PCR | PACIFIC CREDIT RATING

"Prestigio, calidad y respuesta ágil"

Annual Report of Transitions of Risk Ratings and Default, 2018

Abstract

Financial markets had volatile behavior, stock market indexes and invesment confidence have diclined, due to trade friction between the United States of America and China. In emerging markets, global trend has adverse effects on investment flows, so regulators have oriented their economic policies to cope with the cycle. The Latin American region is facing global changes with mixed results, sovereign debt crises in contrast to positive growth in the region.

Through the analysis of transitions of risk ratings, PCR distinguishes that rated financial securities and issuers have credit stability. On the other hand, the cases in which a non-payment of obligations were incurred are not related to the development of the Latin American financial market. However, the probability of default respect to the previous report has increased, especially in corporate debt securities.

Introduction

The study and analysis of the transitions of ratings are decisive for the administration of credit risk, an essential component in the framework of the Basel regulatory agreements. Also, monitoring the evolution of the assigned ratings allows comparisons and forecasts of level of exposure to losses because of default.

Pacific Credit Rating (PCR) periodically develops transition/default matrices based on all ratings granted by all of the company's subsidiaries and strategic partners. Then, the main findings are summarized as a result of analysis of the results of the transition/default matrix obtained until 2018.

Content

Analysis Direction
Paúl Caro
(511) 208-2530 Annex 2217
Analysis Director
pcaro@ratingspcr.com

Methodologies Department
Jorge Enriquez Almonte
(511) 208-2530 Annex 2225
Chief of Methodology
jenriquez@ratingspcr.com
Mario Flores Taico
(511) 208-2530 Annex 2210
Methodology Analyst
mflores@ratingspcr.com
Irving Paredes Reducindo
(511) 208-2530
Financial Models Assistant
iparedes@ratingspcr.com

Global Financial Context

A decade after the international financial crisis (2008-2009), it is estimated that global economic growth was 3.1%, with stable trend, compensated figure between the largest fiscal expansion in the United States of America and discouragement for other countries (Argentina, Canada, China and Japan).

Financial markets have been marked by frecuently episodes of volatility caused by trade disputes between the USA and China. On this, uncertainty is added in the decisions of world economic policy, instability in oil prices, downward trend in minerals (-10.8%) and world trade volumes (-1.5%). According to Moody's Analytics Survey of Business Confidence, global investment prospects have taken conservative positions after the Fed increases its interest rate faster than anticipated by the market.

Stock indexes of the main global stock exchanges accumulated losses at the end of the year 2018, Dow Jones fell 5.63%, S&P 500 fell by 6.24%, Nasdaq Composite lost 3.88%, Nasdaq 100 fell by 1%, and Nikkei 225 decreased by 12.08%. Similar situation experienced indexes of emerging markets such as MSCI Emerging Markets which decreased 14.57%. The energy sector had the worst performance in 2018, experiencing a -20.5% decline in its S&P 500 index due to the reduction in oil production and the sanctions of the US government to Iran.

The level of long-term debt with high returns and leverage have duplicated since the global financial crisis due to the flexibilization of the financial market which suggests the expansion of risk appetite. Speculative grade securities doubled in the United States and Europe. The exposure to a possible economic prescription that induces a significant increase in credit risk is greater.

In the emerging economies, the flow of short-term investments and demand for assets were reduced, both explained by changes in interest rates worldwide, upward pressures on the exchange rate, mismatches of foreign currency liabilities, internal political conflicts, inflationary pressures and fiscal imbalance (Argentina, Brazil and Venezuela).

A large part of the Latin American region remained stable but with a slight deceleration, obtaining a growth of 1.2% (-2%) at the end of 2018. However, the dispersion gap between growth rates has increased. Likewise, most of the inflation rates of the countries in the region remained within the target range.

Ratings Transition in 2018

The securities rated by PCR in 2018 were 1724 of which 92.05% are in investment grade which indicates an improvement in the credit stability of the issuers with respect to the previous year (+ 186 bp). The sector with the greatest credit stability, based on its ratings, is that of corporations (47.31%) followed by financial institutions (33.54%).

The probability that qualified securities will fall in default for 2018 was 14.75%, which represents an increase compared to 2017 (+ 390 bp). Thus, during the last year PCR has rated 2 values in default (Bolivia and Mexico), with 4 notches being the most severe downgrade with respect to the beginning of the year (BBB - D). Both defaults respond to illiquidity and over-indebtedness factors not related to the financial trend of the markets.

