurance companies debt (CPA): AAA; AA+; AA; AA-; A+; A; A-; BBB+; BBB; BBB-; BB+; BB; BB-; B+; B; B-; CCC; DD; NR
- Financial Strength of Banks and insurance companies: AAA; AA+; AA; AA-; A+; A; A-; BBB+; BBB; BBB-; BB+; BB; BB-; B+; B; B-; CCC; C+; C; DD; D; E; NR
- Securitizations (Asset back securities): AAA; AA+; AA; AA-; A+; A; A-; BBB+;

BBB; BBB-; BB+; BB; BB-; B+; B; B-; CCC; C+; C; DD; D; NR

Rating scale and specific matrices assumed for the analysis

The following unified scale used for transition matrix: AAA, AA, A, BBB, BB, B, CCC, C, DD and NR.

Five specific transition and default matrix produced for the following types of issuers or securities (see annex 3):

1. Financial Institutions, brokers and dealers
2. Insurance Companies
3. Corporate debt Issues of medium and long term debt and Preferred Stock
4. Asset Backed Securities
5. Sovereign Issuers
6. Public Finance

Annex 2: Other assumptions and methodological aspects

a) The treatment of the Default case (D) and the Not-Rated case (NR)

In all of the ratings scales, there are two special categories: the "D" rating, which stands for the default condition and the "NR" rating, standing for "not rated". The final form of the matrix depends on the ways in which these categories are processed as part of the analysis.

The "D" category will be treated like any other notch on credit ratings scale. This is an informational value, because it allows the identification of the proportion of securities or companies that migrated to the default condition. However, the "NR" value is often considered in the literature as a non-informative condition, since it is not possible to know with certainty what is the source or reason for the ratings moving to this category.

The two practical approaches to deal with the case of "NR" are as follows:

- To exclude the "NR" category. This requires distributing the probabilities from the "NR" column in the matrix between all elements of each row in proportion to their values. This is achieved by progressively eliminating the companies in the sample whose ratings are entering this category. Although, such a procedure effectively removes the "NR" column from the matrix, it affects the value of the rest of the probabilities.
- To include the "NR" category. This method maintains and presents information about the proportion of cases that migrated to condition "NR", so that they may be subject to further analysis and keep untouched the rest of the values in the matrix.

We will adopt both approaches separately in the following analysis.

b) Point estimate (point-in-time) versus estimation through the cycle (through-the-cycle)

In the estimation of a transition matrix, one can usually distinguish two kinds of procedures according to the size of the data sample used.

If the sample only corresponds to the most recent observations then it is categorized as a point estimate (point-in-time). This kind of statistical measure is not affected by prior events, but is strongly affected by the short-term trends. In other words, does not allow for capturing of the value of medium term trends of transition probabilities. If the estimation is done with a wide sample, covering a series of stages of the economic cycle, it qualifies as an estimate done through the cycle (through-the-cycle).

Four different samples will be used as part of this project, one point-in-time and three through-the-cycles:

- Two one-year samples (2016 and 2014)
- A three-years sample ending in 2016 (2014-2016)
- A ten-years sample ending in 2016 (2007-2016)
- The whole database sample (spanning 26 years from 1990 to 2016)

c) Ratings mapping for the Financial Strength of Banks and Insurance Companies in Peru

The following mapping procedure was used for the historical ratings of the financial strength of banks and insurance companies in Peru.

Table 3: Ratings Mapping Financial Strength Of Banks And Insurance Companies In Peru		
N°	Original rating	Equivalent rating
1	A+	AAA
2	A	AA
3	A-	A
4	B	BBB
5	C	BB
6	D	B
7	E	C
8	E	D
9	E	E

Source: PCR

d) Other assumptions and adjustments

In addition to the aforementioned procedures, the following assumptions and adjustments were adopted:

1. Country prefixes were removed from ratings.
2. Rating outlooks were not taken into account.
3. For those rating dates which were given as intervals (e.g. "first half of 2001"), the median date for the time interval was assumed.
4. Rating cancellation dates posterior to the maturity of the security were adjusted.

