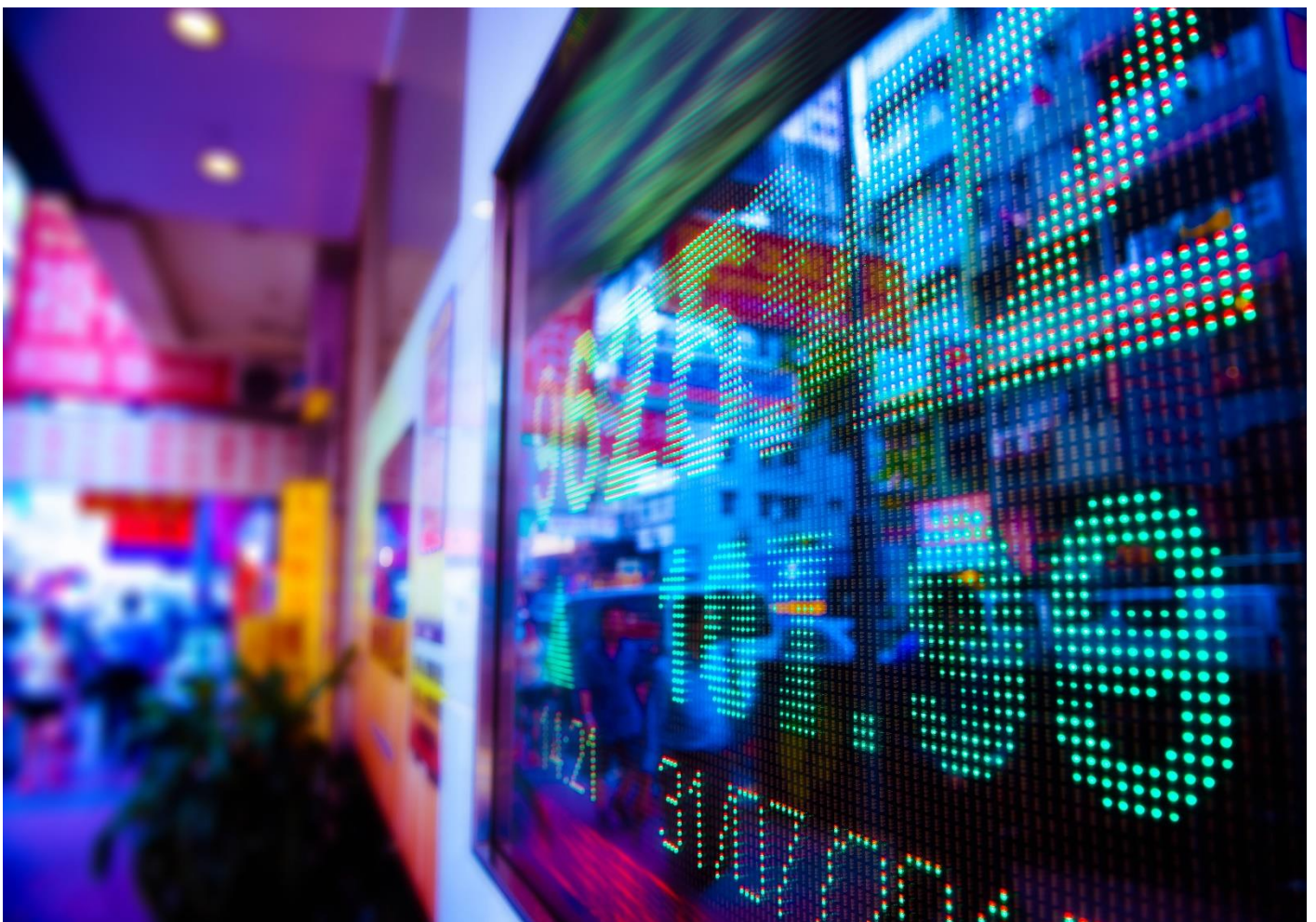# Does market signal credit risk changes?

CRISIL Ratings study tests the reliability of market indicators

September 2023

Analytical contacts

Somasekhar Vemuri
Senior Director, Regulatory Affairs and Operations
and Chief Criteria Officer
somasekhar.vemuri@crisil.com

Ramesh Karunakaran
Director – Rating Criteria and Product Development
ramesh.karunakaran@crisil.com

Chaitali Nehulkar
Director – Rating Criteria and Product Development
chaitali.nehulkar@crisil.com

Vishal Raj
Analyst – Rating Criteria and Product Development
vishal.raj@crisil.com

Executive summary

The efficient market hypothesis asserts that markets are efficient and that stock prices accurately reflect all available information. Theoretically, the posit can echo in bond markets as well.

By extension, these market signals, particularly, significant movements in the prices of shares and yields on bonds should mirror market perspectives on credit profiles as well.

To be sure, numerous quantitative models exist that assess the creditworthiness of an entity by incorporating market-based inputs into their analyses.

For example, models such as 'distance to default' utilise historical defaults and market capitalisation of entities to predict future defaults. Another is the Altman Z-Score, which predicts bankruptcy probabilities based on inputs such as the market value of equity.

But not all market movements are linked to changes in credit risk profiles. There are other factors at play as well, which can impact the dynamics of that.

Share price fluctuation, for instance, can be influenced by overall market sentiment, expectations, demand-supply, liquidity, and momentum. These may not necessarily align with an underlying company's credit quality.

Furthermore, the stock market tends to prioritise metrics such as earnings per share and potential upside. If such expectations are not met, there can be a correction in share prices.