The number of upgrades in 2018 amounted to 16, higher than the 10 rating increases of 2017. Also, the number of securities that raised their rating to the investment grade (4) increased respect to the previous year (3). On the other hand, the number of downgrades in 2018 rose to 10 (+ 25%) among which, 3 securities fell to the speculative degree (+ 25%).

With regard to the reduction and increase rate shown by the performance of the ratings, 1.43% of the total number of credit ratings in the circulation increased during 2018, the smallest portion compared to 2017 (2.90%). On the other hand, the rating reductions represented 1.15% and 0.27% in 2018 and 2017, respectively.

Credit Ratings as of 12/31/2017		Credit Ratings as of 12/31/2018 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Total Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	151	**84%**	**1%**							**9%**	**6%**
AA	456		**85%**	**3%**	**1%**					**6%**	**5%**
A	518		**1%**	**87%**	**1%**					**6%**	**5%**
BBB	462		**1%**	**7%**	**84%**	**2%**				**2%**	**4%**
BB	93				**14%**	**73%**					**12%**
B	36						**89%**				**11%**
CCC	8							**59%**	**15%**		**27%**
Total	1724										

Ratings Transition between 2008 - 2018

The evolution of the risk ratings between 2008 - 2018 that PCR assigned was concentrated in the corporate sector (44.52%) and financial institutions (39.19%). The ratings assigned at the beginning of the period have remained stable, until their revision, with a tendency to upgrade; this due to the investment flows that entry to the emerging countries in the context of the international financial crisis and the effective countercyclical measures of economic policy that the Latin American region notoriously sustained. Likewise, the sovereign ratings of Ecuador and El Salvador have improved towards the end of the period. This is explained by improvements in the service of external debt through refinancing policies.

The ratings "AAA", "AA" and "A" have been the most likely to be maintained throughout the period with 97.2%, 96.8% and 96.18% probability respectively. Similarly, the ratings issued in the period, the number of upgrades was 48 of the records, 24% correspond to investment grade notes. On the other hand, the reductions were 31 in which 58.1% were below the investment grade.

The probability of default was 10%, a stable figure compared to the 2007-2017 period. This result is not related to the development of financial markets.

Credit Ratings as of 12/31/2008		Credit Ratings as of 12/31/2018 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Total Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	597	**89%**	**1%**							**3%**	**8%**
AA	1805	**1%**	**88%**	**1%**						**5%**	**5%**
A	1431		**3%**	**86%**	**1%**					**5%**	**5%**
BBB	1091			**5%**	**83%**	**3%**				**3%**	**5%**
BB	347		**1%**		**7%**	**83%**	**2%**	**1%**	**1%**		**4%**
B	168					**4%**	**81%**	**3%**			**12%**
CCC	50							**78%**	**9%**	**6%**	**7%**
Total	5489										

Transitions by economic sector

▪ Financial institutions

The qualified securities of the financial institutions in 2018 amounted to 658 among which 87.88% are in investment grade being the "AAA", "AA" and "A" ratings the most stable ratings with 100% ratification probabilities, 99.39% and 98.03% respectively. Consistent with global environment in which they perceive positive expectations. The upgrades (8) were higher than the downgrades (5), a similar proportion to number of ratings that went up to investment grade (4) compared to those that went down to speculation (2). Also the probability of default was 1%.

Credit Ratings as of 12/31/2017		Credit Ratings as of 12/31/2018 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	96	**100%**									
AA	163		**98%**		**2%**						
A	152			**92%**	**2%**						**5%**
BBB	169		**2%**	**6%**	**79%**	**3%**			**1%**		**8%**
BB	48			**0.8%**	**24%**	**54%**					**21%**
B	24						**84%**				**16%**
CCC	6							**100%**			
Total	658										

Insurers

The ratings granted in 2018 (136) were found in investment grade being the most frequent "A" (33.82%). This is consistent with average growth of the sector in the region (2.4%) estimated by the Association of Insurance Supervisors of America and the expansion of gross premiums globally. The number of rebates was the same as upgrades (2), both changes within the investment grade.

Credit Ratings as of 12/31/2017		Credit Ratings as of 12/31/2018 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	9	**100%**									
AA	42		**100%**								
A	46			**84%**	**8%**						**8%**
BBB	39			**9%**	**90%**						
BB	0					0%					
B	0						0%				
CCC	0										
Total	136										

Corporations

For corporate sector, 827 securities were rated by PCR whose most frequent califications were "A" (36.64%) and "AA" (29.87%) whose ratification probabilities were 97.03% and 91.90% respectively. Likewise, the sector has a probability of default of 15%, much higher than other sectors due by the volatility of the sector at a global level and unstable trends in the price/production of commodities and strongly related to the global economic slowdown. The number of upgrades for the year was 5, equal to the number of downgrades.

