CRISIL Default Study 2014

CRISIL Annual Default and
Ratings Transition Study - 2014

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Box 1: Meaning and Significance of Default Rates, Default Definition, and Method of Computation

Default Rates

What are default rates?

The default rate for a specified period is the number of defaults among rated firms during the period, expressed as a percentage of the total number of firms with outstanding ratings throughout the period. Default rates can be calculated at each rating level, and can be calculated over multiple periods.

What are transition rates?

A transition rate measures the instances of change in credit rating over a specified period. Transition rates can be calculated for the entire rated population or for a specified rating level.

How are default and transition rates used?

For all debt market participants, accurate and reliable default and transition rates are critical inputs in formulating the following decisions:

a) Pricing debt

Default and transition rates are critical inputs for pricing a debt instrument or loan exposure. Default probabilities associated with ratings help investors and lenders quantify credit risk in their debt exposures, and provide inputs on whether and how much to lend, and at what price.

b) Structuring and pricing credit-enhanced instruments

The structuring, rating, and pricing of credit-enhanced instruments depend heavily on the default and transition rates of underlying borrowers and securities.

c) Measuring credit risk

Default and transition rates are key inputs for many quantitative risk assessment models. Investors in rated instruments can manage their risk exposures effectively if they have access to reliable default and transition rates. Transition rates are also important for debt funds that need to maintain a certain threshold of credit quality in their portfolios, and for investors who are, because of regulations or otherwise, mandated to invest only in securities that are rated at a certain level or above.

d) Indicating efficacy of rating scale

CRISIL's credit ratings are an indicator of probability of default. If ratings are reliable, the default rates should decrease as one moves up the rating scale. Default and transition rates can therefore be used to validate rating scales and quantify rating stability.

Key Variables for Default Rate Computation

(i) Definition of default

For the purpose of computing default rates, there needs to be a clear definition of default. CRISIL defines default as any missed payment on a rated instrument. This means that if a rated debt obligation is not serviced in full by the due date, the rating moves to 'CRISIL D' or an equivalent. Furthermore, as CRISIL's credit ratings are an opinion on the timely repayment of debt, any post-default recovery is not factored into CRISIL's credit ratings. CRISIL believes that such an objective definition of default and its consistent application over time provide a strong foundation for the meaningful third-party use of its default rates. Thus, **CRISIL's default rates are free from default recognition bias.**

(ii) Period of computation

Default rates can be computed over varying timeframes, potentially exposing such computation to period selection bias. For example, if default rates were published over a period of economic strength, they would appear to be artificially low, and hence, would be of limited use to market participants. CRISIL publishes its default rates from inception to date, ensuring that they are **free from period selection bias.**

(iii) Computation methodology

Default rates can be computed using different methodologies. Each methodology has implications for the numeric outcome as explained in Table A13. CRISIL's default rates are computed using the Annual Average Cumulative Default Rate approach, using the weighted annual marginal default rate methodology, with full year-withdrawal adjustments as explained in Annexure 5.
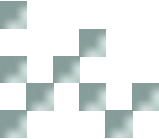
A 'normalisation' of the above variables must precede any comparison of default statistics across rating agencies.

What is unique about CRISIL's Default and Ratings Transition Study?

CRISIL's default and rating transition study incorporates all global best practices in the computation of default rates. These include a digital definition of default, elimination of period selection bias, application of globally accepted marginal default rate method, and use of monthly frequency static pools as base data. In fact, CRISIL is India's only rating agency to use monthly static pools in computing default and transition rates. This rigorous method of computing default rates significantly enhances the study's ability to capture defaults and rating changes that have occurred during the year.

Moreover, CRISIL's default and transition statistics adequately represent the default characteristics of companies across sectors and industries. The study includes ratings assigned by CRISIL since its inception in 1987. The dataset is the largest and most comprehensive in the Indian debt market as it takes into account more than one full economic cycle.

In addition to the performance of CRISIL ratings since inception, the study also presents the default and transition statistics for the past 10 years to give a picture of the more recent rating performance. This addresses the views of many investors and policy makers that the huge surge seen in default rates in the late 1990s was because of structural changes in the Indian economy and is unlikely to recur, and hence, default rates in recent years would be more representative of the prevailing credit environment. CRISIL believes it is important to present both, the default rates for the recent period as well as since inception, to help stakeholders form an opinion on the default behaviour of the ratings and enable them to make an informed decision.

CRISIL Annual Default and Ratings Transition Study – 2014

Executive summary

In 2014, 378 CRISIL-rated firms defaulted, the highest for any year (346 in 2013), and the overall annual default rate stood at 4.4 per cent. The increasing incidence of defaults and continually high default rates are attributable to a significant increase in the number of firms in the 'CRISIL BB' and lower rating categories in recent years. Of over 12,500 firms with outstanding ratings in CRISIL's portfolio as on December 31, 2014, more than three-fourths had ratings of 'CRISIL BB' or lower, as compared with one-fifth of 900 firms with outstanding ratings as on December 31, 2008. The high default rate is also driven by the continued credit quality pressures on corporate India during 2014. It is pertinent to note that although the default rates in 2014 were high, they were lower than the historical highs witnessed between 1998 and 2001. Hence, the average default rates of long-term ratings declined.

Key highlights of CRISIL's latest study are:

- The average default rates of long-term ratings for 1988-2014 decreased as compared with 1988-2013

- CRISIL's long-period average default rates continue to exhibit ordinality across all rating categories - higher rating categories have lower default rates

- Not a single long-term instrument rated 'CRISIL AAA' has ever defaulted

- The overall annual default rate in 2014, at 4.4 per cent, was at a similar level as in 2013, and remains high

- The stability rates of long-term ratings have continued to strengthen over the years – the overall stability rate across ratings was high, at 87 per cent, between 1988 and 2014

- The stability rates for short-term instruments remain strong across rating categories

- CRISIL's ratings on structured finance instruments witnessed no default in 2014 – hence, the average default rates of structured finance instruments declined across rating categories

I. CRISIL's Rating Distribution

CRISIL had outstanding long-term ratings on more than 12,500 firms as on December 31, 2014, up from around 900 as on December 31, 2008. The expansion in portfolio has been accompanied by changes in CRISIL's rating distribution, with an increasing number of ratings assigned in lower rating categories. As on December 31, 2014, more than 75 per cent of ratings were either 'CRISIL BB' or lower, as against 20 per cent six years ago. Consequently, CRISIL's rating distribution has altered significantly – the median rating has been stable at the 'CRISIL BB' category over the past five years; the median rating was at 'CRISIL BBB' as on December 31, 2008 (refer to Chart 1).