In contrast, credit ratings focus primarily on the fundamental strength of a company, in terms of its business operations and financial stability, and ability to withstand shocks.

Similarly, in bonds, factors such as market liquidity or illiquidity, sector-specific concerns, and macroeconomic environment can have a bearing on sentiment and, consequently, yields. But these factors may not potentially impact the creditworthiness of the underlying entity.

Sentiment can also occasionally drive changes in share prices and bond yields that are challenging to rationalise. Warren Buffett summed it up cogently*: "When the price of a stock can be influenced by a 'herd' on Wall Street, with prices set by the most emotional, greedy, or depressed individuals, it becomes difficult to argue that the market always prices assets rationally. In fact, market prices often defy logical explanation.[1]"*

On their part, credit rating agencies (CRAs) factor some of these signals to supplement fundamental analysis.

But it is crucial to distinguish between credit and non-credit factors that lead to the generation of market signals.

To assess the reliability and effectiveness of market signals (such as share prices and bond yields) in predicting changes in credit ratings, CRISIL Ratings conducted a study on its rated portfolio.

The purpose was to decipher the linkage between market signals and changes in credit rating, to evaluate the extent to which the signals align with a CRA's assessment of creditworthiness.

The study provides valuable insights into the relationship between market movements and credit ratings.

The results of the study are covered in this article.

---

[1] *The Superinvestors of Graham-and-Doddsvill, 1984*

A. Study on share prices

CRISIL Ratings assessed the effectiveness of major share price movements as a lead indicator of changes in the credit profiles of debt issuers. The aim was to test the hypothesis that a substantial increase in stock prices could potentially signal an improvement in the issuer's credit quality, leading to a corresponding rating upgrade. Conversely, a significant downward movement might indicate a deterioration in credit profile leading to a downward adjustment in the credit rating.

The study covered 623 listed companies (co-operative issuers; comprising the full arc of market capitalisation — large, mid and small-caps) from the CRISIL Ratings portfolio as of December 2022. A range of rating movements, including upgrades, downgrades, revisions in outlook and rating watch actions were analysed.

The time frame — two years starting January 2021 — was chosen to provide insights into recent performance, particularly in the post-pandemic environment when equity markets began stabilising after a volatile phase.

	Jan 2021 – Dec 2022
Number of companies studied	623
Rating/outlook/watch change (companies)	271
Total rating action for 271 companies	389
Number of rating/outlook/watch changes (companies)	352
Number of rating actions/reaffirmations for 352 companies[2]	704

The study was repeated for 2018-2020 as well, and the results were broadly in line with what is presented here.

Methodology

The methodology involved monitoring share price movements of entities and the aim was to identify notable and sharp volatility[3] in prices. The study considered a threshold of (+/-) 5-15% change in stock prices over a week as the criterion for determining significant movements, which enabled examination of potential implications on credit profiles of the entities *(see annexure for further details on the thresholds).*

The (+/-) 5-15% change in stock prices was calculated in relation to the movement of an underlying index. This approach aimed to isolate stock-specific volatility and mitigate the influence of overall market movement. That is because some events can affect the entire stock market and not necessarily indicate specific changes in the credit quality of individual underlying issuers. For instance, during the Global Financial Crisis of 2008, Indian equities halved by value. Such market-wide events impact most stocks and considering them as significant volatility for a particular stock can be an erroneous assumption.

Additionally, different indices were utilised to compare large, mid and small-cap companies to provide a more representative assessment of the market impact on different segments. For instance, a large-cap index such as the Nifty100 was used to better gauge the market impact on large-cap entities, while small-cap indices were employed to replicate the market impact on small-cap entities. This approach ensured the analysis considered relevant market factors based on the appropriate indices and accounted for the representation of similar entities within those indices.
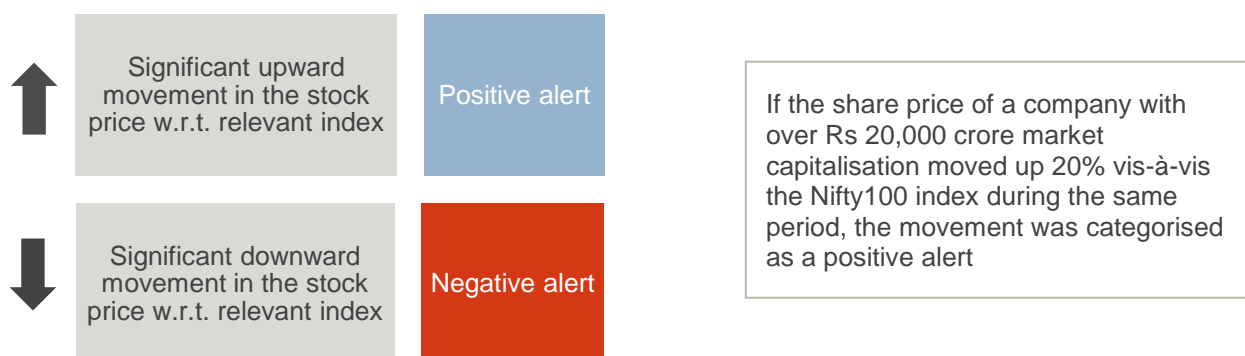
In summary:

- The study employed a threshold of (+/-) 5-15% movement in a stock related to the relevant index to identify significant share price movements

- Different indices were utilised to compare stock price movements against the appropriate index

---

2 For the 352 companies that went through no rating movement during the study, two instances of reaffirmation each were assumed for the analysis as all outstanding ratings are typically reviewed once every 12-15 months

3 Markets capture information almost on a real time basis. Sharp movements may indicate that markets anticipate changes in the future financial performance of an entity, which is being reflected through change in the share prices

- Share price movements exceeding these thresholds were categorised as alerts, and further classified based on whether the movement was positive or negative, determined by the direction of prices.