Credit Ratings as of 12/31/2017		Credit Ratings as of 12/31/2018 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	46	**69%**								**15%**	**15%**
AA	247		**71%**	**5%**						**10%**	**13%**
A	303		**1%**	**89%**						**5%**	**5%**
BBB	222			**10%**	**88%**	**2%**					
BB	7					**100%**					
B	0						0%				
CCC	2							**6%**	**15%**	**79%**	
Total	827										

Asset-backed securities

The ratings issued instruments were 382, in which all were in investment grade. Among these, the highest probabilities of ratification were the ratings "AAA" (95.45%) and "AA" (100%), a sign of great stability and with projections for greater investment financing from the microfinance and mortgage side globally. There was only 1 downgrade of a notch and that maintains the investment grade rating.

Credit Ratings as of 12/31/2017		Credit Ratings as of 12/31/2018 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	153	**83%**	**6%**								**11%**
AA	90		**100%**								
A	123			**80%**						**17%**	**3%**
BBB	16				**71%**					**29%**	
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	382										

Bibliography and references

- Allianz Research, *Global insurance market at a crossroads* – 2018.
- Bank for International Settlements, *International Banking and Financial Market Developments* - December 2018.
- BlackRock Investment Institute, *Global Investment Outlook* – June 2019.
- Ernst & Young, *Global banking outlook 2018: Pivoting toward an innovation-led strategy* - 2018
- International Monetary Fund, *Commodity Markets Outlook, Food Price Shock: Channels and Implications* – April 2019.
- International Conference on Computer System and Technologies, *Transition matrix generation* – 2004.
- International Monetary Fund, *World Economic, Situation and Prospects* – 2019.
- International Monetary Fund, Global Financial Stability Report, Vulnerabilities in a Maturing Credit Cycle – April 2019.
- Lianhe Ratings Global, *2018 Annual Research Reporto on Asset-Backed Securities Market in China* – March 2019.
- Moody's Analytics: www.moodysanalytics.com
- PCR Transition rating matriz (Cohort method) model – MS Excel 2018.
- Risk Classifications: www.ratingspcr.com/application/files/2615/1336/7436/PCR-MET-P-500.pdf
- World Bank, *Commodity Markets Outlook* – April 2019.

Annex

▪ Annex 1: Methodolofy for Estimating Transition Probabilities

Credit risk matrices are a key tool for credit risk analysis. Regarding investments, these matrices allow the comparison and forecast of the level of exposure to losses caused by default and devaluation due to credit rating movements. Consequently, they are cardinal points for financial applications such as portfolio risk management or the valuation of bonds and derivative instruments. In simple terms, a credit transition matrix is composed of "k" credit categories (grades or scales) of which "k-2" is in a state of non-compliance, one of them is in a state of default and one in a state of lack of information ("NR" or "Not Rated"). When the debtor's credit capacity changes, the rating agency may raise or lower the rating ("upgrade" or "downgrade" respectively). The transition matrix reflects the probability that an issue or company rated on an initial note can migrate to another within a specific period; This is called the "transition interval." In general, the initial risk note (granted in the “T” time) is denoted vertically in the headings of the first column, while the transitions in the risk rating (assigned or ratified in the “T + 1” time) they are denoted horizontally by the headings in the first row.

An example of the transition matrix is shown below:

Financial Institutions, Brokers and Dealers -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	487	93%								3%	4%
AA	912	2%	93%	1%						1%	2%
A	816		4%	90%	1%					1%	4%
BBB	673		1%	5%	87%	3%				1%	4%
BB	403		1%		10%	80%	2%	1%			7%
B	236					3%	90%	2%			5%
CCC	41							82%	8%		11%
Total	3568										

As reflected, stable ratings (contents located on the main diagonal of the matrix) capture the highest probability of occurrence in most cases. Empty cells represent a probability of zero, and some values have been removed from the matrix for reasons of clarity.

