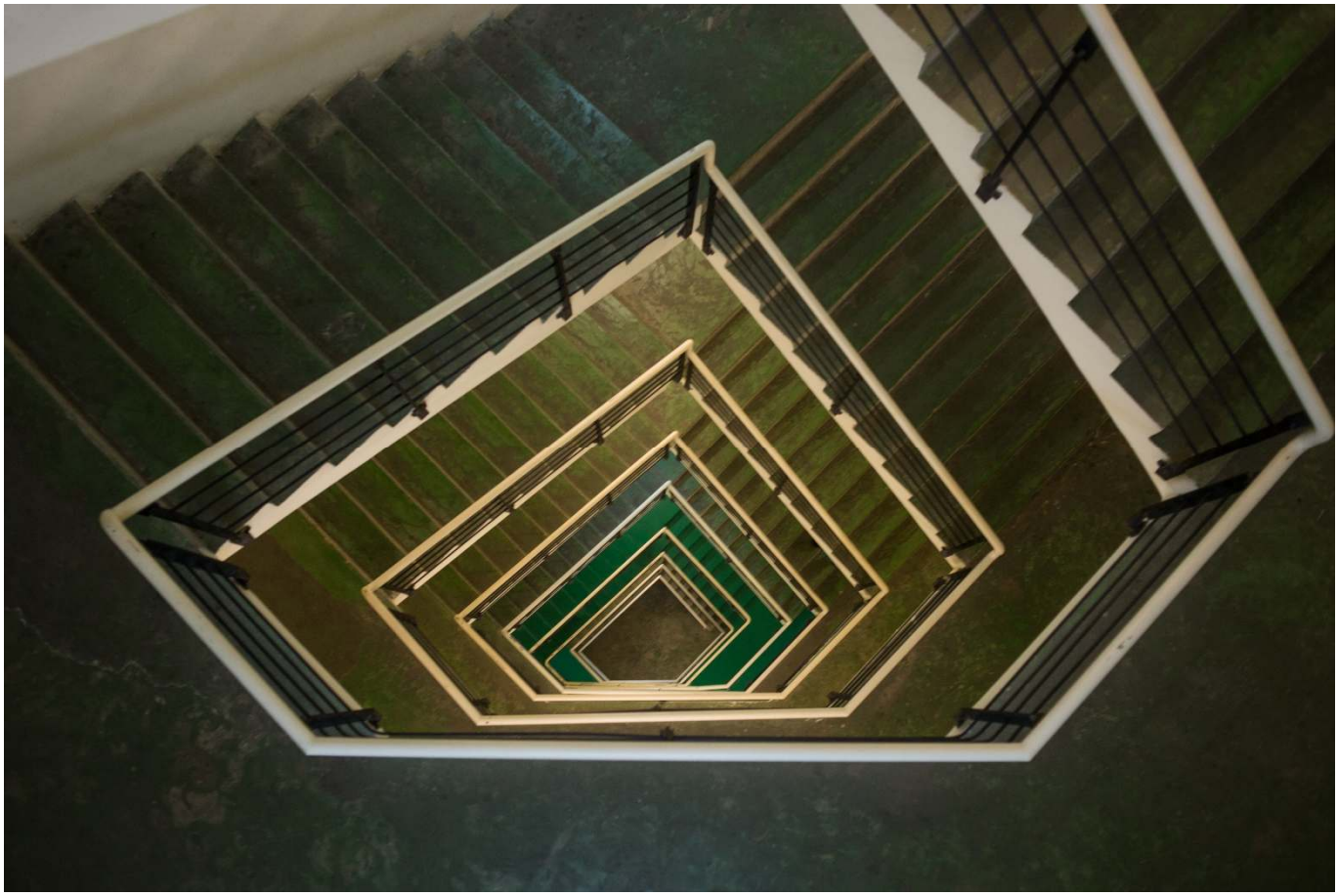
CRISIL
An S&P Global Company

CRISIL default study

Default and rating transitions till fiscal 2020



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Preface

A pioneer in the ratings business, CRISIL has been publishing its annual default study since 2004. This was way before the Securities and Exchange Board of India (SEBI) regulations made it mandatory for rating agencies to disclose default rates in 2010. CRISIL's default study is unique and follows the most conservative approach for computing default rates, with monthly static pool and a weighted average marginal default rate methodology. The data set is the largest and the most comprehensive in the Indian debt market since 1987, and spans multiple full economic cycles. Also, CRISIL has been publishing its default study every year for 15 years now, and provides a long, consistent history on the performance of credit ratings in the Indian debt market. Thus, CRISIL's default study adds significant value to various stakeholders.

Fiscal 2020 presented an exceptional set of regulatory actions, which has prompted us to review the way we present our default study.

SEBI, through its June 2019 circular titled 'Guidelines for Enhanced Disclosures by Credit Rating Agencies (CRAs)'(referred as the June 2019 circular henceforth), updated its methodology for computation of default rates by credit rating agencies (CRAs), by introducing the monthly pool approach and a weighted average marginal default rate methodology. This was a welcome change and considerably narrowed the differences between the methodology hitherto followed by CRISIL and the regulatory disclosure requirement, though some differences do persist. Key differences pertain to inclusion of non-cooperative issuers and combining ratings with 'SO' suffix with those that do not carry the 'SO' suffix in the disclosures mandated by SEBI.

In view of the significant alignment of overall computational methodologies of default rates and the ease of use in the Indian context, CRISIL will henceforth publish its default study on a fiscal basis. While the robustness of our existing methodology continues, this alignment of time periods will bring in ease of comparison with metrics required to be published by the regulator, for various stakeholders.

For the purpose of the default study publication, CRISIL will continue to exclude non-cooperative issuers from its base (except issuers that turned non-cooperative and defaulted during the same period), given the unavailability of information for rating these issuers after they turn non-cooperative. We believe that exclusion of the performance of these issuers will present a more accurate picture of the performance of issuers rated at the respective rating category.

Also, since the 2008 crisis, CRISIL has been providing a separate disclosure of default rates on instruments rated with an 'SO' suffix – a move that has provided valuable inputs to investors, considering the distinct risks faced by these instruments. Hence, CRISIL will continue to publish default rates for ratings with an 'SO' suffix separately.

It is pertinent to note that SEBI had introduced changes in the use of 'SO' suffix in its circular dated June 2019. The changes in the circular do not impact the suffix for the ratings on securitisation instruments, which form the largest pool of such ratings. It impacts a smaller subset of instruments that were earlier rated with an 'SO' suffix – particularly instruments issued by a corporate or a special purpose vehicle based on structuring of its cash flows. Given that the suffix has been removed, these instruments will henceforth be included as a part of the other database of corporate issuers.

Further, in line with the requirements of the abovementioned circular, instruments with an explicit external credit enhancement now carry a 'CE' suffix instead of the 'SO' suffix used earlier by CRISIL.

These minor changes to the methodology notwithstanding, there is a fair degree of continuity with the earlier methodology. This is reflected in the fact that default and transition rates based on the two methodologies show very minor differences. To enable various stakeholders to compare and understand the changes introduced better, key numbers based on the earlier methodology are also provided in the study in Annexure 2. The key metrics of the current methodology can be referred to in Table 1 on page 14. The comparison of the two reveals only some minor differences.

As mentioned earlier, despite the changes to SEBI and CRISIL methodologies, there continues to be differences between CRISIL's default rates as per its default study vs CRISIL's default rates as per the regulatory disclosures required by SEBI on account of continuing methodological differences in the database such as inclusion of 'SO' instruments and non-cooperative issuers in the SEBI methodology. A comparison of methodologies is presented in Annexure 1.

To enable a ready comparison, default rates as per regulatory disclosures required by SEBI have also been provided in this document (*see Annexure 3 for default rates as per SEBI disclosures; these are also available on CRISIL website*) – the abovementioned differences may be kept in mind while comparing these metrics.

We believe that a combination of CRISIL's continuing conservative and robust methodology, its comprehensive dataset since inception, and the alignment of reporting period, further strengthens the value proposition of the study. As we noted before, CRISIL continues to strive for the best-in-class methodology and practices and this is another step in that direction.

Fiscal 2021 has started with extraordinary challenges on the economic, financial and health fronts, and lenders and investors are faced with the complex task of modelling the impact and recovery from the effects of the Covid-19 pandemic. We hope that CRISIL's default study, modelled over a long period, encompassing a comprehensive dataset and with updated methodology, will further enhance the ability of various stakeholders to undertake informed credit decisions.

Somasekhar Vemuri

Default rates – meaning and significance

Default defined and computed

Default rates

What are default rates?

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

What are transition rates?

Transition rate indicates the number of instances when credit ratings have changed over a specified period. Transition rates may be calculated for the entire rated population or for a specified rating level.

How are default and transition rates used?

Accurate and reliable default and transition rates are critical inputs for all debt market participants in, among others:

a. Pricing debt

Default and transition rates are critical inputs in pricing debt instruments or loan exposures. Default probabilities associated with ratings help investors and lenders quantify the 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 in 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, or above, a certain level.

d. Indicating efficacy of the rating scale

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

Key variables in default rate computation

i. Definition of default

A clear definition of default is necessary in computing default rates. CRISIL defines default as any missed payment on a rated instrument. 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 these 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 may be computed over varying time frames, 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 has published its default rates for the past 10 fiscals, which are representative of the prevailing credit environment. CRISIL also publishes default rates from inception to date, ensuring that they are **free from period-selection bias.**

iii. Computation methodology

Default rates may be computed using several methodologies. Each has implications for the numeric outcome as explained in Table A23. 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 11.