↑	Significant upward movement in the stock price w.r.t. relevant index	Positive alert
↓	Significant downward movement in the stock price w.r.t. relevant index	Negative alert

> If the share price of a company with over Rs 20,000 crore market capitalisation moved up 20% vis-à-vis the Nifty100 index during the same period, the movement was categorised as a positive alert

By using these thresholds and classification criteria, the framework identified significant share price movements that could potentially be associated with shifts in the creditworthiness of the entities under study.

Efficacy testing of the framework

The framework thus constructed was tested for its efficacy in indicating changes in credit profiles. The study compared alerts based on the framework with rating actions by CRISIL Ratings. The ratings act as a reference for indicating change in the credit profile of an issuer.

The assessment focused on determining whether rating actions were preceded by alerts (implying significant share price movement) in the past six months. A period of six months was used because fundamental indicators such as financial statements are released quarterly and balance sheet figures half-yearly. In an ideal scenario, market signals would show up before rating actions — positive alert before an upgrade and negative before a downgrade.

The objective of this testing was to ascertain the predictive ability of share price movements and whether they could be utilised as indicators of possible rating actions. However, the study also considered instances where share price alerts failed to predict rating actions within a reasonable time period or generated false alerts. These occurrences served as crucial indicators of the limitations of the framework.

Failure to indicate change in credit profile

If an alert is not observed in the 180 days preceding a rating action, it suggests that the framework failed to signal the change in credit profile. On the other hand, alerts that aligned with the direction of the rating action were considered successful indicators of a change in the company's credit profile.

False alerts

This refers to generation of alerts when no rating action took place. To evaluate the occurrence of false alerts, we looked at companies that did not witness any rating action during the study period. By doing so, the study aimed to assess the extent to which the framework may have generated alerts that did not align with the movement in credit profile.

Results of the study: Relationship between rating changes and share price movements

Portfolio		Changes based on market signals	
		Rating change = Yes	Rating change = No
Actual	Rating change = Yes (389 rating changes)	63/389 – (A) (16%)	326/389 – (B) (84%)
	Rating change = No (704 reaffirmations)	376/704 – (C) (53%)	328/704 (47%)

Observation A, B: Out of a total 389 instances of rating changes observed, directional alerts were identified as precursors to the rating change in 63 cases. In the remaining 326 instances, there were no directional alerts despite the occurrence of a rating change. This indicates that the framework successfully generated alerts prior to a rating change in some cases, while no alerts were observed even though a rating change took place.

Contra alerts[4] reduce the discriminatory power of market signals

For the 63 instances where a rating change was preceded by directional alerts – it was observed that there were total 119 directional alerts and 72 contra alerts against these cases.

So, while one may conclude that the alerts were correct against 63 instances of rating actions, the fact is that presence of contra alerts makes it challenging for the analysts to effectively incorporate them in real-time assessments. Contra alerts only add to the complexity and uncertainty faced by analysts when studying and interpreting them. Consequently, it can lead to confusion and fatigue among analysts who are trying to make informed assessments based on the alerts received.

Observation C: Out of the 704 instances of rating reaffirmations, false alerts were generated in 376[5] instances.

False alerts are an information burden for analysts

This occurrence can be attributed to the fundamental difference in drivers between equity movements and ratings. Equity movements are often influenced by the perceived potential upside of a stock, whereas ratings are more focused on evaluating the fundamental strength of the issuer in meeting its debt obligation.

This disparity in factors driving equity movements vs rating assessments contributes to the generation of false alerts. The presence of a large number of false alerts adds to the volume of information that analysts need to study during the rating exercise, thereby adding to confusion and noise to the analysis because such alerts do not accurately reflect changes in the credit profiles of the issuers.

So, while share price signals can indicate changes in credit profile in some cases, its overall efficacy is quite low. It has very low discriminatory power and adds to analyst fatigue.

Predictive ability of share price signals, an analyst perspective

In the previous representation, the focus was on examining whether rating changes were preceded by share price alerts. In this representation, the study aims to assess whether share price alerts are followed by a subsequent rating action. The idea is to understand the analyst point of view in using alerts to arrive at a meaningful analytical conclusion.

A total of 1,817 alerts were studied, of which 382 were positive and 1,435 negative alerts.

Alerts followed by rating movement (over the next 2 quarters), if any				
	No. of alerts	**Upward rating movement**	**Downward rating movement**	**No rating movement**
Significant rise in share prices (positive alert) – A	382	41	12	329
Significant fall in share prices (negative alert) – B	1435[6]	177	69	1192

---

[4] Alerts opposite to the rating movement are termed contra alerts. E.g., A positive alert against a rating downgrade is a contra alert.

[5] The results broadly remain the same even if we look at ratings by other CRAs for these instances

[6] (177+69+1192) 1438 ≠ 1435 as rating actions in both directions were observed against 3 negative alerts for an issuer. In this case, the rating actions were driven by regulatory guidance on non-cooperative clients.

Observation A: Out of 382 positive alerts, 41 were followed by actual upward rating action for the issuers.

