SUSTAINABILITY RATINGS AND CORPORATE CONTROL: DEBACLE OF SHAREHOLDER OVER STAKEHOLDER THEORY

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Abstract

Corporate sustainability rating is frequently observed by different stakeholders, thereby finding interest in academic studies as well. Shareholders of sustainable-companies respond to different types of stock market news, be it financial or non-financial news. Announcements relating to ratings obtained by sustainability-compliant businesses appear to create anticipation in the mind of the investor. If these announcements are viewed by investors with interest, then it can have a greater implication for corporate governance and control and the corporate leaders can find a clear path to resolve the much debated "shareholder" versus "stakeholder" view in decision-making. This paper aims to explain whether or not the declaration of sustainability ratings contributes to the stock market reaction in emerging markets such as India. Short-run event analysis was carried out on a set of selected BSE listed companies following sustainable practice (2017-2019) and the entire data set was split into categories of the upgrade, downgrade, no change, and no ratings. The study results show that the announcement of sustainability ratings is not regarded by investors with a great deal of interest and there is inherent indifference to such news in the stock market. These findings are relevant for stock exchanges, investors, and corporate control as it raises a serious issue of rethinking stakeholder awareness levels, which in an emerging economy such as India currently seem to be in a nascent stage. In order to meet the stakeholders interested in the process of business becoming sustainable corporate leaders through proper governance should explore ways and means to approach sustainability in a more systematic way.

Keywords: Corporate Control, Conflict of Interest, ESG Ratings, Event Study, Shareholder Theory, Stakeholder Theory

Authors' individual contribution: Conceptualization – S.Y.; Methodology – C.M.; Software – C.M.; Validation – S.Y.; Formal Analysis – C.M.; Investigation – S.Y.; Writing – Original Draft – S.Y.; Writing – Review & Editing – S.Y.; Visualization – C.M.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

As reported in the Annual Impact Investor Survey conducted by Global Impact Investing Network (GIIN) in June 2020, the current market size for sustainable investment is USD 715 billion. Sustainability as a concept is gaining traction in corporate culture, not to ignore an ongoing debacle

over the excessive importance provided by management to corporate social responsibility/ corporate sustainability. There are several schools of thought to build this debacle *viz.,* "shareholder theory" versus the "stakeholder view". By arguing that managers are the shareholder of the company, Friedman had established a shareholder theory debate. Agents should therefore function in the best interest of their principal, that is to say, the shareholders. He also argues that managers should not engage in CSR activities; in fact, when tax and other laws are developed, it should be left to the government to implement them. Thus, as per this theory, the ultimate aim of the companies is to enhance the shareholders' wealth and then all financial decisions would only have such strategy in mind (Danielson, Heck, & Shaffer, 2008). The shareholder principle emphasises the maximisation of short-term profits, while respecting some degree of abuse by stakeholders (Danielson et al., 2008).

In contrast, as suggested by Freeman (1984) stakeholder theory relies on the premise that they neglect environmental concerns in the process when business strategists focus all their energies on the benefit of one or more stakeholders. Stakeholder theory has also been supported by other proponents in the past (Ullmann, 1985; Ruf, Muralidhar, Brown, Janney, & Paul, 2001; Chih, Chih, & Chen, 2010; Ziegler, 2012; Roberts, 1992). While primary stakeholders, i.e., shareholder's active and continuous participation is necessary for he survival of a company, the interests of secondary stakeholders should also be met, although they are not necessary for the survival of the company (Clarkson, 1995). Other advocates of stakeholder theory promote a resource-based perspective (RBP) and contend that corporations go well beyond their limits to appease stakeholders and seek to achieve sustainable competitive advantages by working on unique and special resources that do not have a perfect substitute for the market (Lourenço, Branco, Curto, & Eugenio, 2012). As highly reputable organizations can improve relationships with external stakeholders such as bankers, suppliers, and competitors, customers, investors, these tools are a corporate reputation that pays off in the long run (Roberts & Dowling, 2002; Orlitzky, Schmidt, & Rynes, 2003).

We begin our research on the fundamental premise that there is a value in being sustainable and can shareholders find some reaction to this value? Is sustainability regarded with concern by shareholders? If yes, then we can probably give a case in support of the shareholder theory.