A 'normalisation' of the variables must precede any comparison of default statistics across CRAs.

What is unique about CRISIL's default and ratings transition study?

CRISIL's default and rating transition study incorporates global best practices in computation of default rates. These include a digital definition of default, elimination of period-selection bias, application of the globally accepted marginal default rate method, and use of monthly frequency static pools as base data. CRISIL is India's first rating agency to use monthly static pools in computing default and transition rates. This rigorous method significantly enhances the 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. This study presents the default and transition statistics for the past 10 fiscals to focus on more recent rating performance. This addresses the views of many investors and policymakers 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.

Nevertheless, the study also includes the performance of ratings assigned by CRISIL since its inception in 1987. The data set is the largest and the most comprehensive in the Indian debt market as it takes into account more than one full economic cycle.

CRISIL believes it is important to present 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 better informed decisions, especially in the unprecedented situation wrought by the Covid-19 pandemic.

In computing default and transition rates for this study, all issuers in the 'issuer not cooperating' category — save the ones that have defaulted — were removed from the static pools in the subsequent months, which is similar to the treatment of withdrawn ratings. This is because such ratings lack a forward-looking perspective as they are arrived at without any management interaction, and are based on best available, limited or dated information about the firm.

If a firm defaults after it is classified as 'issuer not cooperating', it is treated as a default from its last cooperative rating. This is the most prudent approach, and ensures that default rates are accurate and reliable *(see Annexure 11 for details on treatment of non-cooperative issuers for computing the default statistics).*

Key changes in methodology

While there is no change to the core computational methodology that makes CRISIL's default study the most comprehensive and conservative, CRISIL has made a few changes to align better with the methodology prescribed by the regulator (*Refer Annexure 1 for detailed comparison between SEBI and CRISIL methodology).* The key changes to the methodology are highlighted below

1. Changes to the time period of reporting

CRISIL has introduced changes to the time period of reporting primarily to bring about alignment with financial reporting on fiscal year basis prevalent in India and to enable better comparability with default metrics as per regulatory requirements.

This implies that

- CRISIL has moved to reporting its default statistics on a fiscal year basis for its default study. The period of reporting in previous default studies was from January to December. However, hereon, it will be from April to March, in line with the financial reporting by most Indian firms.
- CRISIL will henceforth present its primary default statistics in alignment with the cohort size defined by SEBI in its June 2019 circular. CRISIL earlier presented its 10-year default statistics with 109 cohorts. In alignment with the SEBI disclosure norms, CRISIL will present default statistics with 121 cohorts. We believe this will bring about better comparability of default rate metrics as per the default study with those as per regulatory requirement.

2. Disclosure of 'SO' instruments

In its June 2019 circular, SEBI changed the norms for assigning ratings with an 'SO' suffix. While traditional securitisation instruments will retain the 'SO' suffix, those with explicit external credit enhancement will carry a 'CE' suffix. Instruments issued by corporates, which earlier could have carried a 'SO' suffix based on internal credit enhancement/structure, shall not carry a suffix anymore. In compliance with the revised norms, CRISIL had changed the suffix for instruments placed by corporates which earlier carried an 'SO' suffix in September 2019.

For default statistics, these instruments were earlier reported under structured obligations. Instruments with the 'CE' suffix will continue to be reported under 'structured obligation' dataset. We believe these instruments continue to carry distinctive risks, different from that of the underlying borrowers, and hence may be reported as part of structured obligations.

On the other hand, ratings which had an 'SO' suffix in the past, but where the suffix has been removed, will now be reported as part of long-term instruments from September 2019. This refers primarily to instruments issued by corporates, or mostly special purpose vehicles, based on structuring of internal cash flows. In compliance with the SEBI circular dated June 13, 2019, CRISIL has removed the suffix from these instruments from September 2019. To ensure consistency, keeping in mind the practical challenges in tracking these instruments on a consistent basis without a suffix, on removal of suffix, these instruments will be considered on a par with other plain vanilla instruments and will be reported as part of corporate issuers.

That said, these are a considerably smaller subset of instruments compared with the other instruments reported under structured obligations, and hence this change does not materially impact the metrics.

Overall, we note that these changes in methodology are primarily to bring about greater alignment and comparability and hence also enhance the utility of CRISIL's default study even further for all stakeholders. The comparison between these two methodologies are provided in the current default study for the convenience of the reader in this transition year. The key metrics of the current methodology can be referred to in Table 1 on page 14 and the previous methodology in Annexure 2. The considerable similarities between the previous and current methodologies are highlighted from the insignificant differences in the metrics based on these two methodologies.

Executive summary

The overall annual default rate for CRISIL-rated firms was 4.5% in fiscal 2020, with 318 defaults during the fiscal. Of the more than 9,000 cooperative issuers with outstanding ratings in CRISIL's portfolio as of March 2020, almost 60% had ratings in 'CRISIL BB' category or lower.

The overall default rate has increased marginally from 4.0% in fiscal 2019, largely because of the higher proportion of ratings in lower rating categories — 'CRISIL BB' category or lower *(see Chart 1)* — that are inherently more vulnerable to default.

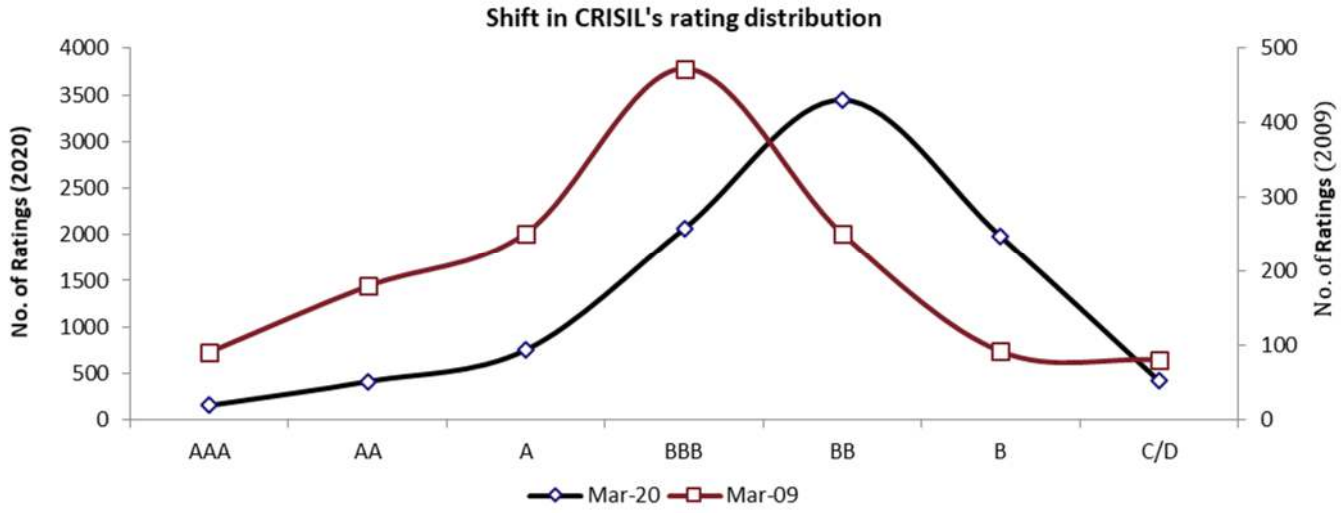
Key highlights

- The average default rates for the 'CRISIL BBB' and above rating categories reduced for the period from fiscal 2010 to fiscal 2020 in comparison with the period from fiscal 2009 to fiscal 2019.
- CRISIL's average default rates continue to exhibit ordinality across rating categories, that is, the higher rating categories have lower default rates.
- No long-term instrument rated 'CRISIL AAA' has ever defaulted in a one-, two- or three-year period.
- The overall annual default rate rose marginally to 4.5% in fiscal 2020 from 4.0% in fiscal 2019 (4.4% in calendar year 2018) primarily on account of the increased proportion of ratings in low rating categories — 'CRISIL BB' category or lower, and also given a challenging economic environment.
- The stability rates of long-term ratings have continued to strengthen over the years – the overall stability rate across ratings touched 88% for the period from fiscal 2010 to fiscal 2020.
- The stability rates for short-term ratings remain strong across rating categories.

I. CRISIL's rating distribution

CRISIL had outstanding long-term ratings on more than 9,000 cooperative issuers as on March 31, 2020, up from close to 1,400 as on March 31, 2009. The growth in the portfolio has been accompanied by changes in CRISIL's rating distribution — an increasing number of ratings have been assigned in low rating categories. Nearly 63% of ratings were in the 'CRISIL BB' category or lower as of March 2020, as against one-third as of March 2009. Consequently, CRISIL's rating distribution has altered significantly, with the median rating moving to the 'CRISIL BB' category in 2020 from 'CRISIL BBB' in 2009 (*see Chart 1*).