Observation B: Out of 1,435 negative alerts, only 69 were subsequently followed by an actual downward rating action for the issuers. The findings indicate that the majority of the negative share price alerts did not result in corresponding rating downgrades, thereby highlighting the limitations of relying solely on share price movements as a predictor of deteriorating credit profile.

A total of 189 (177+12) alerts were identified as contra alerts, indicating that the stock price movements were in the direction opposite to the actual credit profile movement. These contra alerts highlight instances where the stock price movement did not align with the corresponding changes in the creditworthiness of the issuer.

		Valid alerts	Contra alerts	False alerts
		Directional change in credit profile	Contra change in credit profile	No change in credit profile
Total alerts	1817[7]	110	189	1521
		6%	10%	84%

Vast number of false alerts lead to noise

Out of the total alerts generated, only 6% accurately indicated a change in the credit profiles of the issuers. The remaining 84% were identified as false alerts. About 10% were identified as contra alerts.

> The high number of false and contra alerts underscores the challenges and limitations of only using share price movements as a reliable predictor of credit profile changes.

A total of 1,817 alerts were generated for 381 companies, resulting in an average of 5 alerts per company. Among these, 124 companies had 5 or more alerts generated per company, and 50 companies observed 10 or more alerts.

Multiple alerts per company, especially in cases where the efficacy of these alerts is inherently low, can contribute to information overload for analysts and hinder their ability to effectively interpret and utilise information, thus emphasising the need for a fundamental approach in assessing the creditworthiness of companies.

Can tweaking the framework lead to better results?

CRISIL Ratings explored various combinations of thresholds and time cut-offs to assess if they could enhance the effectiveness of the framework. By modifying the criteria for identifying significant movements and adjusting the time periods under consideration, CRISIL Ratings aimed to improve the efficacy of the framework in capturing meaningful signals. These included –

- Widening and narrowing the thresholds from the existing 5-15%
- Market cap-based thresholds — wider (lower) thresholds for small (large)-cap companies [8]
- Modifying the framework to include thresholds for long-term price change, such as a month

However, the findings indicated that the overall efficacy of the framework did not significantly improve for any of the scenarios tested. The adjustments made to the thresholds revealed the challenge of reducing false alerts while simultaneously improving the framework's ability to predict rating changes.

It was observed that there is a trade-off[9] between these two categories of alerts. This trade-off highlights the difficulty in striking the right balance between minimising false alerts and accurately indicating rating changes.

---

7 *(110+189+1521) ≠1817 due to presence of rating movements in both directions for 3 alerts against an issuer*

8 *Stock price movement of small cap companies is typically more volatile when compared to large cap companies*

9 *Numerous statistical studies cite an inverse relationship between type I (failure to predict change in the credit profile) and type II (false alerts) category of alerts, keeping other conditions constant. Hence, reduction in one type of error typically leads to increase in the other.*

Reasons for the limited efficacy of the share price signals

It is important to acknowledge that changes in equity prices are influenced by various factors, including the credit profile of an issuer. Also, rating actions can be driven by considerations that may not always be reflected in share price movements.

- **Fundamental difference between equity and debt analyses:** Equity analysis is primarily concerned with factors such as earnings per share and potential upside for equity holders. On the other hand, debt analysis focuses on the fundamental strength of the business, the robustness of the capital structure, and the ability to meet debt obligation on time. So, for instance, share price movement due to lower-than-expected earnings may not necessarily impact the credit profile of an entity that has low debt levels.

- **Impact of market sentiments/sectoral overhang:** Market dynamics, such as sell-offs or investments by institutional investors, and sectoral overhang can drive stock price movements without necessarily indicating a change in the underlying credit profile. These market-driven fluctuations may not accurately reflect the creditworthiness of individual companies. While comparing stock price movements to relevant indices helps to mitigate some of these market-related movements, it may not be possible to entirely eliminate the same.

- **Ratings are assigned on a through-the-cycle basis:** Credit ratings typically provide an assessment of the 'through-the-cycle' credit profile of an issuer, considering its overall financial health and creditworthiness over a long-term horizon, which may not change due to short-term fluctuations. In contrast, market valuations of stocks tend to reflect investor expectations of future earnings and can fluctuate in real time as these expectations are adjusted. For instance, a favourable commodity cycle will be reflected in the stock prices.
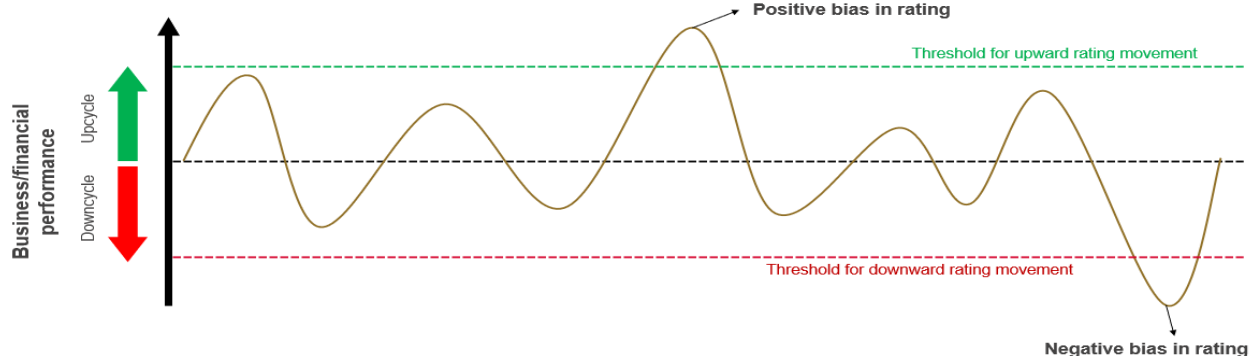
To ensure the ratings remain stable and provide a 'through-the-cycle' perspective, CRAs incorporate sufficient rating headroom into each rating. So, rating of an issuer operating in a commodity business will reflect its ability to withstand price fluctuations up to a certain level and may not move in tandem with the share price movement.