Chart 1: CRISIL's rating distribution
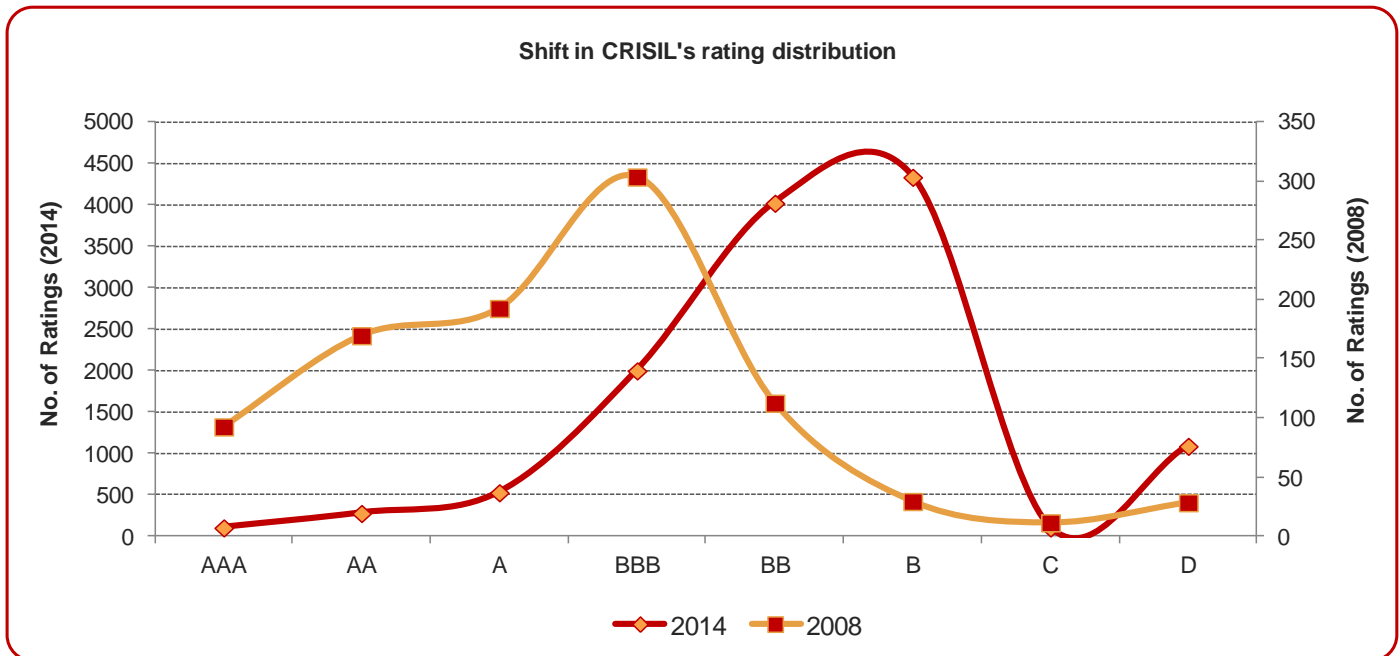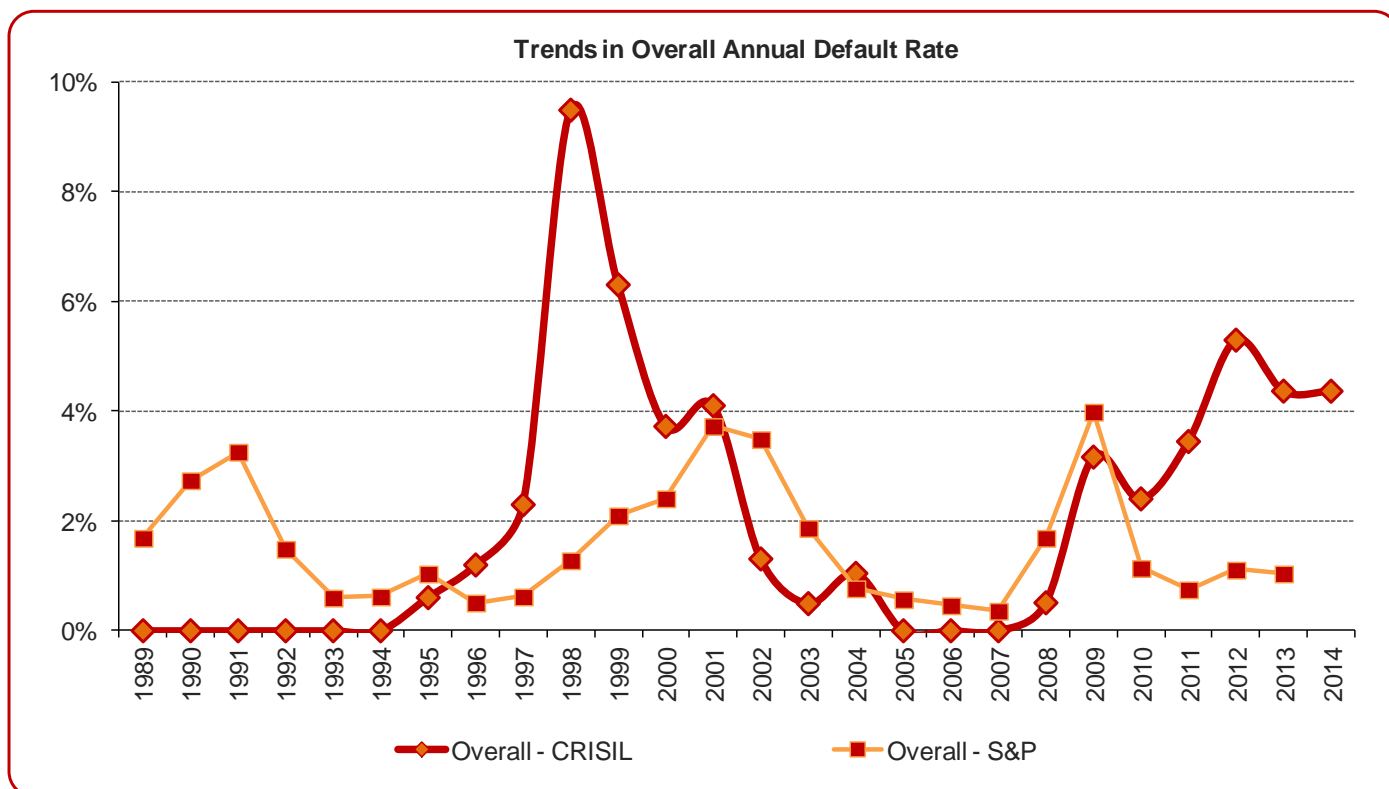

Source: CRISIL Ratings

II. Movements in Overall Annual Default Rates Since Inception

Annual default rate for corporate issuers[1] remains high

Default rates have to be both low and stable over a given time horizon to be usefully factored for pricing debt. Chart 2 indicates the trend for CRISIL's annual default rate (the proportion of total defaults by issuers carrying a long-term rating in a particular year to total non-default long term ratings outstanding during the year).

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[1] 'Corporate issuers' is a generic term used here to refer to various types of firms that have availed long term ratings from CRISIL and form a part of the Default Study. The term includes companies, both public and private limited, societies, partnerships, proprietorship, and trusts, across the manufacturing, financial, and infrastructure sectors.

Chart 2: Overall Annual Default Rates

Source: CRISIL Ratings

The default rate, at 4.4 per cent in 2014, is at a similar level as in the previous year, and remains high. The high default rate reflects the sharp increase in ratings in the lower rating categories *(refer to Chart 1)*, which have traditionally been more susceptible to defaults, as well as the continued credit quality pressures on corporate India in the year.

III. For Corporate Issuers

One-year, two-year, and three-year CDRs

As credit ratings are opinions on default risk, the higher the rating, the lower the probability of default should be. The inverse correlation between credit ratings and default probabilities is desirable for rating agencies and is called the test of ordinality. Table 1 shows CRISIL's one-, two-, and three-year withdrawal-adjusted CDRs across different rating categories from 1988 to December 2014 (*refer to Annexure 5 for methodology used in calculation of default rates*). CRISIL's default rates continue to be ordinal. Notably, not a single long-term instrument rated 'CRISIL AAA' has ever defaulted.