Chart 1: Shift in CRISIL's rating distribution



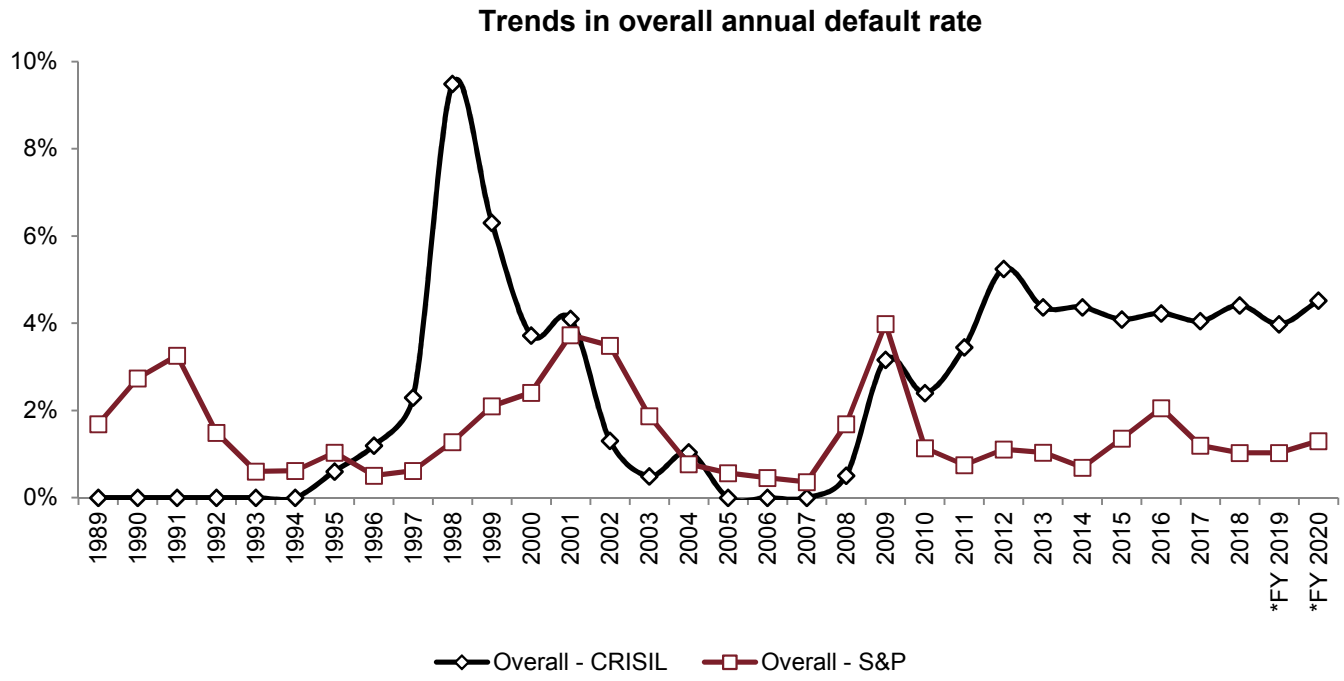
Source: CRISIL Ratings

II. Overall annual default rates since inception

Annual default rate for corporate issuers[1] remains stable

Default rates have to be both low and stable over a given period to be usefully factored into debt pricing. Chart 2 indicates the trend for CRISIL's annual default rates (the proportion of defaults in long-term ratings to outstanding non-default long-term ratings during a year).

Chart 2: Overall annual default rates



There has been a change in reporting of default statistics by CRISIL from the calendar year to the fiscal, and CRISIL's default rates from 2019 onwards are on fiscal basis.
**The default rates of S&P Global Ratings are computed on calendar year basis, and hence they correspond to the December-ending period for the prior year.*

Source: CRISIL Ratings and S&P Global Ratings

[1] *The term 'corporate issuers' has been used generically to include public and private limited companies, societies, trusts, and partnership and proprietorship firms, across the manufacturing, financial, and infrastructure sectors, that have availed of long-term ratings from CRISIL.*

III. For corporate issuers

One-, two- and three-year Cumulative Default Rates (CDRs)

Credit ratings are opinions on the risk of default: the higher the rating, the lower the probability of default should be. The inverse correlation between credit ratings and default probability is desirable for CRAs, and is called the test of ordinality. Table 1 shows CRISIL's one-, two- and three-year withdrawal-adjusted CDRs across rating categories from fiscal 2010 to fiscal 2020 (*see Annexure 11 for methodology used in calculation of default rates*). CRISIL's default rates continue to be ordinal. Notably, not a single instrument rated 'CRISIL AAA' has ever defaulted in one-, two- or three-year periods.

Table 1: CRISIL's average CDRs for long-term ratings – monthly static pools

	One, two and three-year CDRs (FY 2010-FY 2020)			
Rating category	**Issuer-months**	**One-year**	**Two-year**	**Three-year**
CRISIL AAA	12,521	0.00%	0.00%	0.00%
CRISIL AA	31,258	0.02%	0.08%	0.16%
CRISIL A	58,780	0.18%	0.82%	1.62%
CRISIL BBB	1,84,160	0.82%	2.13%	3.82%
CRISIL BB	2,99,166	3.55%	7.57%	11.41%
CRISIL B	2,61,780	8.28%	16.58%	23.25%
CRISIL C	8,740	20.62%	34.14%	42.89%
Total	8,56,405			

Source: CRISIL Ratings

The average default rates (*see Table A8, Annexure 4*) from fiscals 1989 to 2020, indicating rating behaviour over a prolonged period, were also ordinal.

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

Transition rates indicate the instances of a given rating migrating to other rating categories (*see Table 2*). 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. They are also of crucial importance to investors mandated to hold investments of a minimum credit quality.

Table 2: CRISIL's average one-year transition rates for long-term ratings (FY 2010-FY 2020) - monthly static pools

Rating category	Issuer-months	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB	CRISIL BB	CRISIL B	CRISIL C	CRISIL D
CRISIL AAA	12,521	98.78%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	31,258	1.38%	96.11%	2.37%	0.12%	0.00%	0.00%	0.00%	0.02%
CRISIL A	58,780	0.02%	2.84%	92.39%	4.32%	0.19%	0.03%	0.03%	0.18%
CRISIL BBB	1,84,160	0.00%	0.05%	2.58%	90.82%	5.47%	0.19%	0.07%	0.82%
CRISIL BB	2,99,166	0.00%	0.00%	0.01%	3.91%	88.44%	3.85%	0.25%	3.55%
CRISIL B	2,61,780	0.00%	0.00%	0.00%	0.04%	8.13%	83.08%	0.46%	8.28%
CRISIL C	8,740	0.00%	0.00%	0.01%	0.00%	1.43%	19.65%	58.30%	20.62%
Total	8,56,405								

Source: CRISIL Ratings

The highlighted diagonal in Table 2 indicates the stability rate of each rating category. Between fiscal 2010 and fiscal 2020, around 96.1% of 'CRISIL AA' ratings remained in that category at the end of one year, 1.4% were upgraded to 'CRISIL AAA', and 2.5% were downgraded to 'CRISIL A' category or lower.

As with CRISIL's default rates, its one-year transition rates are also comprehensive and reliable. This is because they have been compiled using monthly static pools that cover data for the past 10 fiscals and are representative of the prevailing credit environment. CRISIL has also published the one-year transition rates over a longer period since the first rating was assigned, covering multiple business cycles (*see Table A11, Annexure 5; for transition rates based on the annual static pools methodology, see Tables A12 and A13, Annexure 5; also see Tables A1, A2 and A3, Annexure 2 for default and transition rates in line with the previous methodology).*

Table 3 provides the average 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 highlighted diagonal represent the proportion of upgrades, while those to the right represent the proportion of downgrades. For instance, the stability rate for the 'CRISIL A1+' rating is 98.1% over one year, and 7.1% of 'CRISIL A1' ratings have been upgraded to 'CRISIL A1+' in a year.

Table 3: CRISIL's average one-year transition rates for short-term ratings (FY 2010-FY 2020) - monthly static pools

Rating*	Issuer-months	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
CRISIL A1+	48,573	98.14%	1.59%	0.16%	0.07%	0.01%	0.03%
CRISIL A1	21,683	7.13%	86.43%	5.21%	0.49%	0.31%	0.42%
CRISIL A2	51,159	0.13%	4.72%	88.06%	5.46%	1.07%	0.56%
CRISIL A3	1,05,553	0.01%	0.05%	4.63%	86.98%	7.57%	0.77%
CRISIL A4	3,32,074	0.00%	0.01%	0.02%	2.35%	92.41%	5.22%
Total	5,59,042						

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

CRISIL has also published one-year transition rates over a longer period, since the first rating was assigned, and covered multiple business cycles (*see Table A14, Annexure 5; for transition rates based on the annual static pools methodology, see Tables A15 and A16, Annexure 5).*

Movement in stability rates for long-term ratings

Stability rates indicate the proportion of ratings that have remained unchanged over a period. CRISIL's stability rates have been high for investment-grade ratings and have increased over the years, indicating lower volatility in these categories. Table 4 indicates CRISIL's one-year stability rates for various periods. The stability rate for 'CRISIL BBB' and higher categories has increased for fiscals 2010-2020 from that in fiscals 2009-2019. The stability rates for 'CRISIL AAA' and 'CRISIL AA' ratings, for instance, have consistently exceeded 97% and 95%, respectively, while those for 'CRISIL A' and 'CRISIL BBB' ratings have exceeded 91% and 89%, respectively.