- **Steady credit profile for entity with strong parent/group/government support:** In certain cases, such as public sector undertakings (PSUs), credit profiles can be steady despite share-price underperformance, particularly when there is articulation of support by the parent (the government). This means even if a PSU is facing challenges in its business operations, the backing and support of the government (or parent/group) can provide stability to its credit profile.

- **Limited liquidity, information flow lower down the listing spectrum:** Although Indian equity markets are quite active, they are relatively shallow, particularly in the case of mid and small caps. Inconsistent and lower liquidity in these stocks can result in higher bid-ask spreads and impact costs (*refers to the price shift that occurs on placing a particular order*), leading to potential price distortions.

Furthermore, there is less research and analysis available on the stocks of mid-cap and small-cap entities, which further limits the ability of the share prices of these stocks to accurately reflect changes in credit profile.

B. Study on bond yields

Similar to the study on share price movements, another study was conducted on rated bonds under the portfolio of CRISIL Ratings to assess the effectiveness of major bond yield movements in indicating changes in the credit profiles of issuers. This study intended to test the hypothesis that significant downward movements in bond yields (corresponding to an increase in prices) could suggest an improvement in the credit quality of the issuer, potentially leading to a rating upgrade. Conversely, substantial upward movements in bond yields (resulting in a decrease in prices) for an issuer might indicate a deterioration in the credit profile, ideally followed by a rating downgrade.

The study conducted on the portfolio of debt-listed companies within CRISIL Ratings, which analysed about 25,000 bond trades[10] over a two-year time frame starting January 2021. It examined rating movements, including upgrades, downgrades, outlook revisions and rating watch actions.

	Jan 2021 – Dec 2022#
Number of companies studied	284 (debt-listed and cooperative issuers as on Dec 31, 2022)
Rating/outlook/watch changes (number of companies)	76
No rating/outlook/watch change (number of companies)	208
Definition of rating actions	Upgrades, downgrades, outlook revisions and change in watch

# This study period was selected to evaluate recent performance

A similar study was conducted for a different time period as well and the results were broadly the same.

Methodology

This study monitored the fluctuations in bond yields of the selected sample for two years starting January 2021. The objective was to identify any noteworthy volatility in yield spreads, particularly those exceeding the benchmark rate.

To determine significant yield movements, the analysis focused on consistent shifts in bond spreads[11], reflected in a substantial number of trades. These movements were considered significant when they surpassed the permissible range of spreads. The permissible ranges were established based on risk attributes of different categories of instruments available, such as bonds from PSUs, private issuers, and those with different credit ratings.

The permissible spread ranges were arrived at by using market data and multivariate regression

---
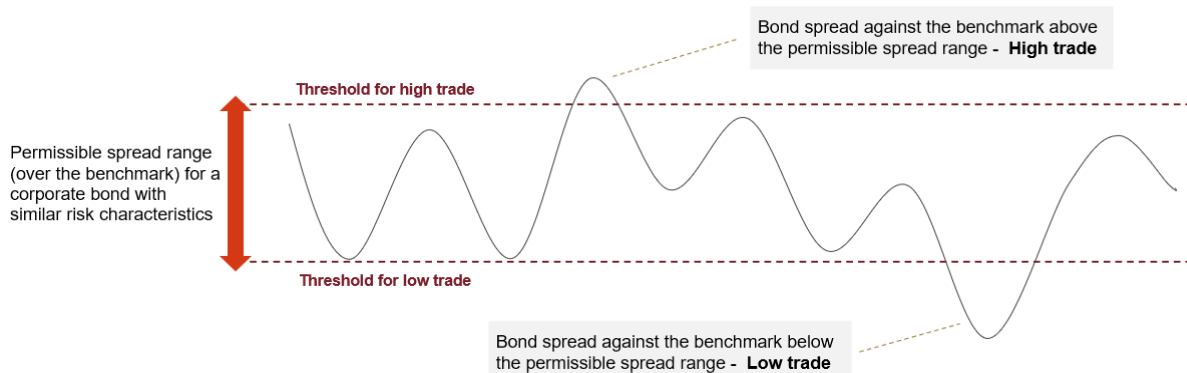
[10] Only AAA and AA rated trades were used for alert generation covering around 90% of the total volume of trades for entities rated by CRISIL Ratings. For trades within other rating categories, the sample size is very small to draw any significant conclusion

[11] Bond spread or yield spread is the difference in the yield on two different bonds – one bond being the benchmark bond in the study

Bond yields are influenced by multiple parameters, the most critical ones being the benchmark yield and credit risk of the underlying debt instrument.

Benchmark yield

Corporate bonds typically trade at a yield premium, or spread, over the risk-free government security (G-sec). This reflects the prevailing liquidity and mood in the market. Keeping other determinants of the yield constant, the market mood determines the extra spread between G-secs and the next best available bonds in the market — the AAA-rated PSU bonds. To account for the prevailing market mood, market participants use yields on 'AAA-rated', highly liquid, corporate bond papers from a frequent issuer as the reference benchmark, while modelling corporate bond yields. For a long time, bond papers issued by PFC (Power Finance Corporation) and REC (Rural Electrification Corporation) were considered the benchmarks. Recently, the market has started using issuances by the National Bank for Agriculture and Rural Development (NABARD) as the benchmark.

