Default, Transition, and Recovery

2018 Annual Taiwan Ratings Corp. Corporate Default And Rating Transition Study

May 21, 2019

(Editor's note: This article was originally published on May 21, 2019. We are republishing it to correct a typographical error in table 4. This correction has no impact on the article's findings.)

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Key Takeaways

- Ratings stability among Taiwan Ratings Corp.'s corporate ratings--as measured by the percentage of issuers with the same ratings at the end of the year as at the beginning--fell slightly in 2018, to 85.8% from 88.5%.
- Last year was the second year in a row with no downgrades or defaults. The proportion of upgrades rose to 10.6% in 2018 from 6.5% in 2017.
- Taiwan Ratings Corp.'s ratings continue to show a clear correspondence between rating and default remoteness, with default rates among investment-grade ratings well below those of speculative-grade ratings across all time frames. This finding is consistent with the performance of S&P Global Ratings' global scale ratings.

Among nonfinancial corporate entities and financial services companies rated by Taiwan Ratings Corp. (TRC), the upgrade ratio (the proportion of ratings that were raised) in 2018 surpassed 10%, while there were no downgrades or defaults. Ratings stability (as measured by the proportion of ratings that remained the same from the start of the year to the end of the year) was 85.8%, higher than the historical weighted average of 76.8%.

This default and rating transition study closely examines the track record of the 314 corporate issuer credit ratings that TRC has assigned since operations began in 1998. We primarily measure ratings migration over time and provide quantitative measures of ratings distribution and movement. Ratings covered in this study are those on Taiwan-based obligors in the nonfinancial, utility, insurance, and financial services sectors. These include public and confidentially rated entities, as well as those with ratings that were later withdrawn. The negative relationships between higher ratings and both ratings volatility and default frequency are consistent with those observed in other S&P Global Fixed Income Research default studies.

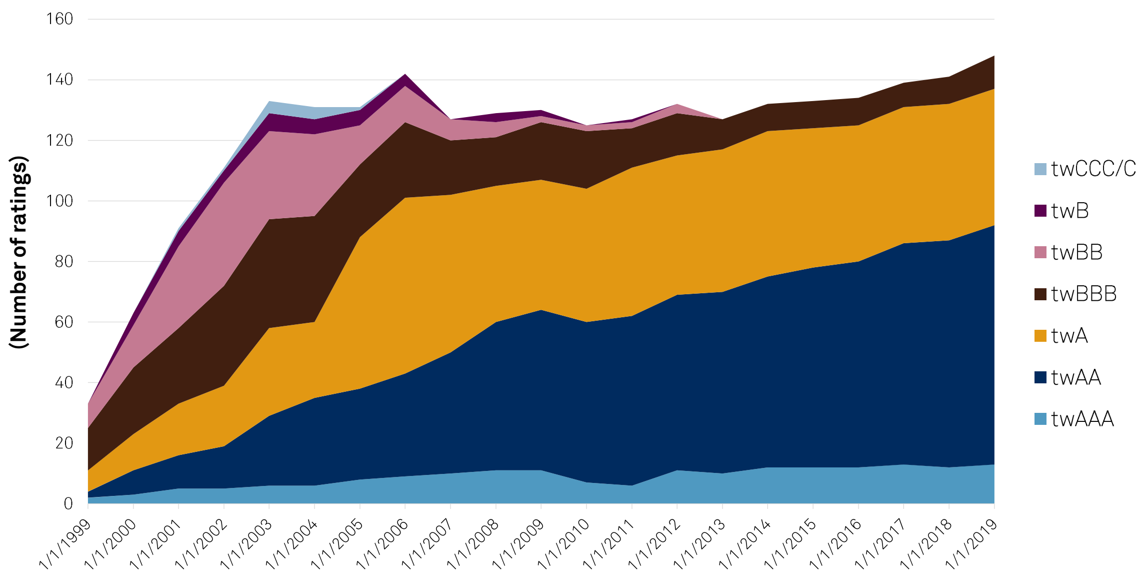
The default risks for S&P Global Ratings' global scale ratings and the ratings on TRC's scale, which is a national scale, differ. National scale credit ratings are calibrated to better distinguish the relative credit risk within a country. (S&P Global Ratings affirmed the rating on the government of Taiwan at 'AA-/A-1+' with a stable outlook in April 2018.) Because of the differences in the two ratings scales, we do not make any direct comparisons between S&P Global Ratings' and TRC's ratings in this report. However, generally, both ratings scales display the same principle: Higher ratings exhibit lower default rates and greater stability than lower ratings.

The Taiwanese economy grew 2.6% in 2018, lower than the 3.1% growth in 2017 but above the average of 2.4% annual growth over the past five years. S&P Global economists predict the economy will grow between 2.2% and 2.5% in each year from 2019-2022. The unemployment rate was 3.7% at the end of 2018, and S&P Global economists believe it will continue falling to 3.0% by the end of 2022. These strong underpinnings should support continued credit strength.

The number of TRC ratings on nonfinancial corporate and financial services companies (including insurance companies) has been small but meaningful over time, starting at 33 active ratings in 1999 and increasing to 148 by the start of 2019. Historically, TRC corporate ratings have been heavily skewed toward investment grade ('twBBB-' or higher), and this trend has only been increasing (see chart 1). In fact, for the seventh year in a row, all TRC corporate and financial services ratings were investment grade at the start of 2019. Speculative-grade ('twBB+' or lower) TRC ratings have been steadily decreasing as a portion of the population since they peaked at 36% at the start of 2001.

Chart 1

Taiwan National Scale Corporate Rating Distribution



Data are as of Jan. 1. Source: S&P Global Fixed Income Research.