Table 4: Average one-year stability rates for various periods

Period	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB
FY 2010 - FY 2020	**98.8%**	**96.1%**	**92.4%**	**90.8%**
FY 2009 - FY 2019	98.2%	95.4%	92.0%	90.8%
2008 – 2018*	98.8%	95.7%	91.9%	90.8%
2007 – 2017*	97.8%	95.3%	91.7%	90.6%
2006 – 2016*	97.6%	95.3%	91.6%	90.2%
2005 – 2015*	97.7%	95.7%	91.9%	89.8%

Source: CRISIL Ratings

CRISIL has been previously reporting these metrics on a calendar year basis. However with this edition, the reporting is moved to fiscal year basis and hence comparative figures have been provided for period ending fiscal 2019 and fiscal 2020

**Refers to calendar year. The current reported figures cannot be strictly compared with the previous reported calendar year figures due to the minor difference in timeframe of computation (Refer Annexure 1 for detailed comparison of previous and current methodology)*

Table 5: Average one-year stability rates since 1988

Period	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB
FY 1989 - FY 2020	**97.6%**	**94.0%**	**90.2%**	**90.1%**
FY 1989 - FY 2019	97.6%	93.7%	89.8%	90.0%
1988 - 2018*	97.6%	93.7%	89.7%	89.9%
1988 - 2017*	97.4%	93.3%	88.9%	89.2%
1988 - 2016*	97.3%	93.3%	88.7%	88.6%
1988 - 2015*	97.3%	93.0%	87.8%	87.6%

Source: CRISIL Ratings

CRISIL has been previously reporting these metrics on a calendar year basis. However with this edition, the reporting is moved to fiscal year basis and hence comparative figures have been provided for period ending fiscal 2019 and fiscal 2020

**Refers to calendar year. The current reported figures cannot be strictly compared with the previous reported calendar year figures due to the minor difference in timeframe of computation (Refer Annexure 1 for detailed comparison of previous and current methodology)*

Table 5 indicates the average one-year stability rate of each rating category over several periods since 1988. These continue to display higher stability each year.

IV. For structured finance instruments (ratings with 'SO' or 'CE' suffix)

CRISIL pioneered the rating of several complex structured finance instruments in the Indian market. Its data set comprises 6,467 issue years, including 3,422 issue years for retail asset-backed securities (ABS) and retail mortgage-backed securities (MBS) spanning over 28 years. CRISIL also had outstanding ratings on a variety of structured finance instruments, which were also assigned an 'SO' suffix, including those backed by full or partial guarantee. In compliance with the SEBI circular in June 2019, part of the instruments backed by explicit external credit enhancement have been assigned a 'CE' suffix beginning September 2019. The performance of instruments with 'CE' suffix will continue to be reported as part of structured finance securities. For abundant clarity, the reference to 'SO'suffix in the default and transition metrics presented in the below section, also includes instruments which have migrated to 'CE' suffix recently.

Further, for a smaller subset of instruments, particularly those issued by corporates, or mostly special purpose vehicles, based on structuring of internal cash flows, the 'SO' suffix has been removed since September 2019. Practical challenges arise in tracking such instruments on a consistent basis without a suffix. Hence to ensure consistency, on removal of suffix, these instruments will be considered at par with other plain vanilla instruments and will be reported as part of corporate issuers. However, given the smaller subset of instruments in comparison with the larger pool of securitised instruments which carry an 'SO' suffix, this change is not expected to impact the metrics materially.

One-, two- and three-year CDRs

Table 6 provides the one-, two- and three-year average CDRs for each rating category between fiscal 1993[2] and fiscal 2020 (*see Table A17 in Annexure 6 for default rates during fiscal 2010-fiscal 2020)*.

Table 6: CRISIL's average CDRs for ratings on structured finance instruments – annual static pools

	One-, two- and three-year CDRs (FY 1993- FY 2020)			
Rating category	**Issue-years**	**One-year**	**Two-year**	**Three-year**
CRISIL AAA (SO)	3,748	0.05%	0.14%	0.26%
CRISIL AA (SO)	1,027	0.29%	0.72%	1.13%
CRISIL A (SO)[3]	959	0.63%	2.01%	5.03%
CRISIL BBB (SO)	598	0.84%	2.22%	2.22%
CRISIL BB (SO) and below	135	22.96%	40.23%	43.08%
Total	**6,467**			

Source: CRISIL Ratings

[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 the annual static pool methodology as defaults in structured finance securities have been rare.

[3] The higher default rates in the 'CRISIL A (SO)'category are largely on account of defaults on multiple instruments of two issuers, backed by the same guarantor. If all the instruments were treated as one, the three-year-default rate would be 2.71%.

The non-zero default rates in the 'CRISIL AAA (SO)' category are on account of defaults on instruments by two issuers. One was 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. The default was subsequently cured, the investors were paid in full, and the rated instrument was redeemed.

The other pertained to a securitised instrument issued by a non-bank, where the originating non-bank defaulted and subsequently went into liquidation in fiscal 2020. The ratings on the securitised instruments were downgraded due to commingling risks, despite adequate collections and cash collateral. Furthermore, due to legal interpretation issues, the trustee did not make payments to the investors despite available cash collateral and hence the rating was downgraded to default in fiscal 2020. The same trust also had another instrument which defaulted from AA(SO) category.

One-year transition rates

Around 58% of all structured finance ratings–3,748 of 6,467 issue years–are rated 'CRISIL AAA (SO)' and show a high stability rate of over 98%. Table 7 shows the average one-year transition rates during fiscal 1993- fiscal 2020 for structured finance instruments.

Table 7: CRISIL's average one-year transition rates for structured finance instruments (FY 1993-FY 2020) - annual static pools

Rating category	Issue-years	CRISIL AAA (SO)	CRISIL AA (SO)	CRISIL A (SO)	CRISIL BBB (SO)	CRISIL BB (SO) and below	CRISIL D (SO)
CRISIL AAA (SO)	3,748	98.29%	1.41%	0.16%	0.00%	0.08%	0.05%
CRISIL AA (SO)	1,027	5.16%	92.41%	1.95%	0.00%	0.19%	0.29%
CRISIL A (SO)	959	0.73%	5.94%	87.80%	2.40%	2.50%	0.63%
CRISIL BBB (SO)	598	2.34%	2.17%	11.04%	81.44%	2.17%	0.84%
CRISIL BB (SO) and below	135	2.22%	0.74%	2.22%	8.15%	63.70%	22.96%
Total	**6,467**						

Source: CRISIL Ratings

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

Movement in stability rates

Table 8: Average one-year stability rates of structured finance ratings since 1993

Period	CRISIL AAA (SO)	CRISIL AA (SO)	CRISIL A (SO)	CRISIL BBB (SO)
FY 1993-FY 2020	**98.3%**	**92.4%**	**87.8%**	**81.4%**
FY 1993-FY 2019	**98.4%**	**92.2%**	**88.1%**	**81.3%**
1993-2018*	98.4%	91.6%	87.7%	80.6%
1993-2017*	98.4%	91.3%	88.4%	80.5%
1993-2016*	98.4%	91.5%	88.6%	80.4%
1993- 2015*	98.3%	91.1%	88.7%	81.8%

Source: CRISIL Ratings

CRISIL has been previously reporting these metrics on a calendar year basis. However with this edition, the reporting is moved to fiscal year basis and hence comparative figures have been provided for period ending fiscal 2019 and fiscal 2020

**Refers to calendar year. The current reported figures cannot be strictly compared with the previous reported calendar year figures due to the minor difference in timeframe of computation (Refer Annexure 1 for detailed comparison of previous and current methodology)*

Table 9: Average one-year stability rates of structured finance ratings for various periods

Period	CRISIL AAA (SO)	CRISIL AA (SO)	CRISIL A (SO)	CRISIL BBB (SO)
FY 2010-FY 2020	**99.5%**	**93.6%**	**84.8%**	**79.7%**
FY 2009-FY 2019	**98.3%**	**93.2%**	**86.1%**	**80.4%**
2008-2018*	99.6%	92.3%	84.7%	78.1%
2007- 2017*	98.3%	92.2%	86.9%	79.5%
2006- 2016*	98.3%	93.1%	88.2%	80.0%
2005- 2015*	98.3%	92.7%	89.1%	82.0%

Source: CRISIL Ratings

CRISIL has been previously reporting these metrics on a calendar year basis. However with this edition, the reporting is moved to fiscal year basis and hence comparative figures have been provided for period ending fiscal 2019 and fiscal 2020

**Refers to calendar year. The current reported figures cannot be strictly compared with the previous reported calendar year figures due to the minor difference in timeframe of computation (Refer Annexure 1 for detailed comparison of previous and current methodology)*

CRISIL-rated structured finance instruments exhibit high stability rates. India's securitisation market has largely been 'CRISIL AAA (SO)'-centric, as reflected in the large number of issue years for this rating category. However, there has been improvement in data density in rating categories such as 'CRISIL BBB (SO)' of late, explaining the move towards ordinality in stability rates.

V. One-year transition rates of retail ABS and MBS issuances

CRISIL's database of retail ABS and MBS transactions consists of 3,422 issue years across 28 years (fiscal 1993-fiscal 2020). The year 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 fiscal 1993-fiscal 2020. 'CRISIL AAA (SO)'-rated ABS or MBS instruments, which account for close to three-fourths of the ratings in the database, have a stability rate of 98.2%.

Table 10: CRISIL's average one-year transition rates for ABS and MBS ratings (FY 1993-FY 2020) - annual static pools

Rating category	Issue years	CRISIL AAA (SO)	CRISIL AA (SO)	CRISIL A (SO)	CRISIL BBB (SO)	CRISIL BB (SO) and below	CRISIL D (SO)
CRISIL AAA (SO)	2,513	98.25%	1.47%	0.20%	0.00%	0.04%	0.04%
CRISIL AA (SO)	269	15.24%	82.53%	1.12%	0.00%	0.74%	0.37%
CRISIL A (SO)	167	4.19%	14.97%	76.65%	3.59%	0.60%	0.00%
CRISIL BBB (SO)	451	3.10%	2.88%	11.09%	81.82%	0.44%	0.67%
CRISIL BB (SO) and below	22	13.64%	4.55%	4.55%	13.64%	50.00%	13.64%
Total	**3,422**						

Source: CRISIL Ratings

The non-zero default rates in the 'CRISIL AAA (SO)' and CRISIL AA (SO) category are on account of defaults two RMBS instruments, one in each of the above rating categories, issued by a trust. The originator of these instruments was a non-bank, which defaulted and subsequently went into liquidation in fiscal 2020. The ratings on the securitised instruments were downgraded due to commingling risks, despite adequate collections and cash collateral. Furthermore, due to legal interpretation issues, the trustee did not make payments to the investors despite available cash collateral and hence the rating was downgraded to default in fiscal 2020.