For the study, CRISIL Ratings has used NABARD yields as the benchmark to assess spreads on corporate bonds.

The benchmark yield signifies the lowest return that an investor is willing to accept on a corporate bond.

For instance, if a 10-year NABARD paper is trading at a yield of 7%, it indicates the benchmark yield of 7% for a bond with a similar tenure.

Credit risk

In addition to the benchmark yield, investors expect a premium to compensate for the credit risk they assume. When a debt instrument is rated BBB, investors typically demand a higher yield (reflecting the credit risk premium) compared with the benchmark yield. The spread over the benchmark yield is directly linked to the extent of credit risk. It is lower for modest credit risk and vice-versa.

CRISIL Ratings has utilised these two parameters to create a framework for modeling bond yield movements and set permissible ranges of yield spreads for different categories of bond trades.

For instance, for a benchmark yield of 7%, and accounting for credit risk premium of 75-100 basis points (bps) for a CRISIL AA-rated bond, the permissible range of yield would be 7.75-8%. The spread of 75-100 bps above the benchmark is referred to as the spread range for a typical AA-rated bond.

When a bond trades outside the permissible range, it signals a potential shift in its credit profile.

A high/low trade trigger is generated when a AA-rated, 10-year bond trades outside the permissible spread range of 75-100 bps. If the trade occurs below the benchmark yield plus 75 bps (say at 7.25%), it indicates a low trade. Conversely, if the trade occurs above the benchmark yield plus 100 bps (say at 8.25%), it indicates a high trade.

Adjustments to the permissible yield ranges

In addition to the factors mentioned above, bond yields are influenced by various other factors such as residual duration, demand-supply dynamics, liquidity, seniority, government support, taxability of cash flow and sector-specific considerations. These factors play a significant role in the pricing of debt securities.

- **Parentage (PSU/non-PSU):** Bonds issued by entities owned by the Government of India exhibit lower yields due to the expectation of sovereign backing and a lower perception of credit risk

- **Duration of the bond:** Investors usually require a higher premium for investments of a longer duration given the higher risk involved

- **Priority of the debt:** Subordination of debt has an impact on the spread. A lower priority of debt results in a higher expected yield on the bond, while a higher priority leads to a lower expected yield

- **Taxation of a bond's cash flows:** Tax-free bonds offer lower yields compared to bonds where the bond holder is subject to taxation on interest income and/or capital gains

The permissible spread ranges were adjusted to incorporate the aforementioned parameters as well.

For instance, in the case where the aforementioned CRISIL AA-rated bond had a duration of 20 years instead of 10, it would command a premium of, say, 25 bps to account for the higher duration risk, while keeping other risk factors unchanged. This adjustment aligns with market trends.

In this scenario, the permissible spread range shifts from 75-100 bps to 100-125 bps. Consequently, trades below the benchmark yield plus 100 bps would indicate a low trade (7.75%), while trades above the benchmark yield plus 125 bps would indicate a high trade (8.50%).

Alert generation framework

Consistent generation of high trades (low trades) would result in the generation of negative (positive) alerts, which served as indicators for potential changes in the credit profile.

Efficacy testing of the framework

The study compared alerts based on the framework with rating actions by CRISIL Ratings. Ratings act as a reference for indicating change in the credit profile of an issuer. Markets are expected to factor shifts in the credit profile in advance. The effectiveness of the alerts generated by the framework was tested by assessing whether rating actions were preceded by directional alerts in the preceding six months, indicating a similar change in the credit profile. In an ideal scenario, market signals would show up before rating actions — a positive alert before an upgrade and a negative alert before a downgrade.

The testing aimed to evaluate the predictive ability of bond yield movements and whether they could be used as a reliable indicator of potential rating actions.

The definition of two categories of alerts, 'failure to indicate change in credit profile' and 'false alerts', remains consistent with the methodology used for share price alerts.

Quality of alerts generated

Between January 2021 and December 2022, alerts totalling 3,644 were generated. Appropriate filters were applied to ensure the materiality and consistency of these alerts. For instance, an alert was generated only if a minimum number of trades were observed, confirming that the bond spread against the benchmark consistently exceeded the permissible corridor.

Item	Alerts	Number of entities the alerts pertain to
No alerts		194
Alerts generated	3,644	90
Positive	*2,338*	*44*
Negative	*1,306*	*60*

Of the 284 entities in the sample, 194 did not have any alerts. Among these entities, 79 had no trades at all for CRISIL Ratings-rated ISINs, indicating limited activity and illiquidity for those cases.

Results of the study: Relationship between rating changes and bond yield movements

Portfolio		Changes based on market signals	
		Rating change = Yes	**Rating change = No**
Actual	**Rating change = Yes** (103 rating changes for 76 companies) – (A)	6/103 rating changes (6%)	97/103 rating changes (94%)
	Rating change = No (416 reaffirmations for 208 companies)[12] – (B)	130/416 reaffirmations (31%)	286/416 reaffirmations (69%)

---

[12] For the 208 companies that went through no rating movement during the study period, two instances of reaffirmation each was assumed for the analysis as all outstanding ratings are typically reviewed once in every 12-15 months

Observation A: 103 rating changes against 76 companies

Out of the total instances of rating changes, directional alerts were observed prior to the rating change in six cases. However, in 97 instances, the rating change occurred without any corresponding alert being generated, thereby indicating failure to predict change in credit profile.