Table 1: CRISIL's average CDRs for long-term ratings (withdrawal-adjusted)

One-, Two-, and Three-Year CDRs, between 1988 and 2014				
Rating	**Issuer-months**	**One-Year**	**Two-Year**	**Three-Year**
CRISIL AAA	15352	0.00%	0.00%	0.00%
CRISIL AA	33476	0.03%	0.30%	0.85%
CRISIL A	41915	0.63%	2.62%	5.43%
CRISIL BBB	81429	1.26%	3.40%	6.73%
CRISIL BB	111064	4.60%	9.55%	14.35%
CRISIL B	91303	8.27%	17.00%	23.38%
CRISIL C	5929	19.94%	32.52%	40.78%
Total	**380468**			

Source: CRISIL Ratings

Average default rates for 1988-2014 were lower than that for 1988-2013. The average default rates for the past 10 years (2004-2014), indicating rating behaviour over more recent periods, are presented in Table A3 in Annexure 3. These default rates are also ordinal.

One-year transition rates for ratings on both long-term scale and short-term scale

Transition rates indicate the instances of a given rating migrating to other rating categories. As credit ratings drive bond yields, and therefore, their prices, transition rates are relevant for investors who do not intend to hold debt instruments to maturity or need to mark their investments to market regularly. Additionally, they are of crucial importance for investors who are mandated to only hold investments that are of a certain minimum credit quality. Table 2 presents CRISIL's transition rates for various rating categories.

Table 2: CRISIL's average one-year transition rates for long-term ratings

Rating	Issuer-months	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB	CRISIL BB	CRISIL B	CRISIL C	CRISIL D
	One-year average transition rates: between 1988 and 2014								
CRISIL AAA	15352	97.28%	2.72%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	33476	1.41%	92.96%	4.78%	0.58%	0.19%	0.03%	0.02%	0.03%
CRISIL A	41915	0.00%	3.31%	87.79%	5.95%	1.88%	0.15%	0.30%	0.63%
CRISIL BBB	81429	0.00%	0.05%	2.51%	87.58%	7.70%	0.56%	0.34%	1.26%
CRISIL BB	111064	0.00%	0.02%	0.01%	3.46%	87.33%	3.95%	0.64%	4.60%
CRISIL B	91303	0.00%	0.00%	0.01%	0.06%	6.64%	84.43%	0.59%	8.27%
CRISIL C	5929	0.00%	0.00%	0.00%	0.20%	1.84%	15.96%	62.07%	19.94%
Total	380468								

Source: CRISIL Ratings

The highlighted diagonal of Table 2 indicates the stability rates of various rating categories. As can be seen, between 1988 and 2014, around 93.0 per cent of the ratings in the 'CRISIL AA' category remained in that category at the end of one year; 1.4 per cent was upgraded to a higher rating ('CRISIL AAA'), and 5.6 per cent was downgraded to a lower rating.

As with CRISIL's default rates, CRISIL's one-year transition rates are also comprehensive and reliable because they have been compiled using monthly static pools that cover data since the first rating was assigned by CRISIL and include multiple business cycles. CRISIL also publishes the one-year transition rates of the past 10 years (2004-2014). These are presented in Table A6 in Annexure 3; *for transition rates based on the annual static pools methodology, refer to Tables A7 and A8 in Annexure 3*.

Table 3 provides the one-year transition rates for CRISIL's short-term ratings. The diagonal displays the stability rates for each rating. The numbers to the left of the diagonal represent the proportion of upgrades, while that to the right represent the proportion of downgrades. The stability rate for the 'CRISIL A1+' rating is around 97 per cent over one year, and the 'CRISIL A1' rating has almost 9.7 per cent rate of transition to a higher rating ('CRISIL A1+') over one year.

Table 3: CRISIL's average one-year transition rates for short-term ratings

Rating*	Issuer-months	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
	One-year average transition rates: between 1988- 2014						
CRISIL A1+	60386	97.12%	2.30%	0.33%	0.23%	0.02%	0.00%
CRISIL A1	15357	9.65%	83.69%	4.73%	0.85%	0.44%	0.65%
CRISIL A2	23746	0.26%	4.35%	86.12%	6.48%	1.92%	0.88%
CRISIL A3	45251	0.00%	0.06%	3.79%	85.28%	9.87%	1.01%
CRISIL A4	131737	0.00%	0.01%	0.02%	2.00%	92.56%	5.42%
Total	276477						

*CRISIL A2, CRISIL A3, and CRISIL A4 include ratings of the respective modifier levels.

Source: CRISIL Ratings

'CRISIL A1' and 'CRISIL A2' ratings show stability of 83.7 per cent and 86.1 per cent, respectively. The stability rates for 'CRISIL A1' were higher during the more recent period between 2004 and 2014 as against the entire 27-year rating history of CRISIL (refer to Table A9 in Annexure 3); *for transition rates based on the annual static pools methodology, refer to Tables A10 and A11 in Annexure 3*.

Movement in stability rates over the past four years

Stability rates indicate the proportion of ratings remaining unchanged over a given time horizon. The stability of CRISIL's ratings increases with movement up the rating scale; in other words, stability rates of CRISIL's ratings are also ordinal. Table 4 shows CRISIL's one-year stability rates over the past 27 years. The stability rate for 'CRISIL A' has increased to 87.8 per cent for 1988-2014 from 87.1 per cent for 1988-2013.

Table 4 and 5: Stability rates of CRISIL's long-term ratings

Table 4: One-year average stability rates since 1988				
Period	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB
1988-2014	**97.3%**	**93.0%**	**87.8%**	**87.6%**
1988-2013	97.1%	92.6%	87.1%	87.4%
1988-2012	97.0%	92.3%	86.7%	87.0%
1988-2011	96.8%	91.9%	85.7%	85.8%

Source: CRISIL Ratings

Table 5: One-year average stability rates for various 10-year periods				
Period	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB
2004-2014	**97.9%**	**95.4%**	**91.2%**	**89.1%**
2003-2013	97.8%	95.2%	91.0%	89.3%
2002-2012	97.9%	95.2%	91.4%	89.6%
2001-2011	97.5%	95.1%	90.7%	89.8%

Source: CRISIL Ratings

Table 5 shows the one-year stability rates at individual rating levels for various 10-year periods. The stability rates for 'CRISIL AAA' and 'CRISIL AA' ratings have been consistently above 97 and 95 per cent, respectively. 'CRISIL A' and 'CRISIL BBB' ratings have also displayed high stability rates.

IV. For Structured Finance Instruments

CRISIL was the pioneer in rating several complex structured finance instruments in the Indian market. CRISIL's data set comprises **4962 issue years,** including 2638 issue years for retail asset-backed securities (ABS) and retail mortgage-backed securities (MBS) spanning over 20 years. CRISIL has outstanding ratings on a variety of structured finance instruments; in addition to ABS and MBS instruments, these include instruments backed by full or partial guarantee.

One-, two-, and three-year CDRs

Table 6 provides the one-, two-, and three-year average CDRs for each rating category between 1993[2] and 2014; *refer to Table A12 in Annexure 3 for default rates between 2004 and 2014*.

Table 6: CRISIL's average CDRs for ratings on structured finance instruments (between 1993 and 2014)

One-, Two-, and Three-Year CDRs, between 1993 and 2014				
Rating	Issue-Years	One-Year	Two-Year	Three-Year
CRISIL AAA(SO)	3150	0.03%	0.13%	0.21%
CRISIL AA(SO)	669	0.15%	0.38%	0.72%
CRISIL A(SO)	727	0.28%	1.50%	3.15%
CRISIL BBB(SO)	360	0.28%	1.66%	1.66%
CRISIL BB(SO) and below	56	21.43%	28.26%	28.26%
Total	4962			

Source: CRISIL Ratings

The one-year CDR for instruments rated 'CRISIL AAA (SO)' is 0.03 per cent. This is on account of a central-government-guaranteed 'CRISIL AAA (SO)'-rated instrument that defaulted in 2005 because the trustee delayed the invocation of the guarantee, resulting in a delay in payments to investors; under its rigorous default recognition norms, CRISIL treated this as a default. This default was subsequently cured, the investors were paid in full, and the rated instrument was redeemed.