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

Conclusion

The overall annual default rate rose marginally in fiscal 2020, largely because of a higher proportion of ratings in low rating categories — 'CRISIL BB' or lower — which are inherently vulnerable to default.

The strength of CRISIL's rating process is demonstrated by the ordinality of its default rates and the high stability of its ratings. CRISIL has set up, stabilised, and refined its processes over almost three decades of rating experience. The robustness of its ratings is today recognised by issuers and investors. This study is based on CRISIL ratings assigned over 30 years, covering multiple credit cycles. Because of the quality, vintage and diversity of the instruments, the size of the database, and the use of monthly static pool methodology, this remains the most comprehensive study on corporate defaults and rating transitions in India.

VI. Annexures

Annexure 1: Comparison of methodologies

Parameters	SEBI's previous methodology[4]	SEBI's new methodology[5]	CRISIL's earlier methodology	CRISIL's current methodology
Static pool	Annual static pool	Monthly static pool	Both monthly and annual static pool	Same as CRISIL's earlier methodology
Withdrawal adjustment	No adjustment for withdrawals during the year	Exclude ratings that are withdrawn during the year except securities	Exclude ratings that are withdrawn during the year	Same as CRISIL's earlier methodology
Treatment of non-cooperative issuers	Issuers that turn non-cooperative during the year are included	Issuers that turn non-cooperative during the year are included	Issuers that turn non-cooperative during the year are excluded (barring the ones that have defaulted)	Same as CRISIL's earlier methodology
Calculating CDR	Calculate CDR directly, without using marginal default rate	Average marginal default rate methodology	Average marginal default rate methodology	Same as CRISIL's earlier methodology
Calendar/fiscal	Fiscal year	Fiscal year	Calendar year	Fiscal year
Timeframe	For last five years	For last 121 cohorts for long run and for 24, 36, 48 cohorts for short run	For last ten years (109 cohorts) and since inception	For last 121 cohorts and since inception

[4] *Refers to SEBI circular dated May 03, 2010 titles 'Guidelines for Credit Rating Agencies'*

[5] *Refers to SEBI circular dated June 13, 2019 titled 'Guidelines for Enhanced Disclosures by Credit Rating Agencies'*

Parameters	SEBI's previous methodology[6]	SEBI's new methodology[7]	CRISIL's earlier methodology	CRISIL's current methodology
Issuer/ Instrument reporting	Corporate issuers are reported at issuer level and 'SO' instruments are reported at instrument level.	Corporate issuers are reported at issuer level and 'SO' instruments are reported at instrument level with the following adjustments: Corporate issuers with multiple ratings of different seniority levels on different instruments accounted with a cap of 3 instances. For structured finance trusts issuing multiple tranches, the number of instances to be capped at 3 for different categories if the seniority is different.	Corporate issuers are reported at issuer level and 'SO' instruments are reported at instrument level.	Same as CRISIL's earlier methodology
Split of databases	Default rates on corporate issuers and structured finance instruments provided separately	Default rates on corporate issuers and structured finance instruments are provided together	Default and transition rates on corporate issuers and structured finance instruments are provided separately	Same as CRISIL's earlier methodology[8]

[6] *Refers to SEBI circular dated May 03, 2010 titles 'Guidelines for Credit Rating Agencies'*

[7] *Refers to SEBI circular dated June 13, 2019 titled 'Guidelines for Enhanced Disclosures by Credit Rating Agencies'*

[8] *Ratings which had an 'SO' suffix in the past and the suffix was removed due to implementation of SEBI June 2019 circular, will now be reported as part of long-term instruments from September 2019.*

Annexure 2: Comparative default and transition rates based on the previous methodology

Table A1: CDRs for long-term ratings (CY 2009-CY 2019) – monthly static pools

		One, two and three-year CDRs		
Rating category	**Issuer-months**	**One-year**	**Two-year**	**Three-year**
CRISIL AAA	11,333	0.00%	0.00%	0.00%
CRISIL AA	28,536	0.02%	0.09%	0.17%
CRISIL A	54,288	0.17%	0.82%	1.56%
CRISIL BBB	173,152	0.81%	2.11%	3.70%
CRISIL BB	287,723	3.53%	7.50%	11.29%
CRISIL B	255,355	8.21%	16.43%	22.98%
CRISIL C	8,251	20.89%	34.77%	43.82%
Total	**818,638**			

Source: CRISIL Ratings

Table A2: Average one-year transition rates for long-term ratings (CY 2009-CY 2019) – monthly static pools

Rating category	**Issuer-months**	**CRISIL AAA**	**CRISIL AA**	**CRISIL A**	**CRISIL BBB**	**CRISIL BB**	**CRISIL B**	**CRISIL C**	**CRISIL D**
CRISIL AAA	11,333	98.78%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	28,536	1.38%	96.08%	2.39%	0.12%	0.00%	0.00%	0.00%	0.02%
CRISIL A	54,288	0.02%	2.78%	92.42%	4.37%	0.18%	0.02%	0.03%	0.17%
CRISIL BBB	173,152	0.00%	0.04%	2.59%	90.86%	5.45%	0.18%	0.07%	0.81%
CRISIL BB	287,723	0.00%	0.00%	0.01%	3.94%	88.42%	3.86%	0.24%	3.53%
CRISIL B	255,355	0.00%	0.00%	0.00%	0.04%	8.07%	83.21%	0.46%	8.21%
CRISIL C	8,251	0.00%	0.00%	0.01%	0.00%	1.41%	19.16%	58.53%	20.89%
Total	**818,638**								

Source: CRISIL Ratings

Table A3: Average one-year transition rates for short-term ratings (CY 2009-CY 2019) – monthly static pools

Rating*	Issuer-months	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
CRISIL A1+	44,082	98.13%	1.61%	0.17%	0.06%	0.01%	0.03%
CRISIL A1	19,965	6.91%	86.49%	5.42%	0.43%	0.34%	0.41%
CRISIL A2	47,464	0.14%	4.82%	87.86%	5.55%	1.06%	0.56%
CRISIL A3	99,193	0.01%	0.05%	4.67%	86.98%	7.55%	0.75%
CRISIL A4	320,455	0.00%	0.00%	0.02%	2.35%	92.42%	5.21%
Total	**531,159**						

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

Annexure 3: Cumulative Default Rates disclosed as per SEBI[9] methodology

In line with the SEBI methodology outlined in Annexure 1, the following tables (A4 to A7) include ratings on corporate issuers, structured finance instruments and ratings on non co-operative issuers. The computation also include adjustments prescribed in June 2019 circular.

Table A4: Long-run average default rates for long term instruments– monthly static pools

	One, two and three-year CDRs (FY 2010-FY 2020)		
Rating category	**One-year**	**Two-year**	**Three-year**
CRISIL AAA	0.01%^	0.03%^	0.04%
CRISIL AA	0.08%^	0.22%	0.31%
CRISIL A	0.21%	0.90%	1.76%
CRISIL BBB	0.78%	2.02%	3.55%
CRISIL BB	3.07%	6.27%	9.22%
CRISIL B	6.65%	12.70%	17.37%
CRISIL C	17.50%	28.55%	35.89%

^On account of one default each from AAA and AA rating category. Both defaults were due to unexpected legal events.

9 The computation of default rates is in line with the methodology articulated in SEBI circular dated June 13th 2019. These are also available on CRISIL website at: https://crisil.com/content/dam/crisil/generic-images1/our-businesses/ratings/regulatory-disclosure-highlighted-policies/regulatory-disclosures/sebi/disclosures-as-per-sebi-circular-cir-mirsd-cra-6-2010/long-run-and-short-run-average-default-rates.pdf

Table A5: Long-run average default rates for short term instruments– monthly static pools

Rating*	One-year default rate FY 2010-FY 2020
CRISIL A1+	0.03%
CRISIL A1	0.42%
CRISIL A2	0.55%
CRISIL A3	0.73%
CRISIL A4	4.53%

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

Table A6: Short-run average default rates for long term instruments– monthly static pools

	One, two and three-year CDRs		
Rating category	One-year	Two-year	Three-year
Period	FY 2018- FY 2020	FY 2017- FY 2020	FY 2016- FY 2020
CRISIL AAA	0.06%^	0.11%^	0.16%
CRISIL AA	0.16%^	0.28%	0.28%
CRISIL A	0.04%	0.29%	1.19%
CRISIL BBB	0.77%	2.08%	3.09%
CRISIL BB	2.34%	4.69%	7.20%
CRISIL B	5.38%	9.97%	14.50%
CRISIL C	11.10%	22.12%	33.84%

^On account of one default each from AAA and AA rating category. Both defaults were due to unexpected legal events.