Interestingly, in the six successful instances where the alerts were able to predict a rating action, there were five contra alerts[13] accompanying each directional alert. This poses a challenge for analysts to differentiate between directional and contra alerts, even when yield movements do indicate a potential change in the credit quality.

The bond trade details for 103 rating movements observed for 76 companies are captured below:

Break-up of trading detail for companies with rating changes		
Category	Count of companies	Number of alerts
Had no trade	24	0
Had 1-10 trades	23	1
Had 11-20 trades	6	17
Had >20 trades	23	1342
Total	**76**	**1360**

The above table indicates illiquidity and lack of depth in the domestic bond market.

Of the 76 companies in which rating movements were observed (indicating a change in credit profile), major trading activity (more than 10 trades during the study period) was limited to just 29 out of 76 companies. – As a result, a significant concentration of alerts is observed with 10 alerts or more against 29 companies and only a single alert or no alert for the remaining 47.

Skewness of the Indian bond market

Scarce trading activity dilutes the case for relying solely on yield movements for credit decision-making.

Additionally, several trades observed during the study were sporadic and spread out over a long period, making it challenging to consider them as material.

Observation B: 416 reaffirmations for 208 companies

A significant number of false alerts were identified in relation to 130 instances of rating reaffirmation. Among these instances, positive alerts preceded almost half of the cases, suggesting an improvement in credit profile. However, it is important to note that majority of these instances involved CRISIL AAA-rated issuers, including PSU entities and large banking institutions. These entities already possess the highest rating, leaving no scope for further rating upgrades or actions.

Findings of the study indicate a limited capability of the framework to effectively indicate changes in credit profile.

---

[13] *Alerts opposite to the rating movement are termed contra alerts. E.g., A positive alert against a rating downgrade is a contra alert.*

Predictive ability of bond yield signals, from an analyst perspective

In contrast to the previous representation of the results, this section represents the point of view of the analyst.

Following table represents rating actions against the alerts generated.

		Alerts followed by rating movement (over the next 2 quarters), if any		
	No. of alerts	Upward rating movement	Downward rating movement	No rating movement
Significant fall in bond yields (positive alert) – A	2338	41	0	2297
Significant rise in bond yields (negative alert) – B	1306	224	5	1077

Observation A: In all, 2,338 positive alerts were generated, which indicate strengthening of the credit profile. Out of these, 41 were subsequently followed by an actual upward rating action for the respective issuers. However, no change in the credit profile was observed in 2,297 alerts (98% of total positive alerts).

Observation B: Out of the 1,306 negative alerts generated (indicated a weakening of the credit profile), only five were subsequently followed by a downward rating action for the respective issuers. Additionally, 224 contra alerts were observed, indicating that the bond yield movement was in the opposite direction to the actual movement in the credit profile.

		Valid alerts	Contra alerts	False alerts
		Directional change in credit profile	Contra change in credit profile	No change in credit profile
Total alerts	3644	46	224	3374
		1%	6%	93%

Out of the total alerts generated, only about 1% correctly indicated a change in the credit profile of the issuers. Around 6% of the alerts indicated a contrary change in credit profile, while the remaining 93% were false alerts, suggesting a change in the credit profile despite no actual change taking place.

Can altering the framework lead to better results?

Various combinations of yield determinants were used to assess their impact on the yield spread against the benchmark for a specific bond. To evaluate the effectiveness of the framework, the study was replicated for a different time period (2019-2021) as well. However, the results were on similar lines. The overall efficacy of the framework did not demonstrate significant changes across different combinations of yield determinants or time periods.

Through sensitivity analysis, it was observed that there exists a trade-off between improving the ability of the bond yield framework to predict credit movements and the generation of false alerts, which can introduce noise into the analysis.

Like share price, movement in bond yields do not provide accurate indication of changes in credit quality.

Reasons for the limited efficacy of the bond-yield signals

- **Shallowness of the bond market:** In contrast to equity markets, the Indian bond market is characterised by lack of depth and liquidity. It is dominated by AAA/AA-rated issuers, specifically PSUs and financial sector entities.

The limited market composition hinders the ability of bond yields/prices to effectively indicate changes in the credit profiles of all issuers, particularly as we move down the credit curve, such as those in the A category. Besides, the market typically follows a hold-to-maturity approach leading to very low number of trades.

For instance, on an average, daily trades remain low at 800-850 compared with outstanding instruments, which were about 32,000 (~6,000 issuers) as of June 2023[14]

Minimal daily trades vis-a-vis total instruments outstanding

32000

850

Instruments outstanding   Average daily trades
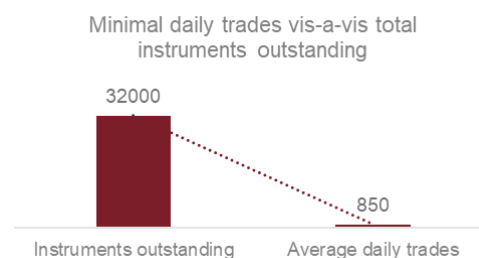
- **Spreads can be impacted by non-credit factors:** The study incorporates adjustments for various determinants of bond yields, including the rating, residual maturity, subordination, market liquidity, structure (such as guarantee), and tax status. These adjustments are utilised to calculate the credit risk premium that, in turn, generates alerts.

However, it is important to acknowledge that these adjustments, which are derived through a combination of logistic regression and expert judgment, may not always align consistently with market behaviour. For instance, newer instruments/structures/issuers typically carry a premium and the yield may not reflect its true credit quality.