No Downgrades Or Defaults In 2018

To analyze rating actions during the year, we look at the ratings at the start of the year and at the end of the year. During 2018, there were 15 upgrades and zero downgrades or defaults (see table 1). This was the second year in a row with no downgrades among TRC ratings. However, five ratings were withdrawn during the year, though none of them was lowered prior to withdrawal.

Ratings stability fell slightly, to 85.8% in 2018 from 88.5% in 2017. In general, higher ratings tend to be more stable than lower ratings, and the TRC population has been exclusively investment grade for six years straight.

Table 1

Summary Of Annual Ratings Changes In Taiwan (1999-2018)

Year	Issuer count as of Jan. 1	Upgrades (%)	Downgrades (%)*	Defaults (%)	Withdrawn ratings (%)	Unchanged ratings (%)	Changed ratings (%)	Downgrade/ upgrade ratio
1/1/1999	33	9.1	0.0	0.0	0.0	90.9	9.1	0.0
1/1/2000	63	3.2	12.7	1.6	3.2	79.4	20.6	4.0
1/1/2001	91	2.2	11.0	0.0	3.3	83.5	16.5	5.0
1/1/2002	111	17.1	18.0	0.0	12.6	52.3	47.8	1.1
1/1/2003	133	15.0	3.8	0.0	13.5	67.7	32.3	0.3
1/1/2004	132	57.6	2.3	0.0	9.1	31.1	68.9	0.0
1/1/2005	135	14.1	0.7	0.7	5.2	79.3	20.7	0.1
1/1/2006	148	15.5	2.7	0.7	16.9	64.2	35.8	0.2
1/1/2007	136	17.7	4.4	3.7	6.6	67.7	32.4	0.2
1/1/2008	133	4.5	5.3	1.5	5.3	83.5	16.5	1.2
1/1/2009	131	0.8	17.6	0.0	9.2	72.5	27.5	23.1
1/1/2010	127	4.7	3.2	0.0	7.1	85.0	15.0	0.7
1/1/2011	124	12.1	5.7	0.0	2.4	79.8	20.2	0.5
1/1/2012	134	3.0	3.0	0.0	11.2	82.8	17.2	1.0
1/1/2013	126	6.4	3.2	0.0	4.0	86.5	13.5	0.5
1/1/2014	131	3.1	1.5	0.0	3.8	91.6	8.4	0.5
1/1/2015	135	5.9	3.7	0.0	3.7	86.7	13.3	0.6
1/1/2016	135	5.9	3.0	0.7	1.5	88.9	11.1	0.5
1/1/2017	139	6.5	0.0	0.0	5.0	88.5	11.5	0.0
1/1/2018	141	10.6	0.0	0.0	3.6	85.8	14.2	0.0
Weighted average (1999-2018)		11.2	4.8	0.5	6.8	76.8	23.2	0.4

*Excludes downgrades to 'D', shown separately in default column. Note: Rating changes measured from rating as of Jan. 1 to rating as of Dec. 31 exclude all intermediate rating changes. Source: S&P Global Fixed Income Research.

Of the 15 upgrades in 2018, four were for companies under the umbrella of **Formosa Group**, whose various subsidiaries were upgraded in October to 'twAA' from 'twAA-' on improving debt leverage. In total, nine financial or insurance companies were upgraded, while six nonfinancial corporate issuers were upgraded. All upgrades were movements of one notch (see table 2).

Table 2

2018 One-Year Transitions

(Number of ratings)

From/to	Total	twAAA	twAA+	twAA	twAA-	twA+	twA	twA-	twBBB+	twBBB	twBBB-	twBB+	twBB	twBB-	twB+	twB	twB-	twCCC/C	D	NR
twAAA	12	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
twAA+	21	1	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
twAA	24	0	2	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
twAA-	30	0	0	5	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
twA+	18	0	0	0	3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
twA	18	0	0	0	0	3	15	0	0	0	0	0	0	0	0	0	0	0	0	0
twA-	9	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	1
twBBB+	5	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0
twBBB	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
twBBB-	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
twBB+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
twBB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
twBB-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
twB+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
twB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
twB-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
twCCC/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

D--Default. NR--Not rated. Source: S&P Global Fixed Income Research.

Table 3

New Issuers By Sector

(Number of issuers)	Financial institutions	Industrials and utilities	Total
1/1/1998	31	2	33
1/1/1999	25	5	30
1/1/2000	26	5	31
1/1/2001	9	14	23
1/1/2002	29	11	40
1/1/2003	8	8	16
1/1/2004	6	9	15
1/1/2005	10	9	19
1/1/2006	7	8	15
1/1/2007	10	3	13
1/1/2008	7	2	9
1/1/2009	2	3	5
1/1/2010	1	5	6
1/1/2011	4	4	8
1/1/2012	3	2	5
1/1/2013	7	1	8
1/1/2014	3	5	8
1/1/2015	2	3	5
1/1/2016	3	1	4
1/1/2017	1	7	8
1/1/2018	1	6	7
Total	**195**	**113**	**308**
% of total	63.3	36.7	100.0

Source: S&P Global Fixed Income Research.

Lorenz Curves And Gini Coefficients

Gini ratios measure the rank-ordering power of ratings over a given time horizon. They are ratios of actual rank-ordering performance to theoretically perfect rank ordering. Over each time span, lower ratings correspond to higher default rates (see charts 2-4). For example, in the one-year Lorenz curve, 55% of defaults occurred in the speculative-grade category, while speculative-grade ratings constituted only 10% of all corporate ratings. If the rank ordering of ratings had little predictive value, the cumulative share of defaulting corporate entities and the cumulative share of all entities at each rating would be nearly the same, producing a Gini ratio of zero (see "Appendix II: Gini Methodology").