The Cohort Method

This approach assumes that time is divided into discrete intervals, within which one or more qualification change events may occur. The cohort method only compares the situation of the emissions or qualified companies at the beginning and end of each period, also called the “transition period”. Each measurement point is commonly known as a "snapshot." Taking, for example, the case of a year divided into quarterly photographs:

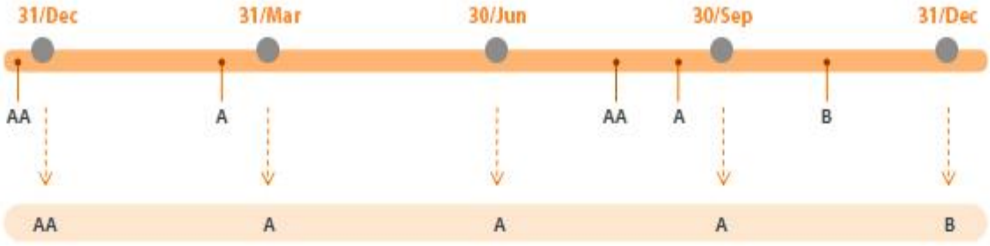
Figure 1
Cohort Method – Raw Data

Source: RISKO

The example shows the evolution of the risk categories for an issue that begins the year as “AA” and ends as “B”. During the year, the issue underwent four rating transitions. From the point of view of the cohort method, risk categories should only be considered on key dates at the end of each quarter. Therefore, the snapshots would show the following:

Figure 2

Cohort Method – Snapshots



Source: RISKO

As can be seen, assessing the situation at the end of each quarter only allows two transitions to be considered. The reason is that when the second transition occurs, the rating returns to its original level, (i.e. "A", "AA", and again "A"), therefore, this method does not consider what may happen between snapshots. It should be noted that, if the transition period had been taken equal to one year, only a transition from "AA" to "B" would have been placed (i.e., the categories at the ends).

Formally, the transition matrix is calculated as follows with the cohort method. Given $N_i(t)$ securities or companies classified with a rating category *"i"* at the beginning of each period of transition *"t"*, provided that $N_{ij}(t)$ as the number of securities or companies that have migrated to the category of *"j"* by the end of the transition period.

Then, the estimated probability of transition for period *"t"* is:

$$P_{ij}(t) = \frac{N_{ij}(t)}{N_i(t)}, j \neq i$$

The cohort method is the procedure followed by Standard & Poor's to build their credit transition matrices, which PCR takes as a source. Since it is considered the industry standard, this will be the method of choice for the following analysis. However, given the problems when using a long period between snapshots, quarterly snapshots were taken (and the resulting matrices were annualized using a fourth matrix power).

Annex 2: Ratings 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 1: 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: Pacific Credit Rating

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:

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

Annex 3: Assumptions and methodological aspects

a) **The treatment of the Default case (D) and Not-Rated (NR)**
In all the ratings scales, there are three special categories: the "D", "paid off" and "Not-Rated". The condition of 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. A rating is considered as "Paid Off" if the issuer of the security or money market instrument assigned the rating extinguished its obligation with respect to the security or money market instrument during the applicable time period by paying in full all outstanding principal and interest due according to the terms of the security or money market instrument, either because the security was due, was required or was prepaid and withdrawn other standing for other reasons when the company or the security of the issuer withdrawn the ratings for other different reasons than enters into default or paid off. The final form of the matrix depends on the ways in which these categories are processed as part of the analysis.

These are informational values, because it allows the identification of the proportion of securities or companies that migrated to these conditions.

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 (2017 y 2018)
- A three-years sample ending in 2018 (2015-2018)
- A ten-years sample ending in 2018 (2008-2018)
- The whole database sample (spanning 26 years from 1990 to 2018)

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 2: 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

N°	Original rating	Equivalent rating
7	E	C
8	E	D
9	E	E

Fuente: PCR

d) Other assumptions and adjustments

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

1. Country prefixes were removed from ratings.
2. Rating outlooks were not considered.
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.
5. 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 4: Transition/default matrices

I. Year 2018

Financial Institutions, Brokers and 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 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	96	**100%**									
AA	163		**98%**		**2%**						
A	152			**92%**	**2%**						**5%**
BBB	169		**2%**	**6%**	**79%**	**3%**			**1%**		**8%**
BB	48			**0.8%**	**24%**	**54%**					**21%**
B	24						**84%**				**16%**
CCC	6							**100%**			
Total	658										

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 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	9	**100%**									
AA	42		**100%**								
A	46			**84%**	**8%**						**8%**
BBB	39			**9%**	**90%**						
BB	0					0%					
B	0						0%				
CCC	0										
Total	136										

Corporate Issues* - 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 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	46	**69%**								**15%**	**15%**
AA	247		**71%**	**5%**						**10%**	**13%**
A	303		**1%**	**89%**						**5%**	**5%**
BBB	222			**10%**	**88%**	**2%**					
BB	7					**100%**					
B	0						0%				
CCC	2							**6%**	**15%**	**79%**	
Total	827										

*The corporate rating category include debt issuances of medium and long term debt and preferred stock.