Corporate sustainability (CS) has evolved over the years as a concept and is closely connected to corporate social responsibility (CSR) with some differential threads between the two. CS encompasses CSR, and both use dimensions like economic, social, and environmental (Panapanaan, Linnanen, Karvonen, & Phan, 2003). While CSR views economic, social, and environmental dimensions as independent dimensions for the human benefit, CS views these as an integrated approach (Montiel, 2008). Another difference lies in the goals of these two; CSR aims to establish a conversation between humans and the environment, CS aims to achieve sustainability of the corporation as a viable business entity. CS is being used as an instrument to bring

balance between the immediate needs of the people and the future needs, on the other hand, CSR is simply providing a balance of economic, social, and environmental concerns in an intermediate stage (Kaptein & Wempe, 2002). This conceptual inter-play of two concepts is necessary to have a clear view from the theoretical and empirical understanding of the subject since several academic studies have used these two concepts interchangeably. CSR, sustainable development, triple bottom line, non-financial and environmental, social and governance (ESG) are alternative reporting terminology used in literature (Bebbington, 2001; Adams & Narayanan, 2007).

2. LITERATURE REVIEW

We are now discussing the idea further, based on a philosophical basis; is there any benefit that accrues to businesses as a virtue of being sustainable? There are many studies in this area that have drawn the attention of scholars, be it the extent or degree of coverage across nations or various aspects of sustainability. The degree of interest that is developing in this area is very important but there does not seem to be a firm consensus on the benefits of being sustainable for companies.

There is plenty of literature supporting additions to and deletions from the sustainability index as the sustainability front achievement of a business, Oberndorfer, Schmidt, Wagner, and Ziegler (2013); Cheung and Roca (2013); Lackmann, Ernstberger, and Stich (2012); Cheung (2011); Robinson, Kleffner, and Bertels (2011); Consolandi, Jaiswal-Dale, Poggiani, and Vercelli (2009). These studies are based on the premise that positive news (index inclusion) results in positive CARs and thus, negative news (index exclusion) could result in negative CARs. They emphasize the treatment of symmetrical but opposite directional response of investors to sustainability-related news, for example, index inclusion/exclusion. This premise looks natural to the readers, but we hold a slightly different view and differentiate our study from prior studies in a number of ways. First, we take participating in the process of sustainability ratings by companies as a proxy for the intentions of companies towards being sustainable. Second, we challenge the treatment of symmetrical but opposite directional response of investors to sustainability ratings as we believe that rating downgrade is conditional on initial ratings achieved in the previous rating cycle. Thus, we posit that upgrade and downgrade should not be seen from the single lens. Further, we argue that firms have already followed best practices and incurred costs to achieve previous ratings, and expected future costs and benefits of such sustainability actions were incorporated into stock prices at that time. When such a firm downgrade in ratings, it will not be able to reap the potential future benefits from these previous costs anymore, as now they become sunk costs. Thus, as an investor, this downgrade may be an indicator of the failed costs of the past. We thus hypothesize that initial ratings may receive positive or negative CARs, but later downgrade shall receive only negative reactions of investors. Thus, this study adds to the existing literature as well as fills a gap by adding a novel theoretical insight.

The current study seeks its motivation from the very fact that literature is divided on the crucial issue of being sustainable or not. We build on the value relevance of sustainability ratings as perceived by investors as sustainability ratings are based on comprehensive sustainability performance evaluation of top-performing "best in class" firms in their industry. We, therefore, give due weightage to sustainability ratings as an indicator of sustainability inclination of firms and we analyze stock market price reaction to such ratings using the event study approach.

At the outset, we assume several possibilities as a result of these announcements becoming public. When such information reaches the stock markets, this can lead to a permanent increase in demand for stock prices; downward sloping demand curve hypothesis, (Shleifer & Vishny, 1986), or there can be a temporary increase in demand for prices of stocks; price pressure hypothesis (Harris & Gurel, 1986). It can also decrease information asymmetry problem in the stock market by increasing investor's awareness during and around the rating announcements; information cost hypothesis (Merton, 1987) or these rankings could give a sense of future direction to the investors about the company's movement as private information becomes public at the time of the announcement; signaling hypothesis (Jain, 1987; Dhillon & Johnson, 1991; Denis, McConnell, Ovtchinnikov, & Yu, 2003).

3. RESEARCH METHODOLOGY

3.1. ESG ratings as a measure of environmental performance in India

How green is this company? If we are remotely associated with a company, which variable should we study to know the answer to this question? There is a need for a holistic mechanism in place for evaluating the companies on the ecological front. Rating agencies are coming up in a big way as they have started to assume the role of a catalyst between investors and companies (Schaefer, 2005). Two factors have led to the surge in importance of rating agencies in recent times, one, market-based financial system and two, enforcement of social, environmental, and corporate governance regulations (Ferri & Liu, 2005). Companies are placing value on public image and reputational advantage that accrues to them by making the investment in social responsibility and getting rankings (Adam & Shavit, 2008).