Chart 2

Taiwan Corporate One-Year Lorenz Curve and Gini Coefficient

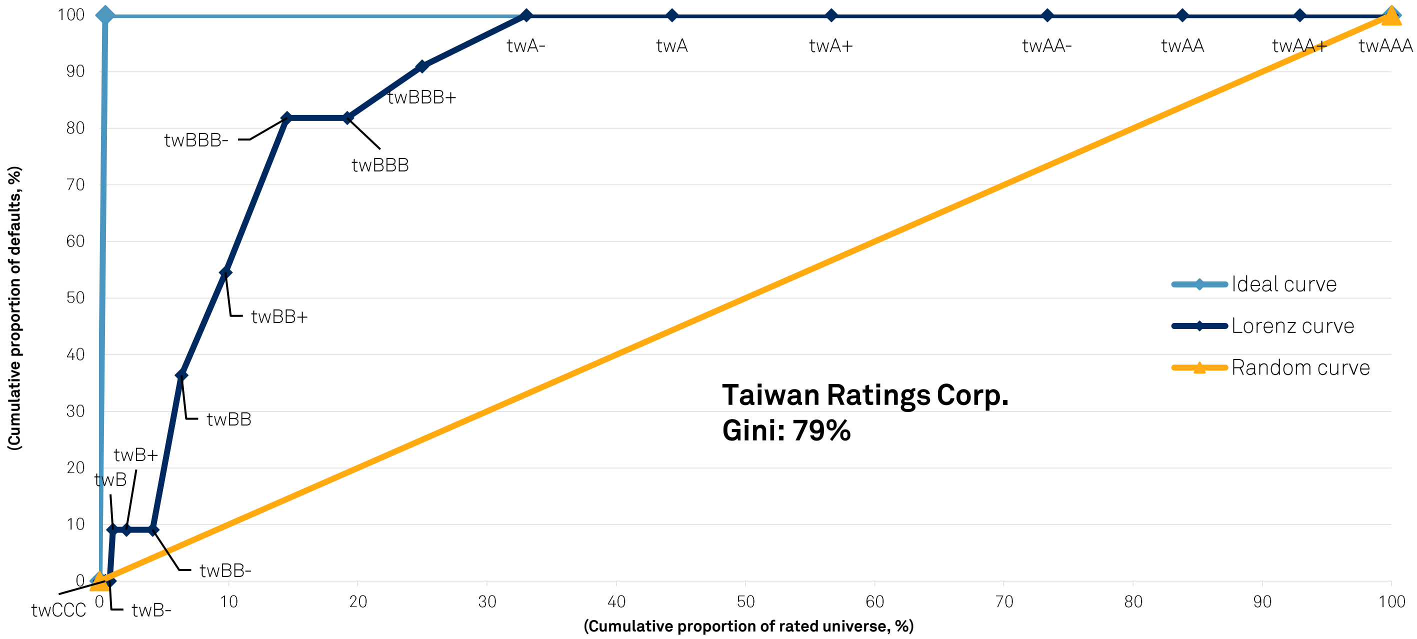


Chart 3

Taiwan Corporate Three-Year Lorenz Curve And Gini Coefficient

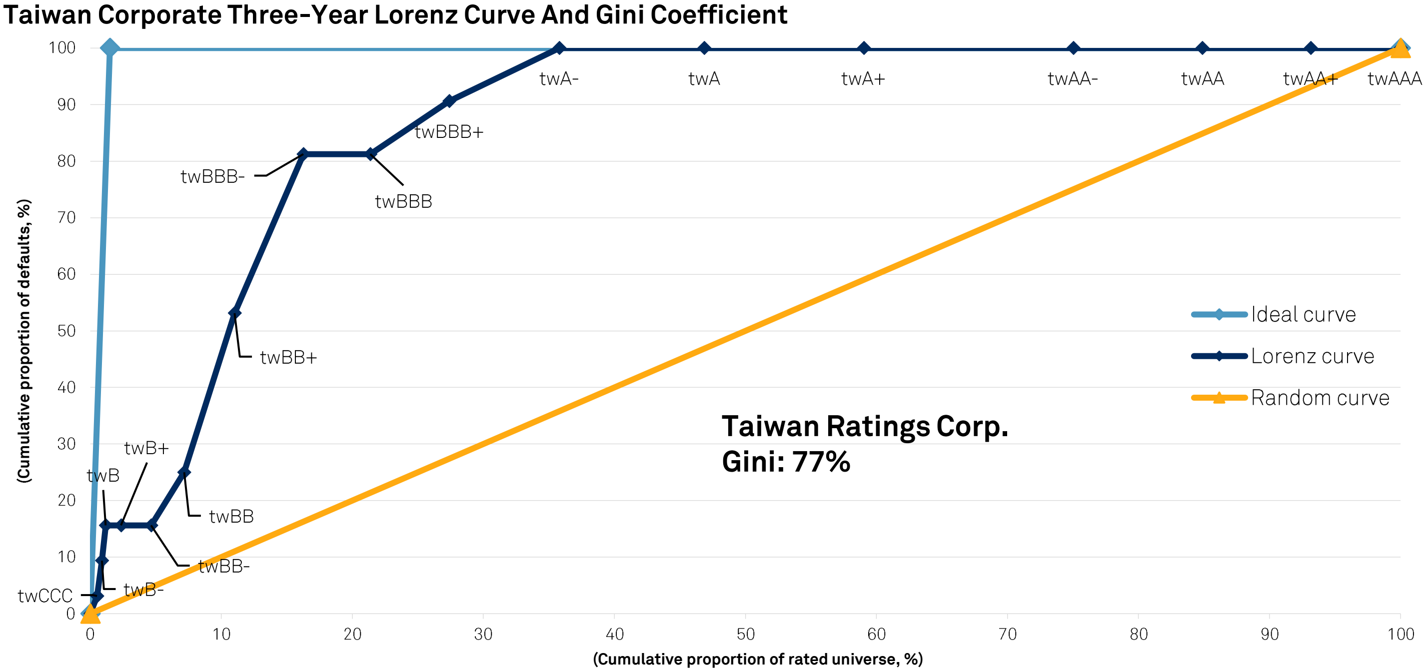
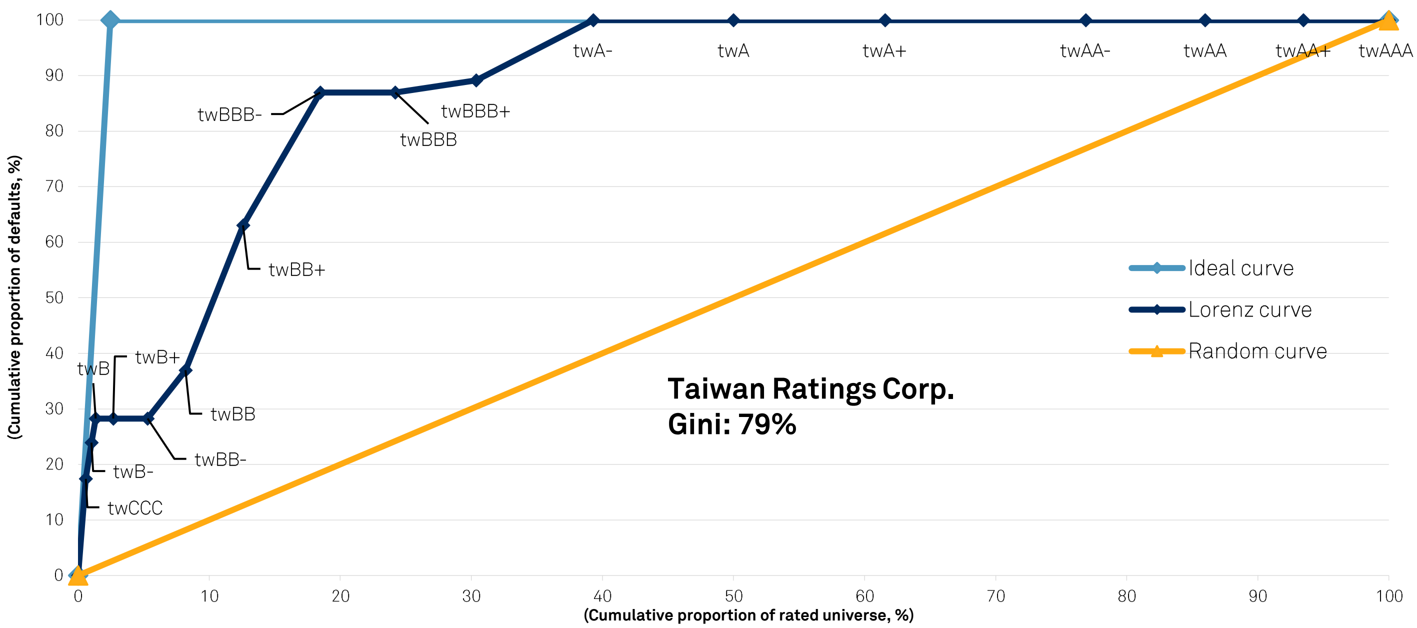


Chart 4

Taiwan Corporate Five-Year Lorenz Curve And Gini Coefficient



Ratings And Cumulative Default Rates Remained Negatively Correlated

This study found that defaults and ratings are negatively correlated, consistent with all of S&P Global Fixed Income Research's default studies. The higher the rating, the lower the incidence of default. This relationship remains true even for a smaller rated population, as is the case with TRC ratings. One exception is the 'twCCC'/'twCC' category, due to its very small dataset, for which there is no default activity until the three-year horizon. However, by year four, this category's default rate is well above the 'twB' category's--in line with expectations.

Table 4

Taiwan Cumulative Average Default Rates, 1999-2018

	--Time horizon (years)--									
(%)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
twAAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
twAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
twA	0.13	0.27	0.41	0.57	0.74	0.93	1.13	1.13	1.13	1.13
twBBB	1.09	2.49	3.34	3.93	3.93	4.24	4.87	5.54	6.24	6.24
twBB	2.7	4.86	6.49	7.03	8.65	10.27	11.89	12.99	13.55	13.55
twB	2.56	7.69	10.26	10.26	12.82	15.38	20.51	25.64	28.3	28.3
twCCC/C	0.00	0.00	9.09	45.45	72.73	90.91	100	N/A	N/A	N/A
Investment grade	0.23	0.52	0.73	0.89	0.95	1.09	1.3	1.46	1.64	1.64
Speculative grade	2.55	5.11	7.23	9.36	12.34	14.89	17.45	19.18	20.05	20.05
All rated	0.45	0.97	1.39	1.79	2.21	2.67	3.22	3.63	3.92	3.92

N/A--Not applicable. Source: S&P Global Fixed Income Research.

