RATING TRANSITIONS AND DEFAULT RATES 2001-2012

I. Transition Rates for Banks

Transition matrices or credit migration matrices characterise the evolution of credit quality for issuers with the same approximate likelihood of default. They are constructed by mapping the rating history of entities rated by CI into transition probabilities. Hence, transition matrices indicate the probability of a credit rating being upgraded or downgraded, or remaining unchanged, within a specific time period.

Table 1 shows the weighted average one-year transition matrix for long-term foreign currency issuer ratings by broad rating category (i.e. without the modifiers '+' and '-') assigned to banks by CI during the period January 2001-December 2012.

The vertical axis shows the credit rating at the beginning of a period, the horizontal axis the rating one-year later. Credit ratings that do not change between the start and end of the year are captured along the diagonal of the matrix. Movements to the left of the diagonal indicate upgrades of foreign currency ratings and movements to the right indicate downgrades.

Table 1 Average One-Year Transition Rates for Banks, 2001-2012
Rating One Year Later (% of issuers)

Rating From	AAA	AA	A	BBB	BB	B	C	RS	SD	D	Sample Size
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
AA	0.00	95.83	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	144
A	0.00	2.30	93.27	3.92	0.34	0.00	0.00	0.17	0.00	0.00	1,174
BBB	0.00	0.00	4.72	92.01	2.91	0.16	0.00	0.08	0.00	0.12	2,477
BB	0.00	0.00	0.00	9.45	86.63	3.76	0.05	0.10	0.00	0.00	1,915
B	0.00	0.00	0.00	0.00	10.65	88.50	0.43	0.32	0.00	0.11	939
C	0.00	0.00	0.00	0.00	0.00	36.36	63.64	0.00	0.00	0.00	121
RS	0.00	0.00	22.22	11.11	22.22	44.44	0.00	0.00	0.00	0.00	9
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
											6,779

The matrix is diagonally dominant, meaning that most of the probability mass resides along the diagonal. In other words, banks tend to maintain their ratings on a one-year horizon rather than migrating to other ratings. For example, on average, 93.27% of banks rated 'A' at the start of the year were still rated 'A' 12 months later.

Investment grade ratings are more stable than speculative grade ratings. For example, more than 90% of banks rated in the 'AA', 'A' and 'BBB' categories at the beginning of the year were still rated in the same category at the end of the year, whereas the comparable measure for banks rated 'B' and 'C' was 88.50% and 63.64%, respectively.

Upgrades exceed downgrades in most rating categories. For example, on average, 4.72% of 'BBB' banks were raised to a higher rating category (i.e. 'A' and above) while 3.27% were lowered to speculative grade or 'D'.

Tables 2 and 3 show the weighted average migration of banks' long-term foreign currency ratings for three years and five years, respectively.

Table 2 **Average Three-Year Transition Rates for Banks, 2001-2012**
Rating Three Years Later (% of issuers)

Rating From	AAA	AA	A	BBB	BB	B	C	RS	SD	D	Sample Size
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
AA	0.00	96.51	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	86
A	0.00	7.71	79.34	10.39	2.03	0.54	0.00	0.00	0.00	0.00	934
BBB	0.00	0.00	16.14	77.39	5.83	0.59	0.00	0.00	0.00	0.05	1,871
BB	0.00	0.00	0.20	27.58	66.96	5.06	0.13	0.07	0.00	0.00	1,483
B	0.00	0.00	0.00	1.15	32.95	65.13	0.51	0.26	0.00	0.00	780
C	0.00	0.00	0.00	0.00	6.90	84.48	8.62	0.00	0.00	0.00	116
RS	0.00	40.00	20.00	20.00	20.00	0.00	0.00	0.00	0.00	0.00	5
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
											5,275

Table 3 **Average Five-Year Transition Rates for Banks, 2001-2012**
Rating Five Years Later (% of issuers)