In this study, we use ratings of the GreenCo Rating system, which employs a holistic framework for evaluating the environmental friendliness of the companies using a life cycle approach. Life cycle approach of GreenCo is based on 1) product design; 2) materials used; 3) procurement; 4) vendor management; 5) logistics; 6) packaging; 7) manufacturing; 8) distribution; 9) product use; 10) disposal and recycling. Rating once assigned remains intact for a minimum period of 3 years in case of new plants and 2 years in case of new facilities for both manufacturing facilities and service sector units. Parameters that are employed by GreenCo while rating companies are *energy efficiency* (150 points), *water conservation* (100 points), *renewable energy* (100 points), *GHG mitigation* (100 points), *waste management* (100 points), *material conservation, recycling and recyclability* (100 points), *green supply chain* (100 points), *product stewardship* (75 points), *life cycle assessment* (75 points), *green building features, biodiversity & innovation* (100 points). GreenCo rating system of Confederation of Indian Industry aspires to be the Indian industry's benchmark for environmental performance in India.

Companies get "world class, platinum" rating in case they score more than 750 points, second-best being "national best, gold" with 650-749 points, followed by "silver" with 550-649 points, "bronze" with 450-549 points and companies with 350-449 are called "certified". No rating is given to companies scoring less than 350 points out of a total of 1000 points. The entire rating approach is based on professionally managed procedures/reviews at all stages. GreenCo follows a time-based and transparent system of rating the companies by conducting two days advance training program for the companies ahead of the rating, and then a detailed questionnaire is provided to the company to understand the data/documentation requirements. After that, there are handholding visits ahead of final site visit and assessment. The assessment team reports their findings to a panel of judges for review and then the ratings are awarded to the unit.

During the three years of the rating period, if a company has made a considerable improvement on rating parameters, these companies can apply for re-assessment. Alongside, sustenance review is done every year through a questionnaire where GreenCo suggests areas of improvement to the company. Green co assessor panel is an accomplished team of senior industry professionals accredited for GreenCo Assessment and trained on the revised guidelines once a year. These best practices of GreenCo has made it receive recognition by appearing in "Intended Nationally Determined Contributions", submitted to the United Nations Framework Convention on climate change, where it proposes India's intention to reduce GHG emission intensity of its GDP by 33% to 35% by 2030 from 2005 levels. United Nations Industrial Development Organization has featured GreenCo in its 50th anniversary publication. The impact of GreenCo has so far been substantial. Its success is also getting translated into the benefits that accrue to the large GreenCo rated companies in terms of savings to the extent of Rs. 1257 crores in 2018-19. These saving were a result of GHG mitigation, carbon sequestration, water-saving, energy-saving, material recovery, reducing the environmental footprints. GreenCo Rating score card so far since its inception says there are at present 550 companies working on GreenCo ratings, out of which 265 are GreenCo rated companies, comprising 56 railway units. There are at present 7 GreenCo forums in various cities in India, where 500 companies participate. SMEs are also finding GreenCo attractive and 100 SMEs are working on rating and 68 GreenCo rated SMEs are in existence now. These SMEs have saved approximately Rs. 19 million per year. Companies are increasingly participating in GreenCo ratings as they see environmental benefits accruing to them by following such practices as desired by GreenCo. So far, 751 MWP of installed renewable energy is in

use, with 256 Million units of electrical energy savings and 1 million ton of CO_2 eq GHG mitigation. Approximately 17 million litres of rainwater is harvested within and beyond the fence. 39 companies are using life cycle environmental impact analysis (LCA) and this has saved 1 million tons of materials.

GreenCo is at the forefront of generating value for the industry and environment, it has been successful at linking environmental sustainability with cost benefits for the industry. Tangible value in terms of cost benefits and the green image has been one of the primary benefits for the industry for taking the GreenCo rating system seriously.

Table 1. Growth in the number of registered and rated companies by GreenCo (2011-2019)

Year	Registered	Rated
2019	347	260
2018	315	224
2017	224	138
2016	145	79
2015	87	50
2014	56	28
2013	35	11
2012	17	4
2011	12	0

Source: GreenCo Rating System (http://www.greenco.in/)

3.2. Event study methodology

Ratings for the period of June 2018-June 2019 were announced on 5 July 2019 (day 0). 260 companies participated for the same and amongst them, 58 got rated. These 58 companies comprised of such companies that had more than one rating assigned, and some which were not listed. After applying a filter on the singling out companies getting multiple ratings and removing unlisted companies, the final sample consisted of 14 companies.