Transition Matrices

Transition matrices show how ratings behave over time, including movements to other rating categories, movements to default, and rating withdrawals (see tables 5-8). The results presented here are consistent with other S&P Global Fixed Income Research default studies, in that there is a clear correspondence between higher ratings and lower default activity. This relationship holds over shorter as well as longer periods.

Ratings stability is also generally higher among investment-grade ratings than speculative-grade ratings. For example, over a one-year time frame, an average of 95% of 'twAA' rated issuers maintain this rating, higher than 59.5% of 'twBB' rated issuers. This general relationship is also true over longer horizons. A key observation when analyzing transition matrices that present averages computed over multiple static pools is that the standard deviations associated with each transition point in the matrix are large relative to the averages (outside of stability rates).

Table 5

Average One-Year Transition Rates (1999-2018)

(%)

From/to	twAAA	twAA	twA	twBBB	twBB	twB	twCCC/CC	D	NR
twAAA	88.30	7.02	0.00	0.00	0.00	0.00	0.00	0.00	4.68
	(15.10)	(13.77)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(6.48)
twAA	1.46	94.96	1.01	0.00	0.00	0.00	0.00	0.00	2.58
	(2.05)	(3.47)	(1.51)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(2.32)
twA	0.00	6.09	87.95	1.68	0.13	0.00	0.00	0.13	4.02
	(0.00)	(6.51)	(7.40)	(3.13)	(0.51)	(0.00)	(0.00)	(0.54)	(4.12)
twBBB	0.00	0.27	9.26	75.75	1.36	0.00	0.00	1.09	12.26
	(0.00)	(1.10)	(20.86)	(22.82)	(2.01)	(0.00)	(0.00)	(3.22)	(10.91)
twBB	0.00	0.00	0.54	12.43	59.46	0.54	0.54	2.70	23.78
	(0.00)	(0.00)	(1.36)	(17.32)	(27.35)	(2.83)	(1.18)	(6.81)	(17.17)
twB	0.00	0.00	0.00	0.00	7.69	46.15	7.69	2.56	35.90
	(0.00)	(0.00)	(0.00)	(0.00)	(9.78)	(31.77)	(17.04)	(9.36)	(35.84)
twCCC/CC	0.00	0.00	0.00	0.00	36.36	0.00	63.64	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(45.17)	(0.00)	(45.17)	(0.00)	(0.00)

Note: Parenthetical numbers are standard deviations. D--Default. NR--Not rated Source: S&P Global Fixed Income Research.

Table 6

Average Three-Year Transition Rates (1999-2018)

(%)

From/to	twAAA	twAA	twA	twBBB	twBB	twB	twCCC/CC	D	NR
twAAA	71.92	17.81	0.00	0.00	0.00	0.00	0.00	0.00	10.27
	(22.01)	(21.95)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(9.39)
twAA	3.62	87.92	2.42	0.00	0.00	0.00	0.00	0.00	6.04
	(3.77)	(4.78)	(1.94)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(2.22)
twA	0.00	14.81	69.50	3.81	0.59	0.00	0.00	0.44	10.85
	(0.00)	(11.68)	(11.20)	(4.92)	(1.31)	(0.00)	(0.00)	(0.85)	(4.37)
twBBB	0.00	2.86	20.00	43.43	2.00	0.00	0.00	3.43	28.29
	(0.00)	(3.74)	(25.97)	(26.00)	(3.74)	(0.00)	(0.00)	(5.40)	(14.88)
twBB	0.00	0.00	5.41	23.78	18.38	0.00	1.08	6.49	44.86
	(0.00)	(0.00)	(7.91)	(14.11)	(20.97)	(0.00)	(2.25)	(13.80)	(16.86)
twB	0.00	0.00	2.56	2.56	5.13	2.56	15.38	10.26	61.54
	(0.00)	(0.00)	(6.34)	(7.99)	(9.95)	(6.34)	(26.02)	(12.40)	(35.06)
twCCC/CC	0.00	0.00	0.00	0.00	72.73	9.09	9.09	9.09	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(40.34)	(32.14)	(32.14)	(13.45)	(0.00)

Note: Parenthetical numbers are standard deviations. D--Default. NR--Not rated. Source: S&P Global Fixed Income Research.

Table 7

Average Five-Year Transition Rates (1999-2018)

(%)

From/to	twAAA	twAA	twA	twBBB	twBB	twB	twCCC/CC	D	NR
twAAA	61.48	25.41	0.00	0.00	0.00	0.00	0.00	0.00	13.11
	(20.05)	(21.11)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(9.53)
twAA	4.91	83.14	2.95	0.00	0.00	0.00	0.00	0.00	9.00
	(5.36)	(5.93)	(1.86)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(2.23)
twA	0.00	19.56	57.14	3.57	0.51	0.00	0.00	0.85	18.37
	(0.00)	(13.45)	(14.56)	(3.73)	(1.06)	(0.00)	(0.00)	(1.01)	(6.64)
twBBB	0.00	6.93	25.00	27.11	0.30	0.00	0.00	3.61	37.05
	(0.00)	(6.37)	(26.31)	(19.24)	(1.48)	(0.00)	(0.00)	(5.22)	(17.25)
twBB	0.00	1.08	7.57	20.00	3.78	0.00	0.00	8.65	58.92
	(0.00)	(1.62)	(7.77)	(12.62)	(4.08)	(0.00)	(0.00)	(13.11)	(15.62)
twB	0.00	0.00	2.56	0.00	12.82	0.00	2.56	12.82	69.23
	(0.00)	(0.00)	(7.05)	(0.00)	(20.04)	(0.00)	(7.99)	(12.62)	(32.94)
twCCC/CC	0.00	0.00	0.00	0.00	18.18	9.09	0.00	72.73	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(43.12)	(13.45)	(0.00)	(40.34)	(0.00)

Note: Parenthetical numbers are standard deviations. D--Default. NR--Not rated. Source: S&P Global Fixed Income Research.