- **Breach of concentration limit leading to higher yields:** Investors often have concentration limits in place, which determine the maximum percentage of their total exposure that can be allocated to a single issuer. If these limits are breached, investors may require a premium to invest in the securities, resulting in higher yields — without any change in the credit quality.

- **Sectoral perception leading to sporadic yields:** Bond yields are influenced by the market's risk perception associated with a specific trade. That, in turn, is often influenced by the overall sector sentiment and can sometimes result in abnormal yields without any actual change in the fundamental credit quality of the issuer.

For instance, back in 2018, in the event of a default by a non-banking financial company (NBFC), the entire NBFC sector experienced higher yields across trades. However, many of the entities had robust fundamentals and/or the backing of a strong parent, and the change in yield did not reflect their credit profiles.

---

[14] *Source: SEBI, RBI bulletin*

Conclusion

Both market signals, or movements in share price and bond yields, can provide valuable insights into market perception. But they may not be reliable predictors of changes in credit profiles.

This is because market movement is not always linked to credit factors, and additional challenges such as market illiquidity further limit the predictive ability of these indicators.

While markets are often credited with predicting major developments, our study does not support this argument.

CRISIL Ratings' study found that both bond yields and share prices had an accuracy rate around 50% or lower, which is essentially no better than a random chance. This implies that in about half of the cases, these indicators may predict a shift in credit profile, while in the other half they fail to do so.

Given their low discriminatory power and at times, contra signals, it is difficult for an analyst to incorporate these inputs. It may result in information overload, analyst fatigue, and confusion due to the noise it generates.

For credit monitoring, market-led signals can be used as a supplementary input alongside fundamental analysis.

As the markets deepen, the effectiveness of market signals in credit monitoring may improve.

Annexure

Share price alert methodology

o **Condition for a positive alert:** If the share price increases (with respect to the relevant index) by 5-15% over 1-5 days, consistently.

o **Condition for a negative alert:** If the share price decreases (w.r.t the relevant index) by 5-15% over 1-5 days consistently.

Thresholds for the study were determined by analysing share price movements of a sample of companies over a 10-year period, relative to the relevant index.

Rationale for the methodology

The purpose of selecting thresholds was to identify significant changes in share prices that are considered material, typically ranging between 5% and 15%, and consistently observed over 3-5 days. This approach aimed to capture potential shifts in share prices that warrant further examination and analysis.

A time cut-off of five days or less was utilised to capture sudden fluctuations in stock prices. Longer time periods, such as a month or two, were not considered because such information is expected to be captured in the quarterly financials. The idea was to look at immediate market movements and whether they translate into a credit rating change in the near term.

Selection of these thresholds was based on a combination of historical data and expert judgment. To ensure robustness of the approach, sensitivity analysis was conducted to assess the impact of adjusting the thresholds. However, the analysis did not result in any significant change in the overall outcome, confirming the stability of the chosen thresholds.

Lowering the thresholds from current levels will allow capture of market signals in a more detailed and granular level. But this approach would increase the likelihood of noise, leading to a higher number of false alerts. Conversely, using higher cut-offs would result in fewer triggers and a lower number of false alerts. However, this approach may overlook important red flags that the equity markets could potentially indicate for an issuer. Striking the right balance in choosing the thresholds is crucial to ensuring meaningful alerts without being overwhelmed by irrelevant noise.

Indices used in share price methodology

Sr. No.	Market capitalisation (M)	Index
1	Less than Rs 5,000 crore	Small cap index (BSE Small Cap)
2	In between Rs 5,000 and Rs 20,000 crore	Midcap index (Nifty Mid Cap 100)
3	Greater than Rs 20,000 crore	Large cap index (Nifty Large Cap 100)

About CRISIL Ratings Limited (A subsidiary of CRISIL Limited, an S&P Global Company)

CRISIL Ratings pioneered the concept of credit rating in India in 1987. With a tradition of independence,

analytical rigour and innovation, we set 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 35,000 large and mid-scale corporates and financial institutions. We have also instituted several innovations in India in the rating business, including rating municipal bonds, partially guaranteed instruments and infrastructure investment trusts (InvITs). CRISIL Ratings Limited ("CRISIL Ratings") is a wholly-owned subsidiary of CRISIL Limited ("CRISIL"). CRISIL

Ratings Limited is registered in India as a credit rating agency with the Securities and Exchange Board of India ("SEBI").

For more information, visit www.crisilratings.com.

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 through businesses that operate from India, the US, the UK, Argentina, Poland, China, Hong Kong, UAE and Singapore.

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.

For more information, visit www.crisil.com

Connect with us: LINKEDIN | TWITTER | YOUTUBE | FACEBOOK | INSTAGRAM

CRISIL Privacy Statement

CRISIL respects your privacy. We may use your personal information, such as your name, location, contact number and email id to fulfil your request, service your account and to provide you with additional information from CRISIL. For further information on CRISIL's privacy policy please visit www.crisil.com/privacy.

Argentina | Australia | China | Hong Kong | India | Japan | Poland | Singapore | Switzerland | UAE | UK | USA

CRISIL Limited: CRISIL House, Central Avenue, Hiranandani Business Park, Powai, Mumbai – 400076. India

Phone: + 91 22 3342 3000 | Fax: + 91 22 3342 3001 | www.crisil.com

in /company/crisil   @CRISILLimited   f /CRISILLimited   /user/CRISILLimited   /lifeatcrisil

CRISIL
Ratings