Table A7: Short-run average default rates for short term instruments– monthly static pools

Rating*	One-year default rate FY 2018-FY 2020
CRISIL A1+	0.07%
CRISIL A1	0.02%
CRISIL A2	0.36%
CRISIL A3	0.59%
CRISIL A4	3.78%

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

Annexure 4: Comparative default rates for different periods

Table A8: CDRs for long-term ratings (FY 1989-FY 2020) – monthly static pools

		One, two and three-year CDRs		
Rating category	**Issuer-months**	**One-year**	**Two-year**	**Three-year**
CRISIL AAA	22,387	0.00%	0.00%	0.00%
CRISIL AA	51,181	0.03%	0.23%	0.58%
CRISIL A	77,301	0.38%	1.62%	3.28%
CRISIL BBB	193,423	0.98%	2.51%	4.47%
CRISIL BB	303,319	3.72%	7.81%	11.75%
CRISIL B	262,499	8.30%	16.63%	23.31%
CRISIL C	9,694	21.59%	35.69%	44.56%
Total	**919,804**			

Source: CRISIL Ratings

Table A9: CDRs for long-term ratings (FY 2010-FY 2020) – annual static pools

		One, two and three-year CDRs		
Rating category	**Issuer-years**	**One-year**	**Two-year**	**Three-year**
CRISIL AAA	1,138	0.00%	0.00%	0.00%
CRISIL AA	2,831	0.04%	0.12%	0.12%
CRISIL A	5,323	0.15%	0.84%	1.73%
CRISIL BBB	16,293	0.79%	2.07%	3.88%
CRISIL BB	26,304	3.59%	7.64%	11.56%
CRISIL B	22,814	8.29%	16.72%	23.75%
CRISIL C	762	19.95%	33.54%	42.92%
Total	**75,465**			

Source: CRISIL Ratings

Table A10: CDRs for long-term ratings (FY 1989-FY 2020) – annual static pools

		One, two and three-year CDRs		
Rating category	**Issuer-years**	**One-year**	**Two-year**	**Three-year**
CRISIL AAA	1,919	0.00%	0.00%	0.00%
CRISIL AA	4,410	0.05%	0.25%	0.52%
CRISIL A	6,771	0.41%	1.64%	3.33%
CRISIL BBB	16,912	0.86%	2.41%	4.44%
CRISIL BB	26,593	3.75%	7.86%	11.83%
CRISIL B	22,858	8.30%	16.76%	23.81%
CRISIL C	834	21.10%	34.92%	44.80%
Total	**80,297**			

Source: CRISIL Ratings

Annexure 5: Comparative transition rates for different periods

One-year transition rates for long-term ratings

Table A11: Average one-year transition rates (FY 1989-FY 2020) – monthly static pools

Rating category	Issuer-months	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB	CRISIL BB	CRISIL B	CRISIL C	CRISIL D
CRISIL AAA	22,387	97.65%	2.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	51,181	1.62%	94.03%	3.78%	0.38%	0.13%	0.02%	0.02%	0.03%
CRISIL A	77,301	0.01%	3.02%	90.24%	5.04%	1.06%	0.08%	0.16%	0.38%
CRISIL BBB	193,423	0.00%	0.07%	2.70%	90.06%	5.74%	0.29%	0.15%	0.98%
CRISIL BB	303,319	0.00%	0.01%	0.01%	3.89%	88.21%	3.84%	0.32%	3.72%
CRISIL B	262,499	0.00%	0.00%	0.00%	0.05%	8.11%	83.06%	0.47%	8.30%
CRISIL C	9,694	0.00%	0.00%	0.01%	0.12%	1.30%	17.86%	59.12%	21.59%
Total	**919,804**								

Source: CRISIL Ratings

Table A12: Average one-year transition rates (FY 2010-FY 2020) – annual static pools

Rating category	Issuer-years	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB	CRISIL BB	CRISIL B	CRISIL C	CRISIL D
CRISIL AAA	1,138	98.77%	1.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	2,831	1.38%	96.04%	2.44%	0.11%	0.00%	0.00%	0.00%	0.04%
CRISIL A	5,323	0.02%	2.76%	92.11%	4.47%	0.39%	0.06%	0.04%	0.15%
CRISIL BBB	16,293	0.00%	0.05%	2.56%	90.77%	5.54%	0.21%	0.09%	0.79%
CRISIL BB	26,304	0.00%	0.00%	0.01%	3.80%	88.60%	3.75%	0.25%	3.59%
CRISIL B	22,814	0.00%	0.00%	0.00%	0.03%	8.02%	83.21%	0.45%	8.29%
CRISIL C	762	0.00%	0.00%	0.00%	0.00%	1.71%	19.29%	59.06%	19.95%
Total	**75,465**								

Source: CRISIL Ratings

Table A13: Average one-year transition rates (FY 1989-FY 2020) – annual static pools

Rating category	Issuer-years	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB	CRISIL BB	CRISIL B	CRISIL C	CRISIL D
CRISIL AAA	1,919	97.71%	2.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	4,410	1.61%	94.26%	3.70%	0.25%	0.11%	0.02%	0.00%	0.05%
CRISIL A	6,771	0.01%	2.92%	90.27%	5.02%	1.12%	0.09%	0.15%	0.41%
CRISIL BBB	16,912	0.00%	0.07%	2.67%	90.12%	5.82%	0.29%	0.17%	0.86%
CRISIL BB	26,593	0.00%	0.01%	0.01%	3.79%	88.38%	3.73%	0.32%	3.75%
CRISIL B	22,858	0.00%	0.00%	0.00%	0.03%	8.00%	83.20%	0.46%	8.30%
CRISIL C	834	0.00%	0.00%	0.00%	0.12%	1.56%	17.63%	59.59%	21.10%
Total	**80,297**								

Source: CRISIL Ratings

One-year transition rates for short-term ratings

Table A14: Average one-year transition rates (FY 1989-FY 2020) – monthly static pools

Rating*	Issuer-months	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
CRISIL A1+	87,129	97.66%	1.88%	0.26%	0.17%	0.02%	0.02%
CRISIL A1	27,294	8.92%	85.19%	4.74%	0.52%	0.25%	0.37%
CRISIL A2	52,893	0.22%	4.76%	87.82%	5.48%	1.11%	0.61%
CRISIL A3	1,06,734	0.01%	0.05%	4.59%	86.92%	7.62%	0.82%
CRISIL A4	3,32,882	0.00%	0.01%	0.02%	2.34%	92.41%	5.23%
Total	**6,06,932**						

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

Table A15: Average one-year transition rates (FY 2010-FY 2020) – annual static pools

Rating*	Issuer-years	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
CRISIL A1+	4,422	98.10%	1.65%	0.16%	0.07%	0.00%	0.02%
CRISIL A1	1,944	7.05%	86.47%	5.20%	0.62%	0.31%	0.36%
CRISIL A2	4,595	0.13%	4.59%	87.73%	5.59%	1.35%	0.61%
CRISIL A3	9,264	0.02%	0.02%	4.57%	87.00%	7.67%	0.71%
CRISIL A4	28,913	0.00%	0.01%	0.02%	2.30%	92.48%	5.20%
Total	**49,138**						

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

Table A16: Average one-year transition rates (FY 1989-FY 2020) – annual static pools

Rating*	Issuer-years	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
CRISIL A1+	7,506	97.64%	1.93%	0.29%	0.09%	0.03%	0.01%
CRISIL A1	2,348	9.80%	84.37%	4.73%	0.51%	0.26%	0.34%
CRISIL A2	4,661	0.19%	4.68%	87.60%	5.58%	1.35%	0.60%
CRISIL A3	9,270	0.02%	0.02%	4.56%	87.00%	7.68%	0.71%
CRISIL A4	28,918	0.00%	0.01%	0.02%	2.30%	92.48%	5.20%
Total	**52,703**						

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

Annexure 6: Comparative default rates for structured finance instruments

Table A17: CDRs for ratings of structured finance instruments (FY 2010-FY 2020)

	One, two and three-year CDRs			
Rating category	**Issue-years**	**One-year**	**Two-year**	**Three-year**
CRISIL AAA (SO)	1,833	0.05%	0.14%	0.29%
CRISIL AA (SO)	799	0.38%	0.95%	1.55%
CRISIL A (SO)	506	1.19%	4.54%	10.18%
CRISIL BBB (SO)	518	0.97%	2.64%	2.64%
CRISIL BB (SO) and below	91	26.37%	41.61%	48.91%
Total	**3,747**			

Source: CRISIL Ratings

Annexure 7: Comparative default and transition rates for corporate issuers including ratings on non-cooperative issuers[10]

Table A18: CDRs for long-term ratings – monthly static pools

	One, two and three-year CDRs (FY 2010-FY 2020)			
Rating category	**Issuer-months**	**One-year**	**Two-year**	**Three-year**
CRISIL AAA	12,527	0.00%	0.00%	0.00%
CRISIL AA	31,275	0.02%	0.08%	0.16%
CRISIL A	59,224	0.18%	0.81%	1.60%
CRISIL BBB	1,94,115	0.78%	1.99%	3.53%
CRISIL BB	3,65,085	3.04%	6.21%	9.15%
CRISIL B	3,52,163	6.64%	12.68%	17.35%
CRISIL C	10,835	17.43%	28.50%	35.84%
Total	**10,25,224**			

Source: CRISIL Ratings

10 In computing default statistics, entities classified as 'issuer not cooperating' were considered as a part of the static pools, and were not treated as withdrawals on classification.