Table 8

Average 10-Year Transition Rates (1999-2018)

(%)

From/to	twAAA	twAA	twA	twBBB	twBB	twB	twCCC/CC	D	NR
twAAA	40.79	44.74	0.00	0.00	0.00	0.00	0.00	0.00	14.47
	(14.54)	(8.54)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(9.81)
twAA	5.36	76.03	3.47	0.00	0.00	0.00	0.00	0.00	15.14
	(4.18)	(3.97)	(2.62)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(4.18)
twA	0.00	27.30	38.44	3.62	0.00	0.00	0.00	0.84	29.81
	(0.00)	(10.37)	(10.76)	(2.01)	(0.00)	(0.00)	(0.00)	(0.98)	(9.59)
twBBB	1.12	13.11	21.35	14.98	0.00	0.00	0.00	6.74	42.70
	(1.48)	(7.17)	(16.99)	(8.38)	(0.00)	(0.00)	(0.00)	(6.68)	(16.23)
twBB	0.00	2.25	3.37	6.18	0.00	0.00	0.00	13.48	74.72
	(0.00)	(2.48)	(3.59)	(5.40)	(0.00)	(0.00)	(0.00)	(11.04)	(6.76)
twB	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.95	71.05
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(31.33)	(31.33)
twCCC/CC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: Parenthetical numbers are standard deviations. D--Default. NR--Not rated. Source: S&P Global Fixed Income Research.

Appendix I: Default Methodology And Definitions

An issuer credit rating reflects TRC's opinion of a company's overall capacity to pay its obligations (that is, its fundamental creditworthiness). This opinion focuses on the obligor's ability and willingness to meet its financial commitments on a timely basis, and it generally indicates the likelihood of default regarding all financial obligations of the firm. It is not necessary for a company to have rated debt in order to be assigned an issuer credit rating.

Specific issues are typically rated as high as or lower than the issuer rating, depending on their relative priority within the company's debt structure. For lower-rated entities, the issuer credit ratings are generally two notches higher than the subordinated debt ratings; otherwise, they are generally one notch higher. Therefore, though a 'twBB+' issuer credit rating is generally paired with a 'twBB-' subordinated debt rating, a 'twAA' issuer credit rating usually corresponds to a 'twAA-' subordinated rating.

S&P Global Fixed Income Research's ongoing enhancement of the default database used to generate this study may lead to outcomes that differ to some degree from those reported in previous studies. However, this poses no continuity problem because each study reports statistics back to Dec. 31, 1998. Therefore, each annual default study is self-contained and effectively supersedes all previous versions.

Issuers included in this study

This study analyzes the rating histories of 314 companies to which TRC had assigned ratings as of Dec. 31, 1998, or that were first rated between that date and Dec. 31, 2018. These include industrials, utilities, insurance companies, financial holding companies, banks, securities firms, and other financial services in Taiwan with long-term credit ratings. The study includes publicly and confidentially rated entities, as well as those with ratings that were withdrawn after initial assignment. The analysis excludes public information ("pi") ratings and ratings based on the guarantee of another company. Structured finance vehicles, public-sector issuers, and sovereign issuers are the subjects of separate default and transition studies and are excluded from this study.

To avoid overcounting, we exclude subsidiaries with debt that is fully guaranteed by a parent or with default risk that is considered identical to that of a parent, where both the parent and subsidiaries have Taiwan national scale ratings. The latter are companies with obligations that are not legally guaranteed by a parent but that have operating or financing activities that are so inextricably entwined with those of the parent that it would be impossible to imagine the default of one and not the other. At times, however, some of these subsidiaries might not have been covered by a parent's guarantee, or the relationship that combines the default risk of parent and subsidiary might have come to an end or might not have begun. We include such subsidiaries for the period during which they had distinct and separate risk of default.

Definition of default

A default event is recorded on the first occurrence of a payment default on any financial obligation, rated or unrated, other than a financial obligation subject to a bona fide commercial dispute; an exception occurs when an interest payment missed on the due date is made within the grace period. Preferred stock is not considered a financial obligation; thus, a missed preferred stock dividend is not normally equated with default. However, we consider distressed exchanges to be defaults whenever the debtholders are coerced into accepting substitute instruments with lower coupons, longer maturities, or any other diminished financial terms.

TRC will usually lower an issue rating to 'D' following a company's default on the corresponding obligation. In addition, 'SD' (selective default) is used whenever it is believed that an obligor that has selectively defaulted on a specific issue or class of obligations will continue to meet its payment obligations on other issues or classes of obligations in a timely matter. An 'R' (regulatory intervention) issuer rating indicates that an obligor is under regulatory supervision owing to its financial condition. This does not necessarily indicate a default event, but the regulator may have the power to favor one class of obligations over others or pay some obligations and not others.

We deem 'D', 'SD', and 'R' issuer ratings to be defaults for the purpose of this study. A default is assumed to take place on the earliest of: the date TRC revised the ratings to 'D', 'SD', or 'R'; the date when a debt payment was missed; the date a distressed exchange offer was announced; or the date the debtor filed for or was forced into bankruptcy.

Static pool methodology

S&P Global Fixed Income Research conducts its default studies on the basis of groupings called static pools. These are formed by grouping issuers by rating category at the beginning of each year covered by the study. Each static pool is followed from that point forward. All companies included in the study are assigned to one or more static pools. When an issuer defaults, that default is assigned back to all of the static pools to which the issuer belongs.