One-year transition rates

Around 63 per cent of all structured finance ratings—3150 of 4962 issue years—are rated 'CRISIL AAA (SO)' and show a high stability rate of over 98 per cent. Table 7 shows the one-year average transition rates between 1993 and 2014 for structured finance instruments.

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[2] CRISIL assigned its first structured finance rating in January 1992, which forms a part of the 1993 annual static pool. For calculating default and transition rates for structured finance ratings, CRISIL has used annual static pool methodology as defaults in structured finance securities have been rare.

Table 7: CRISIL's average one-year transition rates for structured finance instruments

Rating	Issue-years	CRISIL AAA(SO)	CRISIL AA(SO)	CRISIL A(SO)	CRISIL BBB(SO)	CRISIL BB(SO)	CRISIL B(SO)	CRISIL C(SO)	CRISIL D(SO)
One year Average Transition Rates - 1993 – 2014									
CRISIL AAA(SO)	3150	98.25%	1.52%	0.16%	0.00%	0.00%	0.00%	0.03%	0.03%
CRISIL AA(SO)	669	5.53%	90.58%	3.59%	0.15%	0.00%	0.00%	0.00%	0.15%
CRISIL A(SO)	727	0.96%	4.54%	90.65%	1.10%	2.34%	0.14%	0.00%	0.28%
CRISIL BBB(SO)	360	3.06%	2.50%	12.50%	80.56%	0.56%	0.28%	0.28%	0.28%
CRISIL BB(SO)	48	2.08%	4.17%	8.33%	18.75%	50.00%	0.00%	0.00%	16.67%
CRISIL B(SO)	6	0.00%	0.00%	0.00%	0.00%	0.00%	66.67%	0.00%	33.33%
CRISIL C(SO)	2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Total	4962								

Source: CRISIL Ratings

The highlighted diagonal in Table 7 shows the stability rates for various rating categories.

Movements in stability rates over the past four years

Tables 8 and 9 present the one-year stability rates of structured finance ratings for different periods.

Table 8: One-Year Stability Rates Since 1993				
Period	CRISIL AAA(SO)	CRISIL AA(SO)	CRISIL A(SO)	CRISIL BBB(SO)
1993-2014	**98.3%**	**90.6%**	**90.6%**	**80.6%**
1993-2013	98.2%	89.6%	90.1%	77.2%
1993-2012	98.1%	88.9%	90.9%	79.0%
1993-2011	97.9%	87.7%	90.6%	82.5%

Source: CRISIL Ratings

Table 9: One-Year Stability Rates for various 10-year periods				
Period	CRISIL AAA(SO)	CRISIL AA(SO)	CRISIL A(SO)	CRISIL BBB(SO)
2004-2014	**98.4%**	**91.8%**	**89.0%**	**80.8%**
2003-2013	98.3%	90.8%	89.1%	77.4%
2002-2012	98.2%	89.7%	91.2%	79.1%
2001-2011	98.1%	89.0%	90.5%	83.2%

Source: CRISIL Ratings

These stability rates are high; however, the Indian securitisation market has been 'CRISIL AAA (SO)'-centric, as reflected in the large number of issue years for this rating. There has been a recent improvement in data density in the other high rating categories up to 'CRISIL BBB (SO)', largely explaining a move towards ordinality in stability rates.

V. Retail ABS and MBS Issuances' One-Year Transition Rates

CRISIL's database of retail ABS and MBS transactions consists of 2638 issue years across 22 years (1993 -2014). 2011 witnessed the first-ever default among CRISIL-rated ABS instruments, with defaults in two CRISIL-rated ABS pools. However, investors continued to receive payments and their losses were small.

Table 10 shows the transition rates for ABS and MBS ratings for the period between 1993 and 2014. 'CRISIL AAA (SO)'-rated ABS or MBS instruments, which account for more than 80 per cent of the ratings in the database, have stability rate of 98.2 per cent.

Table 10: CRISIL's average one-year transition rates for ABS and MBS ratings

Rating	Issue-years	One-year average transition rates between 1993 and 2014							
		CRISIL AAA(SO)	CRISIL AA(SO)	CRISIL A(SO)	CRISIL BBB(SO)	CRISIL BB(SO)	CRISIL B(SO)	CRISIL C(SO)	CRISIL D(SO)
CRISIL AAA(SO)	2144	98.23%	1.54%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA(SO)	135	17.04%	78.52%	3.70%	0.74%	0.00%	0.00%	0.00%	0.00%
CRISIL A(SO)	73	9.59%	15.07%	71.23%	4.11%	0.00%	0.00%	0.00%	0.00%
CRISIL BBB(SO)	274	4.02%	3.29%	15.69%	76.28%	0.00%	0.37%	0.37%	0.00%
CRISIL BB(SO)	9	11.11%	22.22%	22.22%	22.22%	22.22%	0.00%	0.00%	0.00%
CRISIL B(SO)	2	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	50.00%
CRISIL C(SO)	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Total	2638								

Source: CRISIL Ratings

The stability rate of the 'CRISIL AAA (SO)' rating category is comparable with that of the 'CRISIL AAA' rating. Data density is sparse below 'CRISIL AAA (SO)', largely explaining the non-ordinal stability rates below that rating category. Furthermore, a significant number of 'CRISIL AA (SO)' and 'CRISIL A (SO)' rated instruments have performed well, resulting in upgrades.

Conclusion:

The overall annual default rate remained high in 2014 because of a change in rating composition resulting from a surge in the number of firms in the lower rating categories and the continued credit quality pressures on corporate India in the year. However, the default rates in 2014 were lower than the historical highs witnessed in 1998-2001, leading to a general decline in the average default rates across rating categories for 1988-2014 vis-à-vis 1988-2013.

The strength of CRISIL's rating process is demonstrated by the ordinal nature of default rates and high stability of CRISIL's ratings. These processes have been set up, stabilised, and refined over the two decades of CRISIL's rating experience. Their robustness is today recognised by issuers and investors. This study is based on CRISIL's ratings assigned over more than 27 years, covering multiple credit cycles. Because of the quality, vintage, and diversity of the instruments, the size of the database, and use of monthly static pool methodology, this remains the most comprehensive study on corporate defaults and rating transitions in India.

VI. Annexures

Annexure 1: Industry-wise Classification of Defaults

CRISIL is the first rating agency in India to publish industry-wise classification and a chronological account of all the defaults in its portfolio that form part of the static pools used for computing default rates. Since CRISIL's inception, there have been 1467 defaults by issuers carrying a long-term rating. Over the past 27 years, five industries (textile, metal and mining, distributors, food products, and construction and engineering) accounted for around 46 per cent of these defaults, as shown in Table A1.