Rating From	AAA	AA	A	BBB	BB	B	C	RS	SD	D	Total Number
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
AA	0.00	97.56	2.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41
A	0.00	16.46	68.32	12.11	2.64	0.47	0.00	0.00	0.00	0.00	644
BBB	0.00	0.00	28.82	64.48	5.90	0.80	0.00	0.00	0.00	0.00	1,374
BB	0.00	0.00	2.50	40.82	52.67	3.83	0.00	0.18	0.00	0.00	1,122
B	0.00	0.00	0.16	5.44	48.68	45.26	0.47	0.00	0.00	0.00	643
C	0.00	0.00	0.00	1.79	19.64	77.68	0.89	0.00	0.00	0.00	112
RS	0.00	40.00	20.00	20.00	20.00	0.00	0.00	0.00	0.00	0.00	5
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
											3,941

The matrices indicate that investment grade ratings remain more stable than speculative grade ratings over time. However, the diagonal of the matrix becomes less strong as the horizon increases from one year to three years and from three years to five years; in other words the likelihood of a bank's rating migrating to another rating increases over time, as we might expect. For example, while 92.01% of banks rated in the 'BBB' category retained their rating after one year (Table 1), a lower 64.48% remained in the 'BBB' range after five years (Table 3).

Similar to the one-year transition, a bank is more likely to be upgraded than downgraded over a three- or five-year time span, and the likelihood of a large movement in ratings is low. For example, in the five-year transition shown in Table 3, only 3.11% of credit ratings in the 'A' category fell by more than one rating grade, 0.8% in the 'BBB' category, and 0.18% in the 'BB' category.

II. Upgrade/Downgrade Rates for Banks

Table 4 shows the weighted average one-year upgrade/downgrade rates for long-term foreign currency issuer ratings by rating grade (i.e. including the '+' and '-' modifiers) assigned to banks by CI during the period January 2001-December 2012.

The vertical axis indicates the rating grade at the beginning of the one year period, while the horizontal axis indicates the upgrade, unchanged and downgrade rates, along with the sample size. For example, on average 4.51% of banks rated 'AA-' were downgraded within one year.

Upgrades dominate downgrades for all rating grades, with the exception of 'AA' and 'AA-'. In general, 19.04% out of all 6,779 rating transitions where upgrades while 6.36% were downgrades.

The majority of ratings do not change on a one-year horizon; and investment grade ratings are particularly stable. As might be expected, the lowest unchanged rates are found at sub-investment grades.

Table 4 Average One-Year Upgrade/Downgrade Rates for Banks, 2001-2012

One Year Later (% of issuers)

Rating From	**Upgrades**	**Unchanged**	**Downgrades**	Sample Size
AAA				0
AA+				0
AA	0.00	81.82	18.18	11
AA-	1.50	93.98	4.51	133
A+	16.77	76.40	6.83	161
A	10.82	81.96	7.22	388
A-	12.80	81.28	5.92	625
BBB+	14.68	79.10	6.22	756
BBB	22.42	71.94	5.64	727
BBB-	16.80	77.57	5.63	994
BB+	25.22	70.94	3.83	678
BB	15.77	79.36	4.87	596
BB-	21.06	68.80	10.14	641
B+	26.29	58.29	15.43	350
B	26.61	66.13	7.26	372
B-	24.42	74.65	0.92	217
C+	35.29	64.71	0.00	17
C	37.25	62.75	0.00	102
C-	100.00	0.00	0.00	2
RS	100.00	0.00	0.00	9
SD				0
D				0
Total	19.04	74.60	6.36	6,779

Table 5 shows the upgrade/downgrade rates for 2012. It should be noted that:

In contrast with the "through-the-cycle" average rates presented in Table 4, there were more downgrades than upgrades in almost all rating categories last year. Specifically, of the 272 rating transitions 9.19% were downgrades and 5.51% upgrades, while 85.29% remained unchanged.