Table A19: Average one-year transition rates for long-term ratings (FY 2010-FY 2020) – monthly static pools

Rating category	Issuer-months	CRISIL AAA	CRISIL AA	CRISIL A	CRISIL BBB	CRISIL BB	CRISIL B	CRISIL C	CRISIL D
CRISIL AAA	12,527	98.77%	1.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CRISIL AA	31,275	1.38%	96.09%	2.39%	0.12%	0.00%	0.00%	0.00%	0.02%
CRISIL A	59,224	0.02%	2.82%	92.02%	4.53%	0.37%	0.03%	0.03%	0.18%
CRISIL BBB	1,94,115	0.00%	0.04%	2.48%	87.81%	8.46%	0.35%	0.08%	0.78%
CRISIL BB	3,65,085	0.00%	0.00%	0.01%	3.35%	86.91%	6.47%	0.22%	3.04%
CRISIL B	3,52,163	0.00%	0.00%	0.00%	0.05%	6.38%	86.56%	0.37%	6.64%
CRISIL C	10,835	0.00%	0.00%	0.01%	0.00%	1.15%	15.97%	65.44%	17.43%
Total	**10,25,224**								

Source: CRISIL Ratings

Table A20: Average one-year transition rates for short term ratings (FY 2010-FY 2020) – monthly static pools

Rating*	Issuer-months	CRISIL A1+	CRISIL A1	CRISIL A2	CRISIL A3	CRISIL A4	CRISIL D
CRISIL A1+	48,606	98.11%	1.60%	0.17%	0.08%	0.01%	0.03%
CRISIL A1	21,853	7.08%	86.19%	5.31%	0.52%	0.48%	0.42%
CRISIL A2	52,204	0.13%	4.63%	86.96%	5.70%	2.03%	0.55%
CRISIL A3	1,10,859	0.01%	0.05%	4.46%	84.24%	10.52%	0.73%
CRISIL A4	4,08,330	0.00%	0.00%	0.02%	1.98%	93.46%	4.53%
Total	**6,41,852**						

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

Source: CRISIL Ratings

Annexure 8: Industry-wise classification of defaults

CRISIL is the first rating agency in India to publish industry-wise classifications and a chronological account of all defaults in its portfolio that form part of the static pools used for computing default rates. Since CRISIL's inception, there have been 3,374 defaults by issuers with long-term ratings. Over the past 32 years, five industries (textiles, distributors, food products, metal and mining, and real estate development) accounted for almost 50% of these defaults, as shown in Table A21.

Table A21: Industry-wise and chronological break-up of defaults on long-term instruments over the past 32 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	2015	2016	2017	2018	FY 2019	FY 2020
Textiles- Apparel & Luxury Goods		1	1	3	1	3	1	1		1					3	8	12	26	50	45	53	46	55	52	70	55	39
Distributors																1	3	9	31	37	48	59	53	39	42	27	15
Food Products				1	2	3					1					3	6	7	23	30	44	43	51	35	52	40	34
Metals & Mining			2	1	6	2	2	2			1					2	6	28	34	31	23	35	19	23	6	4	12
Real Estate Development						1		1								1	2	4	7	14	35	25	38	35	16	16	21
Construction & Engineering					1			1								3	4	4	16	21	28	20	25	23	32	34	27
Machinery					2	2	1									3	3	6	17	19	18	20	27	16	13	10	21
Diversified Consumer Services																1	1	8	10	22	11	16	17	9	13	11	12
Specialty Retail																		2	8	11	13	13	9	16	9	10	15
Containers & Packaging					2	1										1	3	1	13	10	6	12	12	7	9	10	6
Hotels Restaurants & Leisure						1										2	5	7	16	10	8	4	6	9	2	2	7
Construction Materials			1		2	2	1		1							2	1	3	8	12	5	3	6	11	6	7	5
Independent Power Producers & Energy Traders								1							1	1	3	4	7	10	6	5	6	13	6	3	9
Auto Components			1		1	1		1								1	1	2	11	9	6	5	10	9	4	2	2
Pharmaceuticals			1		1	2		1								4	2	5	7	4	13	7	4	3	6	6	5
Electrical Equipment						1	1										2	7	6	11	9	7	2	2	8	6	6
Chemicals				1	2	2	3	3	1								1	1	6	3	4	7	6	8	3	3	5
Building Products															1			2	9	1	3	8	10	9	7	8	6
Paper & Forest Products				1	1	1									1	1	5	4	4	6	4	6	4	4	2	1	1
Commercial Services & Supplies						1										3		1	5	2	4	7	7	5	5	5	13
Household Durables		1	1		3				1							3		1	5	2	4	5	4	3	3	3	6
Health Care Providers & Services																	1	2	4	4	2	6	3	6	5	4	9
Electronic Equipment Instruments & Components							1									1		4	1	2	8	3		6	5	3	7
Non Banking Financial Company				4	12	2												2						1			1
Others				2	9	2	2				1					2	7	21	43	30	23	33	29	20	21	35	34
Total Defaults	0	2	7	13	45	27	12	11	3	1	3	0	0	0	6	43	68	161	341	346	378	395	403	364	345	305	318
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%	4.1%	4.2%	4.1%	4.4%	4.0%	4.5%

** The proportion of total defaults in a particular year to total non-default ratings outstanding at the beginning of the year (adjusted for withdrawals and non-cooperative issuers during the year)*

Source: CRISIL Ratings

The number of defaults, in absolute terms, in fiscals 2019 and 2020 remained low compared to previous periods. The annual default rate remains high due to a drop in the outstanding ratings compared with a few previous years. The higher default rates between 1997 and 1999 were because of factors such as economic slowdown and structural/regulatory changes, especially in the financial sector. The textile industry witnessed the largest number of defaults in fiscal 2020 as well, in line with past trends.

Annexure 9: Analysis of defaults: Time to default (for corporate issuers)

Higher ratings farther away from default

Analysis of the 3,374 defaults (*see Table A22*) indicates that the higher-rated firms were farther away from default than lower-rated ones. Issuers that were rated in the 'CRISIL B' or 'CRISIL C' categories and which defaulted, did so in 18 and 17 months respectively; issuers rated 'CRISIL A' and 'CRISIL AA' and which defaulted, did so in 49 and 59 months, respectively.

Time to default for issuers rated 'CRISIL AAA' was around 15 years[11].

Table A22: Average time to default (for defaulted firms) in number of months

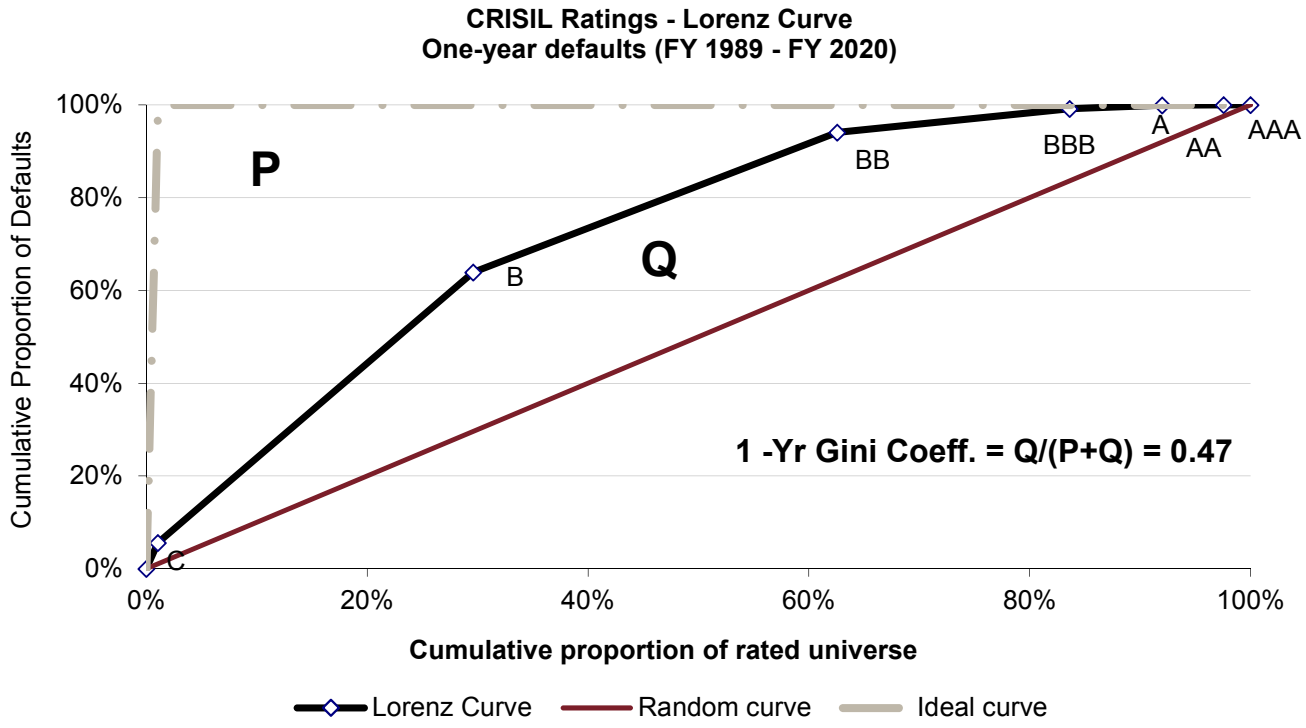
Rating category	Months to default
CRISIL AAA	177
CRISIL AA	59
CRISIL A	49
CRISIL BBB	35
CRISIL BB	23
CRISIL B	18
CRISIL C	17

Source: CRISIL Ratings

[11] *In the 32 years through 2020, only one entity originally rated 'CRISIL AAA' has ever defaulted. The entity was last rated 'CRISIL AAA' in 2009, and has been gradually downgraded over the years due to significant changes in the company's business and financial risk profiles. It eventually defaulted in 2018 from a much lower rating category. The defaulted instrument was repaid shortly post default and the investors did not face any loss.*

Annexure 10: Lorenz curve and Gini coefficient for CRISIL Ratings

Chart 3: Graphical representation of Gini coefficient – Lorenz curve



Source: CRISIL Ratings

CRISIL's Gini coefficient for one-year defaults for FY 1989- FY 2020 was 0.47. With the rigorous surveillance processes, while Gini has improved in the current period, challenges remain with respect to the overall Gini coefficient. Some of the factors that have impacted the coefficient are as follows:

a. Typically, a 'CRISIL C' rating is assigned when the firm defaults on unrated debt, while continuing to service rated debt on time. In most instances, such firms 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 CRAs such as CRISIL (which recognises default as a 'single-rupee shortfall or single-day delay') and the credit culture of the Indian banking system (where non-performing assets are recognised at 90 days past due) and hence there needs to be a systemic shift towards timely payments for the Gini coefficient to improve.

c. More than three-fourths of CRISIL's rated portfolio consists of issuers in categories 'CRISIL BB' and lower. Not only do these categories have limited availability of information about the firms, but they are also inherently vulnerable to sharp rating changes.