Table A1: Industry-wise and chronological break-up of defaults on long-term instruments over the past 27 years

Industry	1988 to 1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Sum
Textiles- Apparel & Luxury Goods		1	1	3	1	3	1	1		1					3	8	12	26	50	45	53	209
Metals & Mining			2	1	6	2	2	2			1					2	6	28	34	31	23	140
Distributors																1	3	6	31	35	45	121
Food Products				1	2	3					1					3	6	7	23	30	44	120
Construction & Engineering					1			1								3	4	4	16	21	28	78
Machinery					2	2	1									3	3	6	17	19	18	71
Real Estate Development						1		1								1	2	4	7	14	35	65
Diversified Consumer Services																1	1	8	10	22	11	53
Hotels Restaurants & Leisure						1										2	5	7	16	10	8	49
Pharmaceuticals			1		1	2		1								4	2	5	7	4	13	40
Construction Materials			1		2	2	1		1							2	1	3	8	12	5	38
Containers & Packaging					2	1										1	3	1	13	10	6	37
Electrical Equipment					1	1											2	7	6	11	9	37
Auto Components			1		1	1		1								1	1	2	11	9	6	34
Specialty Retail																	2	8	11	13		34
Independent Power Producers & Energy Traders								1						1		1	3	4	7	10	6	33
Paper & Forest Products				1	1	1								1		1	5	4	4	6	4	28
Chemicals				1	2	2	3	3	1								1	1	6	3	4	27
Household Durables		1	1		3					1						3		1	5	2	4	21
Non Banking Financial Company				4	12	2											2					20
Electronic Equipment Instruments & Components							1									1		4	1	2	8	17
Road & Rail				1													5	4	3	4		17
Beverages																	1	4	5	3	3	16
Building Products															1		2	9	1		3	16
Commercial Services & Supplies						1										3		1	5	2	4	16
Transportation Infrastructure																1	2		4	5	4	16
Health Care Providers & Services																	1	2	4	4	2	13
Media					1												1	5	2	4		13
Oil Gas & Consumable Fuels																	1		6	2		9
Others	0	0	0	1	8	2	2	0	0	0	1	0	0	0	0	1	3	14	19	17	11	79
Total Defaults	0	2	7	13	45	27	12	11	3	1	3	0	0	0	6	43	68	161	341	346	378	1467
Outstanding ratings at year ending December 31	353#	466	607	592	526	507	420	355	317	274	244	230	226	231	943	3002	5178	7525	10588	11699	12500	
Overall Annual Default Rate**	0.0%	0.6%	1.2%	2.3%	9.5%	6.3%	3.7%	4.1%	1.3%	0.5%	1.0%	0.0%	0.0%	0.0%	0.5%	3.2%	2.3%	3.5%	5.3%	4.4%	4.4%	

** The proportion of total defaults in a particular year to total non-default ratings outstanding at the beginning of the year (adjusted for withdrawals)
# Outstanding ratings at year ending December 31, 1994
Source: CRISIL Ratings

The highest number of defaults, in absolute terms, since inception, was reported in 2014. However, it should be noted that these defaults were on a much higher base of around 12,500 outstanding ratings. Moreover, there has been an increase in the number of firms in the lower rating categories, which have traditionally been more susceptible to defaults. The large number of defaults between 1997 and 1999 was because of several factors, including economic slowdown and structural/regulatory changes, especially in the financial sector. Textiles had the largest number of defaults in 2014, in line with past trends, as their high leverage makes them more vulnerable to economic cycles.

Annexure 2: Analysis of Defaults: Time to Default

Higher ratings farther away from default

An analysis of the 1467 defaults (refer to Table A1) indicates that the higher-rated firms were farther away from a default in terms of the number of months prior to default than lower-rated firms. While issuers rated in the 'CRISIL B' or 'CRISIL C' categories that defaulted did so in about 13 months on an average, the few firms that defaulted from higher categories did so after a much longer period.

Table A2: Average Time to Default (of Defaulted Firms) (In number of months)	
Rating Category	**Months to Default**
CRISIL AAA	No Defaults
CRISIL AA	57
CRISIL A	42
CRISIL BBB	30
CRISIL BB	17
CRISIL B	13
CRISIL C	13

Source: CRISIL Ratings

Annexure 3: Comparative Default and Transition Rates for different periods

Three-year CDRs for long-term ratings – monthly static pools

Table A3: One-, Two-, and Three-Year CDRs, between 2004 and 2014				
Rating	**Issuer-months**	**One-Year**	**Two-Year**	**Three-Year**
CRISIL AAA	9361	0.00%	0.00%	0.00%
CRISIL AA	18311	0.00%	0.03%	0.17%
CRISIL A	25930	0.29%	1.25%	2.44%
CRISIL BBB	74641	1.00%	2.61%	5.21%
CRISIL BB	107804	4.18%	8.93%	13.47%
CRISIL B	90795	8.22%	16.84%	23.08%
CRISIL C	5061	17.74%	28.77%	36.11%
Total	331903			

Source: CRISIL Ratings

Three-year CDRs for long-term ratings – annual static pools

Table A4: One-, Two-, and Three-Year CDRs, between 1988 and 2014				
Rating	Issuer-years	One-Year	Two-Year	Three-Year
CRISIL AAA	1326	0.00%	0.00%	0.00%
CRISIL AA	2885	0.00%	0.20%	0.73%
CRISIL A	3699	0.43%	2.36%	4.91%
CRISIL BBB	7374	1.15%	3.06%	6.15%
CRISIL BB	10525	4.53%	9.26%	13.91%
CRISIL B	8855	8.17%	16.23%	21.98%
CRISIL C	523	19.50%	32.26%	42.32%
Total	35187			

Source: CRISIL Ratings

Table A5: One-, Two-, and Three-Year CDRs, between 2004 and 2014				
Rating	Issuer-years	One-Year	Two-Year	Three-Year
CRISIL AAA	852	0.00%	0.00%	0.00%
CRISIL AA	1677	0.00%	0.00%	0.10%
CRISIL A	2371	0.17%	1.12%	2.14%
CRISIL BBB	6816	0.95%	2.38%	4.76%
CRISIL BB	10243	4.12%	8.62%	13.10%
CRISIL B	8814	8.10%	16.07%	21.74%
CRISIL C	449	17.37%	28.87%	37.68%
Total	31222			

Source: CRISIL Ratings

One-year transition rates for long-term ratings – monthly static pools

Table A6: One-year average transition rates: between 2004 and 2014									
Rating	Issuer- months	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB	CRISIL BB	CRISIL B	CRISIL C	CRISIL D
CRISIL AAA	9361	97.85%	2.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	18311	0.88%	95.43%	3.06%	0.63%	0.00%	0.00%	0.00%	0.00%
CRISIL A	25930	0.00%	3.05%	91.18%	4.96%	0.37%	0.06%	0.08%	0.29%
CRISIL BBB	74641	0.00%	0.00%	2.19%	89.06%	7.22%	0.36%	0.16%	1.00%
CRISIL BB	107804	0.00%	0.00%	0.01%	3.49%	87.90%	3.98%	0.44%	4.18%
CRISIL B	90795	0.00%	0.00%	0.01%	0.05%	6.67%	84.49%	0.56%	8.22%
CRISIL C	5061	0.00%	0.00%	0.00%	0.00%	2.15%	18.69%	61.41%	17.74%
Total	331903								

Source: CRISIL Ratings

One-year transition rates for long-term ratings – annual static pools

Table A7: One-year average transition rates: between 1988 and 2014									
Rating	Issuer- years	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB	CRISIL BB	CRISIL B	CRISIL C	CRISIL D
CRISIL AAA	1326	97.29%	2.72%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	2885	1.49%	92.89%	4.71%	0.69%	0.14%	0.07%	0.00%	0.00%
CRISIL A	3699	0.00%	3.22%	88.19%	5.79%	1.95%	0.11%	0.32%	0.43%
CRISIL BBB	7374	0.00%	0.04%	2.58%	87.92%	7.40%	0.52%	0.39%	1.15%
CRISIL BB	10525	0.00%	0.02%	0.01%	3.84%	87.13%	3.99%	0.49%	4.53%
CRISIL B	8855	0.00%	0.00%	0.01%	0.06%	7.28%	83.93%	0.55%	8.17%
CRISIL C	523	0.00%	0.00%	0.00%	0.19%	1.72%	17.59%	60.99%	19.50%
Total	35187								