Table 5 **Upgrade/Downgrade Rates for Banks, 2012**

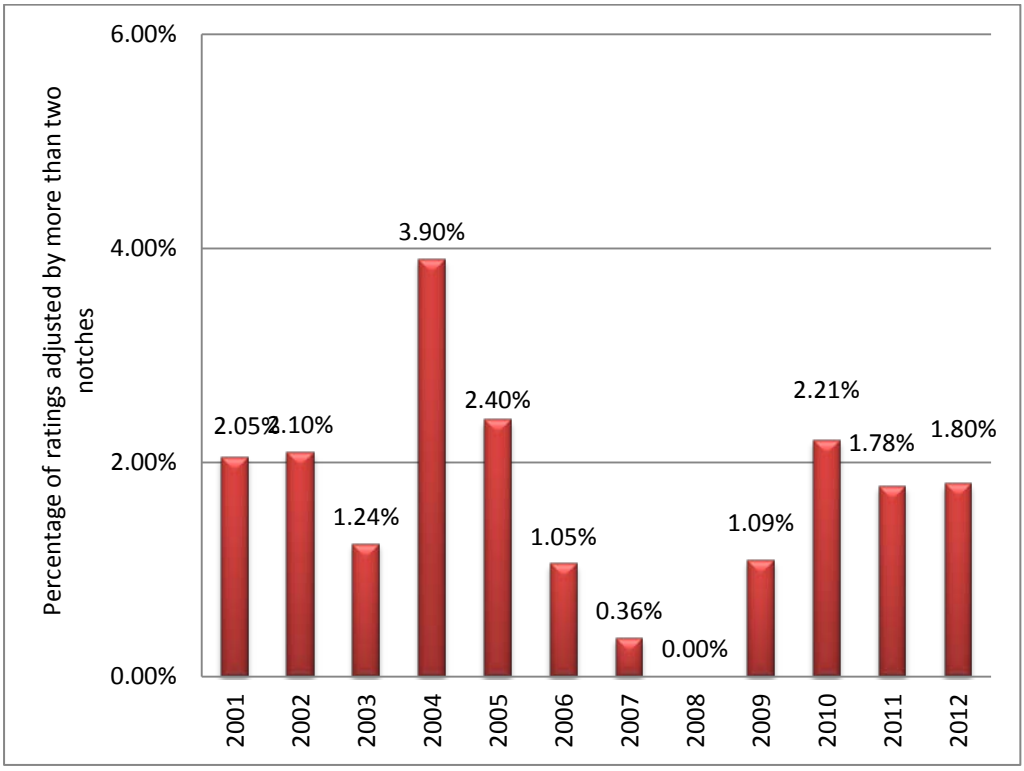
One Year Later (% of issuers)

Rating From	**Upgrades**	**Unchanged**	**Downgrades**	Sample Size
AAA				0
AA+				0
AA	0.00	100.00	0.00	1
AA-	0.00	100.00	0.00	11
A+	0.00	77.78	22.22	9
A	0.00	95.00	5.00	20
A-	9.09	90.91	0.00	22
BBB+	4.55	88.64	6.82	44
BBB	22.73	40.91	36.36	22
BBB-	5.41	78.38	16.22	37
BB+	4.76	80.95	14.29	21
BB	2.17	95.65	2.17	46
BB-	10.00	90.00	0.00	10
B+	9.09	81.82	9.09	11
B	0.00	100.00	0.00	6
B-	0.00	100.00	0.00	12
C+				0
C				0
C-				0
RS				0
SD				0
D				0
Total	5.51	85.29	9.19	272

III. Large Rating Adjustments

The time series for large rating changes, which we define as a rating that is lowered or raised by three or more notches in aggregate during the course of a year, is shown in Figure 1.

Figure 1 Large Rating Adjustments Per Year (as % of Total Bank Ratings)



The frequency of large rating changes increased in 2009-10 from very low levels in 2007-08 as the impact of the global financial crisis was gradually felt in the emerging markets covered by CI. Even so, the proportion of ratings that experienced large adjustments is generally relatively modest at just below 2% in recent years.

IV. Cumulative Default Rates for Banks

Table 6 presents the average cumulative default rates by broad rating category derived from the long-term foreign-currency ratings of banks rated by CI over the period January 2001-December 2012.