Asset-Backed Securities -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 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	153	**83%**	**6%**								**11%**
AA	90		**100%**								
A	123			**80%**						**17%**	**3%**
BBB	16				**71%**					**29%**	
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	382										

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 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	0	0%									
AA	4		**100%**								
A	17		**22%**	**78%**							
BBB	26				**85%**						**15%**
BB	23					**100%**					
B	3						**100%**				
CCC	0										
Total	73										

II. Period 2015 - 2018

Financial Institutions, Brokers and Dealers -3 Years 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 (Percent)							Other Outcomes During 12/31/2015-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	286	**82%**								**8%**	**10%**
AA	582	**3%**	**90%**							**2%**	**5%**
A	527		**2%**	**92%**						**3%**	**3%**
BBB	511			**2%**	**91%**	**2%**				**1%**	**3%**
BB	208		**2%**		**11%**	**77%**	**2%**	**2%**			**5%**
B	122						**88%**	**3%**			**8%**
CCC	34							**74%**	**10%**		**15%**
Total	2270										

Insurance companies -3 Years 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 (Percent)							Other Outcomes During 12/31/2015-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	24	**100%**									
AA	125		**90%**							**2%**	**8%**
A	111			**91%**	**2%**						**7%**
BBB	104			**5%**	**86%**						**10%**
BB	5			**0.8%**	**39%**	**59%**					**2%**
B	0						0%				
CCC	0							0%			
Total	369										

Corporate Issues* - 3 Years 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 (Percent)							Other Outcomes During 12/31/2015-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	274	82%								7%	11%
AA	1032		81%	3%						7%	8%
A	702		1%	90%		1%				4%	5%
BBB	314			9%	80%	2%					8%
BB	23			0.6%	15%	84%					1%
B	0						0%				
CCC	14							42%	28%		30%
Total	2359										

*The corporate rating category include debt issuances of medium and long term debt and preferred stock.

Asset-Backed Securities -3 Years 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 (Percent)							Other Outcomes During 12/31/2015-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	591	71%	1%							2%	26%
AA	364		80%							16%	4%
A	358			71%						23%	6%
BBB	64				60%					40%	
BB	0					0%					
B	15						13%				87%
CCC	8							59%		41%	
Total	1400										

Public Finance -3 Years 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 (Percent)							Other Outcomes During 12/31/2015-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	0	0%									
AA	4		**100%**								
A	36		**10%**	**80%**							**10%**
BBB	81				**90%**						**10%**
BB	57					**94%**	**3%**		**4%**		
B	6					**50%**	**49%**		**1%**		
CCC	0										
Total	184										

III. Period 2008 – 2018

Financial Institutions, Brokers and Dealers -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	487	**93%**								**3%**	**4%**
AA	912	**2%**	**93%**	**1%**						**1%**	**2%**
A	816		**4%**	**90%**	**1%**					**1%**	**4%**
BBB	673		**1%**	**5%**	**87%**	**3%**				**1%**	**4%**
BB	403		**1%**		**10%**	**80%**	**2%**	**1%**			**7%**
B	236					**3%**	**90%**	**2%**			**5%**
CCC	41							**82%**	**8%**		**11%**
Total	3568										

Insurance companies -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	83	**95%**	**5%**								
AA	264		**91%**	**1%**						**1%**	**6%**
A	224		**2%**	**91%**	**2%**						**5%**
BBB	194			**6%**	**86%**						**8%**
BB	29				**12%**	**87%**					
B	0						0%				
CCC	0							0%			
Total	794										

Corporate Issues* - 10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	544	**91%**								**4%**	**6%**
AA	1418		**85%**	**3%**						**5%**	**6%**
A	768		**1%**	**90%**						**5%**	**5%**
BBB	338			**8%**	**80%**	**2%**					**9%**
BB	31				**11%**	**88%**					
B	0						0%				
CCC	31							**67%**	**19%**		**13%**
Total	3130										

*The corporate rating category include debt issuances of medium and long term debt and preferred stock.