Source: CRISIL Ratings

Table A8: One-year average transition rates: between 2004 and 2014									
Rating	Issuer- years	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB	CRISIL BB	CRISIL B	CRISIL C	CRISIL D
CRISIL AAA	852	97.89%	2.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	1677	1.13%	95.11%	3.04%	0.72%	0.00%	0.00%	0.00%	0.00%
CRISIL A	2371	0.00%	3.00%	91.48%	4.85%	0.42%	0.04%	0.04%	0.17%
CRISIL BBB	6816	0.00%	0.00%	2.25%	89.32%	6.91%	0.32%	0.25%	0.95%
CRISIL BB	10243	0.00%	0.00%	0.01%	3.89%	87.64%	4.00%	0.34%	4.12%
CRISIL B	8814	0.00%	0.00%	0.01%	0.03%	7.32%	84.01%	0.52%	8.10%
CRISIL C	449	0.00%	0.00%	0.00%	0.00%	2.00%	20.49%	60.13%	17.37%
Total	31222								

Source: CRISIL Ratings

One-year transition rates for short-term ratings – monthly static pools

Table A9: One-year average transition rates between 2004 and 2014							
Rating*	Issuer-months	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
CRISIL A1+	33577	97.21%	2.23%	0.22%	0.34%	0.00%	0.00%
CRISIL A1	11256	5.99%	86.15%	5.44%	1.04%	0.60%	0.79%
CRISIL A2	23244	0.06%	4.19%	86.33%	6.57%	1.95%	0.90%
CRISIL A3	45229	0.00%	0.06%	3.79%	85.28%	9.87%	1.01%
CRISIL A4	131730	0.00%	0.01%	0.02%	2.00%	92.56%	5.42%
Total	245036						

*CRISIL A2, CRISIL A3, and CRISIL A4 include ratings of the respective modifier levels.

Source: CRISIL Ratings

One-year transition rates for short-term ratings – annual static pools

Table A10: One-year average transition rates between 1988 and 2014							
Rating*	Issuer-years	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
CRISIL A1+	5228	97.30%	2.14%	0.27%	0.27%	0.02%	0.00%
CRISIL A1	1395	8.89%	84.88%	4.59%	0.86%	0.36%	0.43%
CRISIL A2	2149	0.28%	4.51%	85.90%	6.47%	1.86%	0.98%
CRISIL A3	4118	0.00%	0.07%	3.96%	85.58%	9.50%	0.90%
CRISIL A4	12489	0.00%	0.01%	0.02%	2.23%	92.46%	5.29%
Total	25379						

*CRISIL A2, CRISIL A3, and CRISIL A4 include ratings of the respective modifier levels.

Source: CRISIL Ratings

Table A11: One-year average transition rates between 2004 and 2014							
Rating*	Issuer-years	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
CRISIL A1+	3067	97.23%	2.22%	0.16%	0.39%	0.00%	0.00%
CRISIL A1	1027	6.04%	86.47%	5.45%	0.97%	0.49%	0.58%
CRISIL A2	2100	0.10%	4.38%	86.05%	6.57%	1.91%	1.00%
CRISIL A3	4115	0.00%	0.07%	3.96%	85.59%	9.50%	0.88%
CRISIL A4	12488	0.00%	0.01%	0.02%	2.23%	92.46%	5.29%
Total	22797						

*CRISIL A2, CRISIL A3, and CRISIL A4 include ratings of the respective modifier levels.

Source: CRISIL Ratings

Three-year CDRs for ratings of structured finance securities – for last 10 years

Table A12: One-, Two-, and Three-Year CDRs, between 2004 and 2014				
Rating	Issue-years	One-Year	Two-Year	Three-Year
CRISIL AAA(SO)	2669	0.00%	0.00%	0.00%
CRISIL AA(SO)	571	0.18%	0.45%	0.88%
CRISIL A(SO)	465	0.43%	0.43%	0.82%
CRISIL BBB(SO)	359	0.28%	1.67%	1.67%
CRISIL BB(SO) and below	26	15.39%	43.59%	43.59%
Total	4090			

Source: CRISIL Ratings

Annexure 4: Lorenz Curve and Gini Coefficient for CRISIL Ratings

Chart 3: Graphical Representation of Gini Coefficient – Lorenz Curve

CRISIL Ratings - Lorenz Curve One-Year Defaults (1988 - 2014)
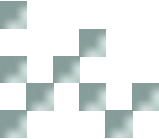
1 -Yr Gini Coeff. = Q/(P+Q) = 0.49
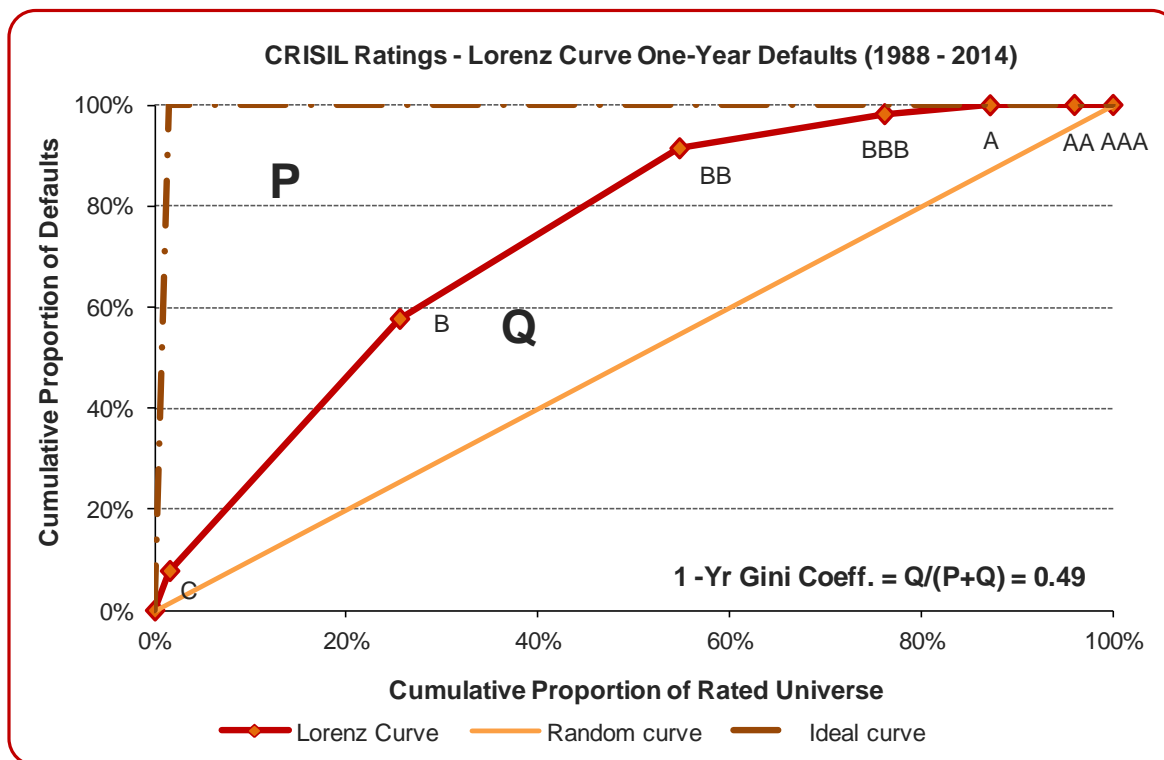
Source: CRISIL Ratings