For securities which had an ending date ("termination of classification"), it was assumed that a transition to the "NR" rating occurred on that date.

Annex 3: Transition matrices

a) For one year (2016)

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

(December 31, 2015 through December 31, 2016)

Credit Ratings as of 12/31/2015		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2015-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	35	**89%**									**11%**
AA	119	**12%**	**81%**								**7%**
A	135			**97%**							**3%**
BBB	87			**4%**	**83%**						**13%**
BB	50				**7%**	0%	**88%**				**4%**
B	13				**7%**		0%	**88%**			**4%**
CCC	3							0%			
Total	442										

Insurance companies -1 Year Transition and Default Rates

(December 31, 2015 through December 31, 2016)

Credit Ratings as of 12/31/2015		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2015-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	7	**100%**									
AA	51		**92%**	**7%**							
A	45			**91%**							**9%**
BBB	30				**100%**						
BB	18				**20%**	**80%**					
B	0						0%				
CCC	0										
Total	151										

Corporate Issues - 1 Year Transition and Default Rates

(December 31, 2015 through December 31, 2016)

Credit Ratings as of 12/31/2015		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2015-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	50	**85%**									**15%**
AA	271		**93%**								**7%**
A	128			**100%**							
BBB	29			**12%**	**65%**						**24%**
BB	4			**4.0%**	**56%**	**32%**					**8%**
B	0						0%				
CCC	1							**100%**			
Total	483										

Asset Backed Securities -1 Year Transition and Default Rates

(December 31, 2015 through December 31, 2016)

Credit Ratings as of 12/31/2015		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2015-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	144	**92%**									**8%**
AA	94		**96%**								**4%**
A	61			**88%**							**12%**
BBB	9				**100%**						
BB	0					0%					
B	0						0%				
CCC	3							**100%**			
Total	311										

Public Finance -1 Year Transition and Default Rates

(December 31, 2015 through December 31, 2016)

Credit Ratings as of 12/31/2015		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2015-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	3	**100%**									
AA	0		0%								
A	12			**100%**							
BBB	33				**100%**						
BB	14					**100%**					
B	3						**100%**				
CCC	0										
Total	65										

b) For three years (2013-2016)

Financial Institutions, Brokers and Dealers -3 Years Transition and Default Rates

(December 31, 2013 through December 31, 2016)

Credit Ratings as of 12/31/2013		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2013-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	88	**91%**									**9%**
AA	365	**4%**	**83%**	**2%**							**11%**
A	384		**4%**	**83%**	**1%**						**12%**
BBB	243			**6%**	**78%**	**1%**					**15%**
BB	174				**7%**	**73%**	**2%**				**17%**
B	24						**59%**		**10%**		**32%**
CCC	9						**25%**	**37%**	**2%**		**36%**
Total	1287										

Insurance companies -3 Years Transition and Default Rates

(December 31, 2013 through December 31, 2016)

Credit Ratings as of 12/31/2013		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2013-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	18	**100%**									
AA	164		**93%**	**2%**	**2%**						**3%**
A	142		**8%**	**87%**	**2%**						**4%**
BBB	71				**96%**						**4%**
BB	34				**11%**	**89%**					
B	0						0%				
CCC	0							0%			
Total	429										

Corporate Issues - 3 Years Transition and Default Rates

(December 31, 2013 through December 31, 2016)

Credit Ratings as of 12/31/2013		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2013-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	148	**92%**								**3%**	**5%**
AA	770	**0%**	**95%**	**1%**						**1%**	**4%**
A	291		**1%**	**96%**	**1%**					**1%**	
BBB	73			**5%**	**80%**					**5%**	**10%**
BB	12			**0.6%**	**27%**	**71%**				**1%**	**1%**
B	0						0%				
CCC	1							**100%**			
Total	1295										