Reading 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 out of 1,000 ratings (that is, a default rate of 3%) in one year. For a randomly selected set of 100 companies (10% of the rated population), three companies could be expected to have defaulted (10% of the defaulting 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. However, if ratings are perfect predictors of default, then the lowest 30 ratings should capture all the defaults in this case. This is represented by the ideal curve.

As no rating system is perfect, the actual predictive power of ratings lies between the 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 with 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 predictive ability of any rating system.

Definitions

Lorenz curve

The Lorenz curve is a plot of the cumulative proportion of category-wise defaults (of issuers with ratings outstanding at the beginning of the year and in default at the end of the year), against the total proportion of issuers up to that category. For instance, in Chart 3, around 94% of the defaults recorded were in categories 'CRISIL BB' and lower; these included nearly 63% of the total ratings outstanding. In other words, the lower 63% of the ratings accounted for 94% of all defaults.

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 lower 63% of the issuers would account for exactly 63% of 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 that of defaulters if ratings were perfectly ranked such that all defaults occurred only among the lowest-rated firms. As CRISIL's overall default rate is 4.5%, the lower 4.5% of issuers would have accounted for all defaults if the ratings were perfect default predictors, and 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 11: Methodology used by CRISIL in this study

Concept of static pools

In calculating default and transition rates, CRISIL moved to the monthly static pool method from the annual static pool method with 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 similar 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 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 a month is counted as many times as the number of months over which it was rated. The method 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 April 1, 2000, to April 1, 2002, would appear in 12 consecutive static pools of one-year lengths, such as April 2000 to April 2001; May 2000 to May 2001; June 2000 to June 2001 and so on. On the other hand, a firm first appearing on April 1, 2002, and having an outstanding rating until May 1, 2003, will appear only in the April 2002 to April 2003 and May 2002 to May 2003 static pools of one-year lengths. The static pools of two- 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 (1988-2020)

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 t^{th} year of the M-month static pool

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

Illustration[12]: Consider a hypothetical static pool formed in April 2000 and having 100 companies outstanding at a rating of 'CRISIL BB' at the beginning of the month. If there is one default in the pool in the first year (2000), three in the second (2001), and none in the third (2002), and no withdrawals in any year, then:

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

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

For rating category R, the t^{th} 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, $\mathbf{MDR_t^M(R)}$, is defined as

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

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

The average marginal default rate is calculated as the weighted average of the marginal default rates 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.

[12] *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 cumulative default probabilities. Using the average marginal default rate, the cumulative probability of a firm defaulting is calculated as follows:

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

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	=	[Probability of the firm not defaulting until the end of the t^{th} year * Marginal probability of the firm defaulting in the $(t+1)^{th}$ year]

Now,

Probability of the firm not defaulting until the end of the t^{th} 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	=	[(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]

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	+	[(1- Cumulative probability of the firm defaulting by the end of t years) * (Marginal probability of the firm defaulting in $(t+1)^{th}$ year)]

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

Within a year of obtaining the rating, a firm may move to one of three states: timely payment (non-default rating outstanding), default on debt repayment, or full repayment of the debt and withdrawal of the rating. As firms are not monitored post-withdrawal, the 'true state' (whether in default or not) of a firm whose rating has been withdrawn remains unknown in subsequent months. Therefore, a modified $MDR_t^M(R)$ that ignores firms on which the rating is withdrawn is an appropriate measure of marginal default probability. As mentioned earlier, $Q_t^M(R)$ is also adjusted for 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 adjustments, as against no withdrawal adjustment or a 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. 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 on which the rating has been 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 t^{th} year are considered.

How CRISIL treats non-cooperative issuers

The SEBI circular, *'Enhanced standards for credit rating agencies (CRAs)'* issued on November 1, 2016, makes it mandatory for CRAs to continue to rate non-cooperative issuers on a best-effort basis. To highlight non-cooperation, SEBI has insisted that all such ratings will use the suffix 'issuer not cooperating'[13]. CRISIL uses its criteria for assessing information adequacy risk for arriving at credit ratings that are commensurate with the extent of information received from issuers that CRISIL categorises as non-cooperative.

In computing default and transition rates in this study, all such issuers (except defaulters) are removed from the static pools in the subsequent months (treatment similar to a withdrawn rating), because such ratings lack a forward-looking perspective as they are arrived at without any management interaction, and are based on best available, limited or dated information about the firm.

If a firm defaults after being classified as 'issuer not cooperating', it is treated as a defaulter from its last cooperative rating.

Consider, for instance, company ABC, with an outstanding rating of 'CRISIL BB' as on March 31, 2016: ABC turns non-cooperative, and the rating is migrated to 'CRISIL B; Issuer not cooperating' in April 2017. In June 2017, assume that CRISIL comes to know — either from the banker or from sources in the public domain — of delays by ABC in debt servicing. The rating is then downgraded to 'CRISIL D; Issuer not cooperating'. In computing default statistics, ABC will, therefore, be considered as having defaulted from 'CRISIL BB' and not 'CRISIL B'.

CRISIL has also published the default and transition statistics including ratings on non-cooperative issuers in *Annexure 7*. It should be noted that for the computation of these default and transition statistics, the static pool for December 2016 does not include non-cooperative issuers, as SEBI had mandated all CRAs to categorise issuers in issuer not cooperating category from January 2017.

[13] SEBI had, in its original circular, directed CRAs to append 'Issuer did not cooperate; based on best available information' with the rating symbol in the same font size for non-cooperative issuers. However, in joint representation to SEBI, CRAs clarified that, for sake of brevity, they will use the suffix 'Issuer not cooperating'. This will be followed by an asterisk mark, which will read as 'Issuer did not cooperate; based on best available information'.

Table A23: Various approaches to computing default rates

Withdrawal adjustments	**Approach 1: Full-year withdrawal adjustments** Exclude all ratings withdrawn during a year from the base in calculating default rates. **Approach 2: Mid-year withdrawal adjustments** Exclude half of the ratings withdrawn during a year from the base in calculating default rates. **Approach 3: No withdrawal adjustments** Take all ratings outstanding at the beginning of a year as the base, even though some are withdrawn during the year.	CRISIL follows Approach 1, as it believes issuers whose ratings are withdrawn are not immune to the risk of default after 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 default rates among the three.
Calculating CDR	**Approach 1: Calculate CDR directly, without using marginal default rate** Calculate CDR over a period as a ratio of the number of firms defaulting to the number of firms at the beginning of the period, ignoring intra-period withdrawals. **Approach 2: Average marginal default rate methodology** Calculate the marginal default rate, weigh it by sample size and accumulate it over a period to arrive at average CDR.	CRISIL follows Approach 2, and takes into account only the ratings that are not withdrawn at the end of each year as base. This results in a more accurate and conservative estimate of default rates. Approach 1 is not comprehensive as it ignores a large portion of the credit history of firms that may have been rated soon after the static pool was formed.
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 second year and recovers in the third year, it will not be treated as a defaulted firm in the third year marginal default rate calculation.	CRISIL follows Approach 1. As credit ratings are an opinion on 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, it is treated as a new firm, and 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 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.

Notes

About CRISIL Limited

CRISIL is a leading, agile and innovative global analytics company driven by its mission of making markets function better.

It is India's foremost provider of ratings, data, research, analytics and solutions, with a strong track record of growth, culture of innovation and global footprint.

It has delivered independent opinions, actionable insights, and efficient solutions to over 100,000 customers.

It is majority owned by S&P Global Inc, a leading provider of transparent and independent ratings, benchmarks, analytics and data to the capital and commodity markets worldwide.

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CRISIL Ratings is part of CRISIL Limited ("CRISIL"). We pioneered the concept of credit rating in India in 1987. CRISIL is registered in India as a credit rating agency with the Securities and Exchange Board of India ("SEBI"). With a tradition of independence, analytical rigour and innovation, CRISIL sets the standards in the credit rating business. We rate the entire range of debt instruments, such as, bank loans, certificates of deposit, commercial paper, non-convertible / convertible / partially convertible bonds and debentures, perpetual bonds, bank hybrid capital instruments, asset-backed and mortgage-backed securities, partial guarantees and other structured debt instruments. We have rated over 24,500 large and mid-scale corporates and financial institutions. CRISIL has also instituted several innovations in India in the rating business, including rating municipal bonds, partially guaranteed instruments and microfinance institutions. We also pioneered a globally unique rating service for Micro, Small and Medium Enterprises (MSMEs) and significantly extended the accessibility to rating services to a wider market. Over 1,10,000 MSMEs have been rated by us.

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