The Gini Coefficient for one-year defaults for 1988-2014 stands at 0.49. This needs to be seen in the light of the following aspects:

a. Typically, a 'CRISIL C' rating is assigned when the firm services its rated debt on time, but defaults on its unrated debt. In most instances, firms rated 'CRISIL C' continue to default on unrated debt, but service their rated bank loan facilities (typically a revolving working capital facility) on time, thereby avoiding a rating of 'CRISIL D'. Ideally, for a high Gini Coefficient, a large portion of defaults should be from the 'CRISIL C' category—the lowest non-default rating category.

b. There is an inherent mismatch between the credit discipline required by credit rating agencies such as CRISIL (default is recognised on a 'single-rupee shortfall or single-day delay' basis) and the credit culture of the Indian banking system (non-performing assets [NPAs] are recognised at 90 days past due). There needs to be a change in this culture towards a discipline of making timely payments for the Gini Coefficient to improve.

c. 'CRISIL BB' and lower rating categories account for more than three-fourths of CRISIL's rating portfolio. These rating categories are marked by the limited information available about the firms and their inherent vulnerability to sharp rating changes.

These factors, along with the challenging credit environment, have impacted CRISIL's Gini Coefficient.

How to read the chart on Gini Coefficient, a measure of rating accuracy

If ratings had no ability to predict default, then default rates and ratings would not be correlated. For example, consider that 30 defaults occur in one year out of 1000 ratings (that is, a default rate of 3 per cent). For a randomly selected set of 100 companies (10 per cent of the rated population), one would expect to have three companies that have defaulted (10 per cent of the defaulted population), as the number of defaults one would expect in a sample is proportional to the selected number of companies. This is represented by the random curve, which will be a diagonal straight line. On the other hand, if ratings are perfect predictors of default, in the aforementioned example, the lowest 30 ratings should capture all the defaults. This is represented by the ideal curve.

Since no rating system is perfect, the actual predictive power of ratings lies between these two extremes. The cumulative curve (Lorenz curve) represents the actual case. The closer the cumulative curve is to the ideal curve, the better the predictive power of the ratings. This is quantified by measuring the area between the cumulative curve and the random curve (area 'Q' in Chart 3) in relation to the area between the ideal curve and the random curve (the sum of the areas 'P' and 'Q' in Chart 3). This ratio of Q/(P+Q), called the Gini Coefficient or the accuracy ratio, will be 1 if ratings have perfect predictive ability, as the cumulative curve will coincide with the ideal curve. On the other hand, it will be close to zero if ratings have poor predictive power, as in this case, the cumulative curve will almost coincide with the random curve. Thus, a higher Gini Coefficient indicates the superior predictive ability of any rating system.

Definitions

Cumulative default curve (also called Lorenz curve)

The Lorenz curve is a plot of the cumulative proportion of defaults category-wise *(of issuers with ratings outstanding at the beginning of the year and being in default at the end of the year)*, against the total proportion of issuers up to that category. For instance, in Chart 3, 91 per cent of the defaults recorded were in the 'CRISIL BB' and lower categories; these categories included only 55 per cent of the total ratings outstanding. In other words, the bottom 55 per cent of the ratings accounted for 91 per cent of all the defaults that occurred.

Random curve

The random curve is a plot of the cumulative proportion of issuers against the cumulative proportion of defaulters, assuming that defaults are distributed equally across rating categories. In such a plot, the bottom 55 per cent of the issuers would account for exactly 55 per cent of the defaults; the plot would, therefore, be a diagonal straight line, and the ratings would have no predictive value.

Ideal curve

The ideal curve is a plot of the cumulative proportion of issuers against the cumulative proportion of defaulters if ratings were perfectly rank-ordered so that all defaults occurred only among the lowest-rated firms. As CRISIL's overall default rate is 4.4 per cent, the bottom 4.4 per cent of issuers would have accounted for all the defaults if the ratings were perfect default predictors and any rating categories above this level would have no defaults at all.

Accuracy ratio/Gini Coefficient

Accuracy ratio = (Area between the Lorenz curve and the random curve)/(Area between the ideal curve and the random curve)

## Annexure 5: Methodology used by CRISIL in this study

Concept of static pools

CRISIL, for calculating default and transition rates, has moved to a monthly static pool methodology from the annual static pool methodology since the 2009 edition of the default and transition study. The monthly static pool methodology captures more granular monthly data such as intra-year transition and defaults, ensuring that default and transition rate estimates are more accurate and useful.

A static pool of a particular date is composed of a set of firms with a given rating outstanding as on that date. CRISIL forms static pools on the first day of every month for its default and transition study. As CRISIL calculates one-, two-, and three-year CDRs, the static pools formed are of one-, two-, and three-year lengths. Once formed, the pool does not admit any new firms. For a firm to be included in an n-year static pool, its rating has to be outstanding through the entire period of n years. Firms whose ratings are withdrawn or are placed in default in the interim will continue to be withdrawn or in default for the remaining years. Therefore, a firm that ceases to be rated and is subsequently rated again, or a firm in the pool that defaults and recovers later, is not considered for re-inclusion in the pool.

A firm that remains rated for more than one month is counted as many times as the number of months over which it was rated. The methodology assumes that all ratings are current through an ongoing surveillance process, which, in CRISIL's case, is the cornerstone of the ratings' value proposition.

For instance, a firm that had ratings alive (not withdrawn) from January 1, 2000, to January 1, 2002, would appear in twelve consecutive static pools of one-year lengths, such as January 2000 to January 2001; February 2000 to February 2001; March 2000 to March 2001. On the other hand, a firm first appearing on January 1, 2002, and having an outstanding rating until February 1, 2003, will appear only in the January 2002 to January 2003 and February 2002 to February 2003 static pools of one-year lengths. The static pools of two-year and three-year lengths are formed in a similar manner.
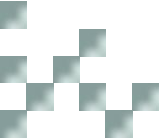
Weighted average marginal default rate

Notations:

For CRISIL's data,

M: Month of formation of the static pool (between 1988 and 2014)

R: A given rating category on the rating scale ('CRISIL AAA' to 'CRISIL C')

t: Length of the static pool in years on a rolling basis (1, 2, 3)

$P_t^M(R)$ = Defaults from rating category 'R' in the tth year of the M-month static pool

$Q_t^M(R)$ = Non-defaulted ratings outstanding at the beginning of the tth year in the rating category R from the M-month static pool

Illustration[3]: Consider a hypothetical static pool formed in January 2000, and having 100 companies outstanding at a rating of 'CRISIL BB' at the beginning of the month. Suppose that, in this pool, there is one default in the first year (ending December 2000), three in the second year (ending December 2001), and none in the third year (ending December 2002). Also, assume there are no withdrawals in any year. Then, using the above notation,

$P_1^{Jan-2000}$(CRISIL BB) = 1; $P_2^{Jan-2000}$(CRISIL BB) = 3; and $P_3^{Jan-2000}$(CRISIL BB) = 0

$Q_1^{Jan-2000}$(CRISIL BB) = 100; $Q_2^{Jan-2000}$(CRISIL BB) = 99; and $Q_3^{Jan-2000}$(CRISIL BB) = 96

For rating category R, the tth year marginal default rate for the M-month static pool is the probability of a firm, in the static pool formed in the month M, not defaulting until the end of period (t-1), and defaulting only in year t.