We use the static pool methodology to avoid certain pitfalls in estimating default rates, ensuring that default rates account for rating migration and allowing them to be calculated across multiperiod time horizons. Some methods for calculating default and rating transition rates might charge defaults against only the initial rating on the issuer--ignoring more recent rating changes that supply more current information. Other methods may calculate default rates using only the most recent year's default and rating data, which may yield comparatively low default rates during periods of high rating activity because they ignore prior years' default activity.

The pools are static in the sense that their membership remains constant over time. Each static pool can be interpreted as a buy-and-hold portfolio. Because errors, if any, are corrected by every new update, and because the criteria for inclusion or exclusion of companies in the default study are subject to minor revisions as time goes by, it is not possible to compare static pools across different studies. Therefore, every update revises results back to the same starting date of Dec. 31, 1998, to avoid continuity problems.

Entities that have had ratings withdrawn--that is, revised to not rated ("NR")--are surveyed with the aim of capturing a potential default. These companies, as well as those that have defaulted, are excluded from subsequent static pools.

For instance, the 1999 static pool consists of all companies rated as of 12:01 a.m. on Jan. 1, 1999. Adding those companies first rated in 1999 to the surviving members of the 1999 static pool forms the 2000 static pool. All rating changes that took place are reflected in the newly formed 2000 static pool. This same method was used to form static pools for 2001-2018.

Consider the following example: An issuer is originally rated 'twBB' in mid-1998 and is downgraded to 'twB' in 2000. This is followed by a rating withdrawal ("NR") in 2002 and a default ('D') in 2005. This hypothetical company would be included in the 1999 and 2000 pools with the 'twBB' rating assigned to it at the beginning of those years; likewise, it would be included in the 2001 and 2002 pools with the 'twB' rating. It would not be part of the 1998 pool because it was not rated as of the first day of that year, and it would not be included in any pool after the last day of 2002 because the rating had been withdrawn by then. Yet each of the four pools in which this company was included (1999-2002) would record its 2005 default at the appropriate time horizon.

Ratings are withdrawn when an entity's entire debt is paid off or when the program or programs rated are terminated and the relevant debt extinguished. Withdrawals may also occur as a result of mergers and acquisitions. Other ratings are withdrawn because of a lack of cooperation, particularly when a company is experiencing financial difficulties and refuses to provide all the information needed to continue surveillance on the ratings.

Default rate calculation

Annual default rates are calculated for each static pool, first in units and later as percentages with respect to the number of issuers in each rating category. Finally, these percentages are combined to obtain cumulative default rates for the 20 years covered by the study.

Issuer-weighted default rates

Averages that appear in this study are calculated based on the number of issuers rather than the dollar amounts affected by defaults or rating changes. Although dollar amounts provide information about the portion of the market that is affected by defaults or rating changes, issuer-weighted averages are more useful measures of the performance of ratings.

Many people in the investment field use statistics from this default study to estimate the probability of default and the probability of rating transition. It is important to note that we do not imply a specific probability of default; however, our historical default rates are frequently used to estimate these characteristics.

Average cumulative default rate calculation

Cumulative default rates that average the experience of all static pools are derived by calculating marginal default rates, conditional on survival (survivors being nondefaulters) for each possible time horizon and for each static pool, weight-averaging the conditional marginal default rates, and accumulating the average conditional marginal default rates. Conditional default rates are calculated by dividing the number of issuers in a static pool that default at a specific time horizon by the number of issuers that survived (did not default) to that point in time. Weights are based on the number of issuers in each static pool. Cumulative default rates are one minus the product of the proportion of survivors (nondefaulters).

Time sample

This update limits the reporting of default rates to the selected time horizon; however, the data have been gathered for 20 years, and all calculations are based on the rating experience of that period. The maturities of most obligations are much shorter than the selected time horizon. In addition, average default statistics become less reliable at longer time horizons because the sample size becomes smaller and the cyclical nature of default rates increases its effect on averages.

Default patterns share broad similarities across all static pools, suggesting that TRC's rating standards have been consistent over time. Adverse business conditions tend to coincide with default upswings for all pools. Speculative-grade issuers have been hit the hardest by these upswings, but investment-grade default rates also increase in stressful periods.

Transition analysis

Transition rates compare issuer ratings at the beginning of a period with ratings at the end of the period. To compute one-year rating transition rates by rating category, the rating on each entity at the end of a particular year is compared with the rating at the beginning of the same year. An issuer that remained rated for more than one year is counted as many times as the number of years it was rated. For instance, an issuer continually rated from the middle of 1998 to the middle of 2003 would appear in the four consecutive one-year transition matrices from 1999-2002. All 1999 static pool members still rated on Dec. 31, 2018, had 20 one-year transitions, while companies first rated between Jan. 1, 2018, and Dec. 31, 2018, had only one.

Each one-year transition matrix displays all rating movements between letter categories from the beginning of the year through year-end. For each rating listed in the matrix's leftmost column, there are nine ratios listed in the rows, corresponding to the ratings from 'twAAA' to 'D', plus an entry for "NR."

Practical application of transition rates

Rating transition rates are useful to investors and credit professionals for whom rating stability is important. For instance, investors who are restricted by law or are inclined to invest in top-grade bonds would want to assess the likelihood that TRC analysts will continue to assign high ratings to their investments. Conversely, investors buying high-yield bonds in hopes of profiting from an upgrade would be able to gauge that expectation.