Asset-Backed Securities -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	823	**81%**	**1%**							**1%**	**17%**
AA	475		**87%**							**11%**	**3%**
A	417		**1%**	**73%**	**1%**					**20%**	**5%**
BBB	64				**60%**					**40%**	
BB	0					0%					
B	33						**45%**				**55%**
CCC	15							**76%**		**24%**	
Total	1827										

Sovereign issuers -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (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	0			0%							
BBB	60				**100%**						
BB	117					**97%**	**3%**				
B	101					**11%**	**86%**	**3%**			
CCC	12					**2%**	**44%**	**44%**	**9%**		
Total	290										

Public Finance -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	0	0%									
AA	4		**100%**								
A	39		**9%**	**81%**							**9%**
BBB	110				**90%**	**3%**					**7%**
BB	64				**6%**	**89%**	**2%**		**3%**		
B	6				**1%**	**49%**	**49%**		**1%**		
CCC	0										
Total	223										

Annex 5: Transition/default matrices (Asset-Backed Securities)

I. Year 2018

Asset-Backed Securities (Residential morgage backed securities) -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 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	6	**100%**									
AA	0		0%								
A	3			**100%**							
BBB	0				0%						
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	9										

Asset-Backed Securities (Collateralized loan obligation) -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 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	18	**81%**								**19%**	
AA	0		0%								
A	0			0%							
BBB	6				**100%**						
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	24										

Asset-Backed Securities (Collateralized debt obligation) -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 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	18	**80%**								**20%**	
AA	0		0%								
A	0			0%							
BBB	6				**100%**						
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	24										

Asset-Backed Securities (Other structured finance products) -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 (Percent)							Other Outcomes During 12/31/2017-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	129	**75%**	**3%**							**14%**	**8%**
AA	87		**100%**								
A	17			**78%**						**22%**	
BBB	10				**66%**					**34%**	
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	243										

II. Period 2015 – 2018

Asset-Backed Securities (Residential mortgage backed securities) -3 Years 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 (Percent)							Other Outcomes During 12/31/2015-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	12	**20%**									**80%**
AA	0		0%								
A	6			**20%**							**80%**
BBB	0				0%						
BB	0					0%					
B	5						**6%**				**94%**
CCC	0							0%			
Total	23										

Asset-Backed Securities (Collateralized loan obligation) -3 Years 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 (Percent)							Other Outcomes During 12/31/2015-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	74	**90%**								**10%**	
AA	0		0%								
A	0			0%							
BBB	24				**100%**						
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	98										

Asset-Backed Securities (Collateralized debt obligation) -3 Years 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 (Percent)							Other Outcomes During 12/31/2015-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	74	**90%**								**10%**	
AA	0		0%								
A	0			0%							
BBB	24				**100%**						
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	98										

Asset-Backed Securities (Other structured finance products) -3 Years 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 (Percent)							Other Outcomes During 12/31/2015-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	493	**84%**	**1%**							**5%**	**10%**
AA	311	**1%**	**95%**							**3%**	**1%**
A	33			**78%**						**11%**	**11%**
BBB	29				**87%**					**13%**	
BB	0					0%					
B	5						**41%**				**59%**
CCC	0							0%			
Total	871										

III. Period 2008 – 2018

Asset-Backed Securities (Residential morgage backed securities) -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	47	**62%**									**38%**
AA	0		0%								
A	22			**60%**							**40%**
BBB	0				0%						
BB	0					0%					
B	23						**46%**				**54%**
CCC	0							0%			
Total	92										

Asset-Backed Securities (Collateralized loan obligation) -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	84	**91%**								**9%**	
AA	0		0%								
A	0			0%							
BBB	24				**100%**						
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	108										

Asset-Backed Securities (Collateralized debt obligation) -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	84	**91%**								**9%**	
AA	0		0%								
A	0			0%							
BBB	24				**100%**						
BB	0					0%					
B	0						0%				
CCC	0							0%			
Total	108										

Asset-Backed Securities (Other structured finance products) -10 Years 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 (Percent)							Other Outcomes During 12/31/2008-12/31/2018 (Percent)		
Credit Rating	Number of Ratings Outstanding	AAA	AA	A	BBB	BB	B	CCC	Default	Paid off	Withdrawn (other)
AAA	605	**87%**	**1%**							**4%**	**8%**
AA	403	**1%**	**96%**							**2%**	**1%**
A	34			**78%**						**11%**	**11%**
BBB	29				**87%**					**13%**	
BB	0					0%					
B	5						**41%**				**59%**
CCC	0							0%			
Total	1076										