Asset Backed Securities -3 Years Transition and Default Rates

(December 31, 2013 through December 31, 2016)

Credit Ratings as of 12/31/2013		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2013-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	413	**75%**	**1%**					**11%**		**11%**	**3%**
AA	280		**86%**					**6%**		**6%**	**1%**
A	174			**65%**	**2%**			**16%**		**14%**	**4%**
BBB	14				**100%**						
BB	0					0%					
B	11						0%	**100%**			
CCC	11									**100%**	
Total	903										

Public Finance -3 Years Transition and Default Rates

(December 31, 2013 through December 31, 2016)

Credit Ratings as of 12/31/2013		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2013-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	11	**100%**									
AA	34		0%	**100%**							
A	82			0%	**95%**	**5%**					
BBB	0				0%						
BB	39					**90%**	**4%**		**6%**		
B	4						**100%**				
CCC	0										
Total	170										

c) **For ten years (2006-2016)**

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

(December 31, 2006 through December 31, 2016)

Credit Ratings as of 12/31/2006		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2006-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	152	**74%**	**2%**							**1%**	**22%**
AA	480	**3%**	**75%**	**1%**						**1%**	**20%**
A	562		**3%**	**72%**	**1%**	**1%**					**24%**
BBB	292			**4%**	**66%**	**2%**					**28%**
BB	247				**6%**	**55%**	**1%**				**38%**
B	29						**40%**		**7%**		**54%**
CCC	10						**20%**	**41%**	**1%**		**38%**
Total	1772										

Insurance companies -10 Years Transition and Default Rates

(December 31, 2006 through December 31, 2016)

Credit Ratings as of 12/31/2006		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2006-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	35	**62%**	**19%**		**7%**						**13%**
AA	223		**93%**	**2%**	**2%**						**4%**
A	197		**9%**	**81%**	**3%**						**7%**
BBB	79				**93%**						**7%**
BB	43				**11%**	**83%**					**6%**
B	0						0%				
CCC	0							0%			
Total	577										

Corporate Issues - 10 Years Transition and Default Rates

(December 31, 2006 through December 31, 2016)

Credit Ratings as of 12/31/2006		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2006-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	234	**78%**								**17%**	**5%**
AA	1005		**91%**	**1%**						**4%**	**4%**
A	334		**1%**	**93%**	**1%**					**4%**	**1%**
BBB	86			**4%**	**83%**					**4%**	**9%**
BB	15				**22%**	**76%**					**1%**
B	0						0%				
CCC	3							**20%**		**80%**	
Total	1677										

Asset Backed Securities -10 Years Transition and Default Rates

(December 31, 2006 through December 31, 2016)

Credit Ratings as of 12/31/2006		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2006-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	557	**64%**	**1%**							**34%**	**2%**
AA	348		**80%**							**18%**	**2%**
A	206		**1%**	**55%**	**2%**					**39%**	**3%**
BBB	14				**100%**						
BB	0					0%					
B	20						0%			**100%**	
CCC	17							**100%**			
Total	1162										

Sovereign issuers -10 Years Transition and Default Rates

(December 31, 2006 through December 31, 2016)

Credit Ratings as of 12/31/2006		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2006-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	0	0%									
AA	0		0%								
A	4			**6%**						**94%**	
BBB	8				0%					**100%**	
BB	2					**6%**				**94%**	
B	3						**1%**			**99%**	
CCC	0							0%			
Total	17										

Public Finance -10 Years Transition and Default Rates

(December 31, 2006 through December 31, 2016)

Credit Ratings as of 12/31/2006		Credit Ratings as of 12/31/2016 (Percent)							Other Outcomes During 12/31/2006-12/31/2016 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	12	**100%**									
AA	0		0%								
A	36			**100%**							
BBB	86				**95%**	**4%**					
BB	39					**90%**	**4%**		**6%**		
B	4						**100%**				
CCC	0										
Total	177										