The credit community might also use rating transition information in part to determine maturity exposure limits or to measure credit risk in the context of the value-at-risk models. Rating transition matrices could also be constructed to produce stressed default rates. Such matrices are often used for credit risk measurement. In addition, multiyear transition matrices are valuable tools that can be used to forecast future rating distributions and may be better suited for certain applications than one-year transition matrices.

Comparing transition rates with default rates

Rating transition rates may be compared with the marginal and cumulative default rates described in the previous section. For example, the one-year default rate column of table 4 is equivalent to column 'D' of the average one-year transition matrix in table 5. Average cumulative default rates are the summary of all static pools from 1998-2018, while the number of pools used in the average transition rate is limited by the transition's time horizon.

Appendix II: Gini Methodology

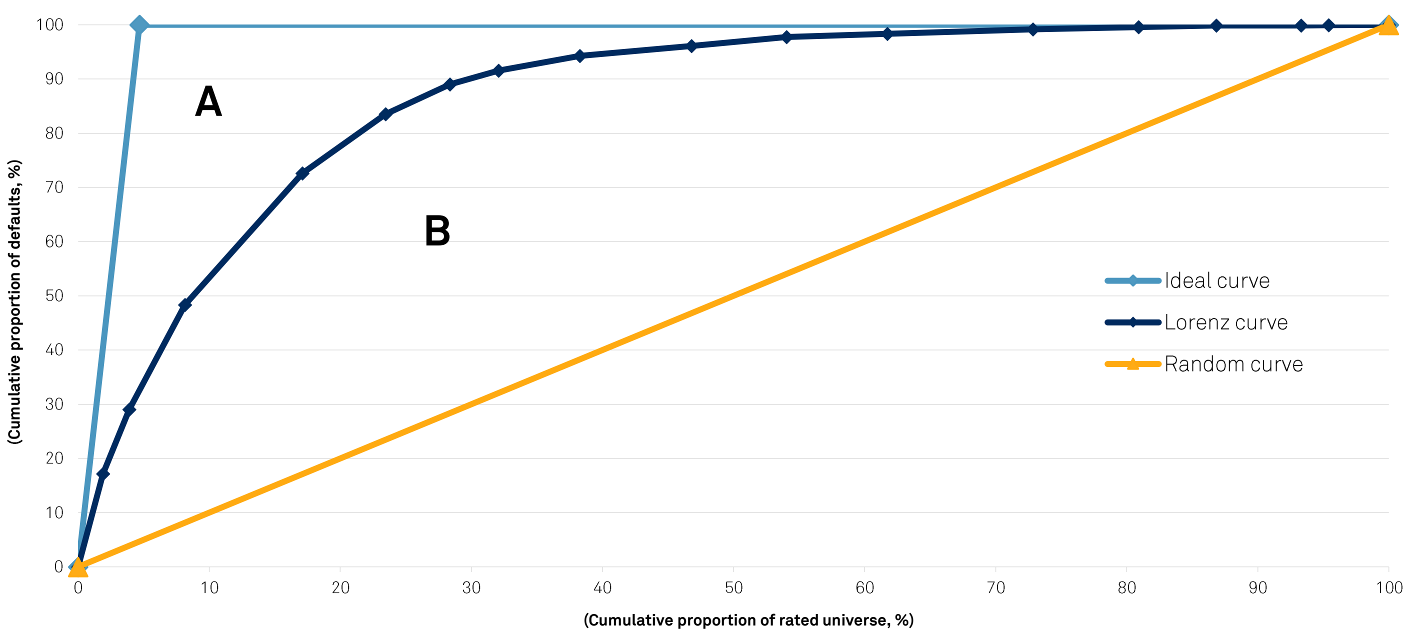
To measure relative ratings performance, we utilize the Lorenz curve as a graphical representation of the proportionality of a distribution, and we summarize this via the Gini coefficient. For this study, the Lorenz curve is plotted with the x-axis showing the cumulative share of issuers, arranged by rating, while the y-axis represents the cumulative share of defaulters, also arranged by rating. For both axes of the Lorenz curve, the observations are ordered from the low end of the ratings scale ('twCCC'/'twC') to the high end ('twAAA').

As an example, if 'twCCC'/'twC' rated entities made up 10% of the total population of issuers at the start of the time frame examined (x-axis) and 50% of the defaulters (y-axis), then the coordinate (10, 50) would be the first point on the curve. If S&P Global Ratings' corporate ratings only randomly approximated default risk, the Lorenz curve would fall along the diagonal. Its Gini coefficient--which is a summary statistic of the Lorenz curve--would thus be zero. If corporate ratings were perfectly rank ordered so that all defaults occurred only among the lowest-rated entities, the curve would capture all of the area above the diagonal on the graph (the ideal curve), and its Gini coefficient would be 1 (see chart 5).

The procedure for calculating the Gini coefficients is illustrated in chart 5: Area B is bounded by the random curve and the Lorenz curve, while area A is bounded by the Lorenz curve and the ideal curve. The Gini coefficient is defined as area B divided by the total of area A plus area B. In other words, the Gini coefficient captures the extent to which actual ratings accuracy diverges from the random scenario and aspires to the ideal scenario.

Chart 5

Sample Lorenz Curve



Related Research

- 2018 Annual Global Corporate Default And Rating Transition Study, www.capitaliq.com, April 9, 2019
- APAC Monthly Snapshots: Asian Manufacturing Recovery Not Imminent, www.capitaliq.com, April 2019
- 2018 Ratings Roundup Report, www.taiwanratings.com - January 7, 2019

The use of the term "methodology" in this article refers to data aggregation and calculation methods used in conducting the research. It does not relate to S&P Global Ratings' methodologies, which are publicly available criteria used to determine credit ratings.

This report does not constitute a rating action.