Table 6 Average Cumulative Default Rates for Banks, 2001-2012 (%)

Time Horizon (Years)

	1	2	3	4	5	6	7	8	9	10
AAA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AA	0	0	0	0	0	0	0	0	0	0
A	0	0	0	0	0	0	0	0	0	0
BBB	0.2	0.41	0.66	0.9	1.1	1.27	1.46	1.69	1.99	2.41
BB	0.05	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
B	0.31	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
C	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78

N/A= Not Applicable. There are no banks with the respective rating (vertical axis) at the beginning of the corresponding time period (horizontal axis) in the dataset.

Bank ratings show a negative correlation between credit quality and the frequency of default – i.e., the higher the issuer rating, the lower the likelihood of default – in most, but not all, rating categories. For the 'AA' and 'A' categories the default rate is zero (CI has yet to assign a 'AAA' to a bank) while for speculative categories the default rate increases steadily from 'BB' to 'B' to 'C'.

However, the negative correlation is not strong. This is partly due to data limitations as the number of actual defaults is very low, with just five defaults observed during the 12 year period. More importantly, two of the five defaults related to banks rated in the 'BBB' category at the time of default. The ratings 'failure'concerning these two banks is somewhat mitigated by the breakdown of the link between credit risk and financial data as the defaults – which were also indirectly related – appear to have been fraud related.

The default rates derived from CI's universe are quite low and in most cases become constant after a certain number of years due to the absence of any additional reported defaults. For example, the average cumulative default rate for banks rated 'BB' is 0.05% for the first year, it increases to 0.22% for the second year and remains at 0.22% thereafter. This is because there are no banks in CI's dataset that have defaulted on their financial obligations 3-10 years after being assigned a 'BB' range rating.

V. Transition and Default Rates for Corporate Issuers and Sovereigns

Transition rates for corporate issuers (excluding banks) and sovereign governments are recorded in Tables 7, 8, 9, and 10. The tables show that higher credit ratings generally exhibit greater stability than lower ratings.

It should be noted that CI rates substantially fewer sovereigns and corporate issuers compared to banks, and there are some rating grades that have yet to be assigned to any sovereign or corporate. The small sample sizes and relatively low number of migrations from each rating category undermine the accuracy and reliability of the estimated transition rates.

Default rates are similarly affected. Among the population of corporate issuers rated by CI, only two defaults were recorded between 2001 and 2012. For rated sovereigns, just one default was observed over the period. Consequently, cumulative default rates for corporate issuers and sovereigns are not tabulated owing to their limited usefulness.

Table 7 Average One-Year Transition Rates for Corporates, 2001-2012
Rating One Year Later (% of issuers)

Rating From	AAA	AA	A	BBB	BB	B	C	SD	D	Sample Size
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
AA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
A	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	5
BBB	0.00	0.00	2.50	94.17	1.67	0.00	0.83	0.00	0.83	120
BB	0.00	0.00	0.00	11.63	76.74	9.30	0.00	0.00	2.33	43
B	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	8
C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
										176

Table 8 **Average Three-Year Transition Rates for Corporates, 2001-2012**
Rating Three Years Later (% of issuers)

Rating From	AAA	AA	A	BBB	BB	B	C	SD	D	Sample Size
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
AA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
BBB	0.00	0.00	1.41	95.77	1.41	0.00	0.00	0.00	1.41	71
BB	0.00	0.00	0.00	44.83	34.48	20.69	0.00	0.00	0.00	29
B	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	1
C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
										101

Table 9 **Average One-Year Transition Rates for Sovereigns, 2001-2012**
Rating One Year Later (% of issuers)

Rating From	AAA	AA	A	BBB	BB	B	C	SD	D	Sample Size
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
AA	0.00	98.70	1.30	0.00	0.00	0.00	0.00	0.00	0.00	77
A	0.00	5.06	91.98	1.69	1.27	0.00	0.00	0.00	0.00	237
BBB	0.00	0.00	7.69	90.77	1.54	0.00	0.00	0.00	0.00	260
BB	0.00	0.00	0.00	8.11	86.49	5.41	0.00	0.00	0.00	148
B	0.00	0.00	0.00	0.00	7.41	91.67	0.00	0.93	0.00	108
C	0.00	0.00	0.00	0.00	0.00	37.50	62.50	0.00	0.00	16
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
										846