Mathematically, the marginal default rate for category 'R' in year t from the M-month static pool, **$MDR_t^M(R)$**, is defined as

$MDR_t^M(R) = P_t^M(R)/Q_t^M(R)$

Therefore, $MDR_1^{Jan-2000}$ (CRISIL BB) = $P_1^{Jan-2000}$ (CRISIL BB)/$Q_1^{Jan-2000}$(CRISIL BB) = 1/100 = 0.01

The average marginal default rate is calculated as the weighted average of the MDRs of all the static pools of similar lengths in the period, with the number of ratings outstanding at the beginning of the period (with appropriate withdrawal adjustments discussed later) as weights.

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[3] This illustration is for explanation only, and does not indicate the actual or observed default rates in any rating category.

Cumulative average default rate

The concept of survival analysis is used to compute the cumulative default probabilities. Using the average marginal default rate, we calculate the cumulative probability of a firm defaulting as follows:

The cumulative probability of a firm defaulting by the end of (t+1) years	=	$\Bigg[$ Cumulative probability of the firm defaulting by the end of t years + Probability of the firm defaulting in the (t+1)th year $\Bigg]$

Furthermore, for a firm to default in the (t+1)th year, it should survive until the end of t years. So,

Probability of the firm defaulting in the (t+1)th year	=	$\Bigg[$ Probability of the firm not defaulting until the end of the tth year * Marginal probability of the firm defaulting in the (t+1)th year $\Bigg]$

Now,

Probability of the firm not defaulting until the end of the tth year	=	1- Cumulative probability of the firm defaulting by the end of t years

Hence,

Probability of the firm defaulting in (t+1)th year	=	$\Bigg[$ (1- Cumulative probability of the firm defaulting by the end of t years) * Marginal probability of the firm defaulting in the (t+1)th year $\Bigg]$

Therefore, returning to the first expression,

The cumulative probability that a firm defaults by the end of (t+1) years	=	Cumulative probability of the firm defaulting by the end of t years	+ $\Bigg[$ (1- Cumulative probability of the firm defaulting by the end of t years) * (Marginal probability of the firm defaulting in (t+1)th year) $\Bigg]$

Restating the above in notation, if **CPD$_{t+1}$(R)** = cumulative default probability of a firm rated R defaulting in t+1 years, then,

$CPD_t(R) = MDR_t(R);$ for t = 1

$CPD_{t+1}(R) = CPD_t(R) + (1- CPD_t(R)) * MDR_{t+1}(R)$ for t = 2, 3
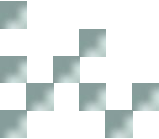
Withdrawal adjustment

In a one-year period, from the month of having obtained the rating, the firm can move to three different states—it can be timely on payments (and have a non-default rating outstanding), can default on its debt repayments, or can repay the debt fully and withdraw the rating. As firms are not monitored post-withdrawal, the 'true state' (whether default or no default) of a firm whose rating has been withdrawn remains unknown in subsequent months. Therefore, a modified $MDR_t^M(R)$ that ignores withdrawn firms is an appropriate measure of marginal default probability. As mentioned earlier, $Q_t^M(R)$ is also adjusted for the firms that belong to the static pool and have defaulted by the beginning of year t. The modified $Q_t^M(R)$ is as follows:

$Q_t^M(R) =$ Number of firms in the static pool formed at the beginning of month M with rating category R

         less   Number of defaults till the end of period (t-1)

         less   Number of withdrawn firms until the end of period t

CRISIL uses full-year withdrawal adjustment, as against no-withdrawal adjustment or mid-year withdrawal adjustment, as the issuers whose ratings were withdrawn are not immune to the risk of default. Moreover, reliable information meeting CRISIL's stringent requirements is not available post-withdrawal.

Post-default return of a firm

Post-default, firms sometimes recover, and consequently, receive a non-default rating in subsequent years. As CRISIL's credit rating is an indicator of the probability of default, default is considered an 'absorbing state', that is, a firm cannot come back to its original static pool post-default. In static pool methodology, the recovered firm is considered a new firm, which, if it continues to be rated, appears in the static pool of the month in which it recovered.

Methodology for transition rates

The t-year transition rate (from rating R1 to rating R2) for a static pool is the proportion of firms rated R1 at the beginning of the static pool that are found to be in R2 at the end of t years. This proportion is called the t-year transition probability from R1 to R2. The t-year transition matrix is formed by computing transition probabilities from various rating categories (except 'CRISIL D') to other rating categories.

Withdrawal-adjusted transition rates are computed as mentioned above, but excluding firms that are withdrawn at the end of t years. In the computation of t-year transition rates, ratings at a point of time and at the end of the tth year are considered.

Table A13 lists various elements of default rate computation and the competing approaches.

Table A13: Various Approaches to Computing Default Rates		
Withdrawal Adjustments	**Approach 1: Full-year withdrawal adjustments** Exclude all ratings withdrawn during a year from the base for calculating default rates. **Approach 2: Mid-year withdrawal adjustments** Exclude half of the ratings withdrawn during a year from the base for calculating default rates. **Approach 3: No withdrawal adjustments** Take all ratings outstanding at the beginning of a year as the base, even though some of them were withdrawn during the course of the year.	CRISIL follows Approach 1 as it believes that the issuers whose ratings were withdrawn are not immune to the risk of default after the withdrawal. More importantly, reliable information about the timeliness of debt repayment, which meets CRISIL's stringent requirements, is not available post withdrawal of the rating. Approach 1 results in the most conservative estimate of the default rates among the three approaches.
Calculating CDR	**Approach 1: Calculate CDR directly, without using marginal default rate** Calculate CDR over a period as the number of firms defaulting as a ratio of the number of firms at the beginning of the period, ignoring intra-period withdrawals. **Approach 2: Average Marginal Default Rate Methodology** Calculate marginal default rate, weigh it by sample size and accumulate it over a period to arrive at average CDR.	CRISIL follows Approach 2, which takes into account only the ratings that are not withdrawn at the end of each year as the base. This results in a more accurate and conservative estimate of the default rate. Approach 1 is not comprehensive as it ignores a large portion of the credit history of firms who may have been rated just a little while after the formation of the static pool.
Post Default Return of a firm	**Approach 1: Treat default as an 'Absorbing State'** Retain the status of a defaulted firm as default even after recovery. Treat the recovered firm as a new firm from the point of recovery. **Approach 2:** Treat a defaulted and subsequently recovered firm as a non-defaulted firm from the point of recovery. So, if a non-defaulted firm defaults in the 2nd year and recovers in the 3rd year, it will not be treated as a defaulted firm in the 3rd year marginal default rate calculation.	CRISIL follows Approach 1. As credit ratings are an opinion of the likelihood of default, the default state is treated as an absorbing state or an end point, and the firm's rating continues to be in 'default.' If a firm emerges from default and has a non-default rating on its debt instruments, this firm is treated as a new firm forming a part of a different static pool from the time its rating is revised from 'CRISIL D'.
Data Pooling	**Approach 1: Static Pool** Charge defaults against all the ratings of the issuer during the period. **Approach 2:** Charge defaults against the initial rating of the issuer. **Approach 3:** Charge defaults against the most recent year's rating of the issuer.	CRISIL follows Approach 1. Debt instruments are tradable and can be held by different investors at different points of time. As credit ratings, which convey an opinion on the likelihood of default, are intended to benefit the investors through the life of the instrument, CRISIL believes that charging defaults against all the ratings of the issuer during the period is the most appropriate approach in computing default rates. Other approaches may have limited utility. For instance, Approach 2 may be of relevance only to the investor who invests in the first-rated debt issuance of a firm and holds it to maturity. Approach 3 may be relevant only to those investors who happen to be holding the instrument just a year prior to its default.

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About CRISIL Limited

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