Table 10 **Average Three-Year Transition Rates for Sovereigns, 2001-2012**
Rating Three Years Later (% of issuers)

Rating From	AAA	AA	A	BBB	BB	B	C	SD	D	Sample Size
AAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
AA	0.00	97.96	2.04	0.00	0.00	0.00	0.00	0.00	0.00	49
A	0.00	18.56	73.20	5.15	1.55	1.03	0.00	0.52	0.00	194
BBB	0.00	0.00	26.85	68.52	4.63	0.00	0.00	0.00	0.00	216
BB	0.00	0.00	0.00	26.89	68.07	5.04	0.00	0.00	0.00	119
B	0.00	0.00	0.00	0.00	26.67	73.33	0.00	0.00	0.00	90
C	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	16
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
										684

VI. Upgrade/Downgrade Rates for Corporate Issuers and Sovereigns

The weighted average one-year upgrade/downgrade rates for long-term foreign currency issuer ratings by rating category, including the '+' and '-' modifiers, assigned to corporate issuers and sovereign governments by CI during the 12-year period 2001-2012 are recorded in Tables 11 and 12 respectively.

With regard to corporates (Table 11), downgrade rates are generally higher than upgrade rates for investment grade entities while the opposite trend is observed at speculative grades. With regard to the overall sample, 18.75% of the 176 transitions are upgrades and 15.34% downgrades.

Corporate ratings are more volatile than bank ratings. Almost 66% of corporate ratings are unchanged after one year, whereas the comparable figure for bank ratings is 74.60%. The sample size for corporate is, however, much smaller.

Sovereign ratings are generally stable on a one-year horizon and average one-year upgrade rates are significantly higher than downgrade rates for each rating category (Table12).

Table 11 **Average One-Year Upgrade/Downgrade Rates for Corporates, 2001-2012**

One Year Later (% of issuers)

Rating From	**Upgrades**	**Unchanged**	**Downgrades**	Sample Size
AAA				0
AA+				0
AA				0
AA-				0
A+				0
A	0.00	100.00	0.00	1
A-	0.00	100.00	0.00	4
BBB+	5.00	75.00	20.00	40
BBB	17.95	56.41	25.64	39
BBB-	19.51	75.61	4.88	41
BB+	44.44	22.22	33.33	9
BB	30.00	60.00	10.00	20
BB-	42.86	42.86	14.29	14
B+	0.00	100.00	0.00	8
B				0
B-				0
C+				0
C				0
C-				0
SD				0
D				0
Total	18.75	65.91	15.34	176

Table 12 Average One-Year Upgrade/Downgrade Rates for Sovereigns, 2001-2012
One Year Later (% of issuers)

Rating From	Upgrades	Unchanged	Downgrades	Sample Size
AAA				0
AA+	0.00	100.00	0.00	18
AA	16.67	83.33	0.00	12
AA-	0.00	97.87	2.13	47
A+	19.05	79.37	1.59	63
A	11.11	85.19	3.70	108
A-	21.21	75.76	3.03	66
BBB+	16.07	81.25	2.68	112
BBB	25.00	75.00	0.00	72
BBB-	18.42	76.32	5.26	76
BB+	26.67	62.22	11.11	45
BB	5.00	87.50	7.50	40
BB-	15.87	77.78	6.35	63
B+	16.67	66.67	16.67	36
B	29.27	60.98	9.76	41
B-	25.81	74.19	0.00	31
C+				0
C	37.50	62.50	0.00	16
C-				0
SD				0
D				0
Total	17.26	78.37	4.37	846

VII. Methodology

Methodology for Transition Matrices

CI calculates transition rates by using the cohort approach. Cohorts (or pools) of rated entities with the same long-term foreign currency issuer rating are formed every six months, and the change in the ratings of the entities within each cohort tracked until the end of the chosen time horizon. Ratings that are withdrawn or suspended are excluded from the calculations.

For example, to calculate a one-year transition rate based on 11 years of rating history, we examine the change in an entity's rating between the beginning of January in the first year and the beginning of January in the second year, as well as the change in the rating between the start of July in the first year and the start of the following July. We repeat this exercise for each 12-month period beginning January and July within the overall 11 year timeframe.

The 11 years of rating history can be divided into 21 time horizons of 12 months, starting in January and July each year. A cohort formed at the start of the 11 years can have up to 21 unique one-year transition rates; a cohort formed in the January of the last year would have just one.

The annual average transition rate is the weighted average of these unique rates, where the weight is the relative size of each cohort, i.e. the number of entities in an individual cohort divided by the number of entities in all comparable cohorts (e.g. the number of 'BBB' ratings in January 2001 divided by the total number of 'BBB' ratings measured in January and July of each year from 2001 to 2011). The denominator is referred to in the far-right column of the transition matrices above as 'Sample Size'.

Methodology for Upgrades/Downgrades

Upgrades and downgrades are also calculated based on the cohort approach outlined above. As in the case of transition matrices, ratings that are withdrawn or suspended are excluded from the calculations. Upgrade/downgrade statistics may be considered as a generalized form of rating transitions that focus on whether a rating has been raised or lowered. In contrast the transition matrices reported above capture movements between specific rating categories.

Unlike the transition matrices methodology, the upgrade/downgrade calculations take into account the plus '+' and minus '-' rating modifiers. As a result, a transition from 'BB+' to 'BB' is considered as a downgrade in the downgrade/upgrade calculation but is considered to be stable in the transition matrix calculations.

Upgrade and downgrade rates are presented in tables illustrating upgrade and downgrade rates per rating grade and overall, for specific time periods (i.e. specific years) and for specific time horizons (i.e. average annual, average two year etc) which consider various specific periods of the same length. For example, the total annual average upgrade rate is the weighted average of the 21 total annual upgrade rates calculated for the 21 annual periods in the overall 11-year sample. The weight given to each rate is the ratio of the size of the specific period (size in terms of number of transitions) over the size of all periods.

Methodology for Default Rates

As with transition matrices, cohorts of rated entities with the same credit rating (by broad category) are formed on January 1 and July 1 of each year.

We observe how many members of each cohort default in each six-month period from the time the cohort is formed. For each interval (i.e. up to six months, from seven to 12 months etc), we calculate the marginal default rate, which measures the frequency of default during each interval from cohort formation. The marginal default rate is the number of defaults divided by the size of the cohort at the beginning of each period, adjusted for any defaults or rating withdrawals in the previous period.

We then find the weighted-average marginal default rate of all cohorts belonging to the same rating category, using the number of entities in each cohort as a weight. Hence, the average marginal default rate takes into account the experience of cohorts of similarly rated entities over the same time interval from cohort formation, but in different years. For example, the one-period marginal default rate for the 'BBB' rating category, based on ratings data from 2001-2011, will take into account the six-month default record of the 'BBB' cohort formed in January 2001 and the six-month default record of the 'BBB' cohort formed in July 2011, and of all other 'BBB' cohorts formed in between those dates.

We use this information to calculate the average cumulative default rate, which measures the probability of default at any time over a given time horizon (one year, three years, five years etc).

The average cumulative probability of defaulting up to one year, for example, is equal to the weighted-average marginal default rate for 0-6 months, plus the product of the weighted-average marginal default rate for 7-12 months and the average proportion of entities in the cohort who did not default in the previous six-month period (i.e. the weighted-average marginal survival rate).

The use of average marginal default rates enables us to utilize all available rating history – for example, the calculation of the five-year average cumulative default rate is not based solely on entities that CI has rated for at least five years, rather it draws on all entities that have been rated for at least six months. An entity may also belong to more than one cohort if its credit rating migrates to other grades over time.

Limitations of Default Rates

It is important to note that the default rates referred to above reflect the actual default record of entities rated by CI in the period 2001-2012. The default rates are not estimates of the future probability of default.

Data source

The dataset for this report comprises all public ratings assigned by CI to banks, corporate issuers and sovereigns between 1st January 2001 and 1st January 2013. The credit rating tracked is the long-term foreign currency issuer rating. The rating modifiers '+' and '-' are considered in the calculations of upgrade and downgrade rates but they are excluded in the calculations of transition matrices and default rates.