Ratings for the period of June 2017 to June 2018 were announced on 27th June 2018 (day 0). 224 companies participated, 56 got rated, and after singling out multiple ratings and unlisted companies, the final sample consisted of 12 companies.

Ratings for the period of June 2016 to June 2017 were announced on 23rd June 2017 (day 0). 138 companies participated, 85 got rated, and the final sample consisted of 26 companies, after filtering out multiple ratings and unlisted companies.

We employ three year's dates, i.e., 2019, 2018, and 2017 for the current study as we want to test a change in rating effect from year on year. To test if it pays to be sustainable, we use ratings achieved and its reflection in share prices of the companies rated. The event study methodology is adopted here to establish linkages between change in share price and ratings. Event studies have always been popular in finance literature due to the usage of market-determined share price as a proxy for firm performance rather than accounting-based measures of profit which are sometimes biased based on the manipulation of accounting procedures (Benston, 1982). We use the daily share prices of the companies in the data set for three years as well as the daily prices of BSE Sensex as a proxy for the market during the same time frame. Both daily

prices of the company and BSE Sensex were converted into returns by using the formula:

$$[(Current\ value - Previous\ value)/ \atop Previous\ value] * 100 \qquad (1)$$

So, we have a daily return series of 14 companies (2019), 12 companies (2018), and 26 companies (2017), alongside daily return series of BSE Sensex for the same time frame. Day 0 or date of announcement is 5th July for 2019, 27th June for 2018, and 23rd June for 2017.

An event study is based on several assumptions, one of them being the efficient markets hypothesis, which says that stock prices are a true reflection of relevant and unanticipated news (Bromiley & Marcus, 1989). Stock prices react to news related to the company and it quickly gets incorporated in the short-run. This assumption works well in case of a short event window and does not work on a lengthy event window. A longer event window can reduce the power of the test statistic by giving false inferences about the significance of an event (Brown & Warner, 1980; 1985). Dann, Mayers, and Raab (1977) observed that the release of firm-specific information gets reflected in the stock prices within 15 minutes of its release. Thus, a short event window is suitable for capturing the significant effect of an event (Ryngaert & Netter, 1990). The length of the event window also depends upon the likeliness of information leakage related to the event, if there is such possibility, then the event window should begin prior to the actual date of the announcement, so as to capture significant abnormal returns (Ryngaert & Netter, 1990). On these considerations, we use a short event window of -10 to +10 days around day zero, then further divide it into shorter event windows like -5 to +5, and -2 to +2. Here, day zero is the date of announcement of GreenCo ratings for 2019, 2018, and 2017. In some cases, it may so happen that the market may anticipate the results of ranking in advance of the announcement date, so, we use -10, -5, and -2, to capture this information leakage (Lynch & Mendenhall, 1997). We include prior as well as post-trading days in the event window in line with (Dasgupta, Laplante, & Mamingi, 2001), as GreenCo ratings is a regular phenomenon that happens year after year ever since 2011, and we expect anticipation building up prior to the rating announcement.

The second assumption is about abnormal returns, i.e., the difference between actual return and the expected return. Abnormal return signifies the stock market's reaction to new information that was previously unknown, based on signaling hypotheses.

Third, there should be no confounding events around event day (or day 0) like stock splits, bonus issues, declaration of dividends, the announcement of an impending merger, the announcement of unexpected earnings, change in the board of directors, etc. As the dataset in the current study comprises large-cap diversified multinational firms that have a higher possibility of confounding effects of such events happening more frequently, so we eliminated such firms from the dataset in the initial screening.

We employ the market model as it provides the best linear unbiased estimators for forecasting expected returns, at the same time, it controls for varying growth rates of each company as well as the varying response of its own returns in relation to stock market movement. The presence of different alphas of each company establishes varying growth rates and the presence of different betas for each company tells varying responses (Khanna, Quimio, & Bojilova, 1998; Arora, 2001). These observations were also seen during the data analysis.

We selected 150 trading days prior to day zero since stock trading days in a year excluding weekly offs and other holidays come out to be approximately 250. This length of 150 trading days for the market model accounts for seasonal cycles that the company may go through during this time frame; and did not take a longer time frame as there is a possibility of changes in the company's operations and profitability, etc. This estimation window selection goes in line with (Gupta & Goldar, 2005).

We use the ordinary least squares method of estimation as the abnormal stock returns are positive as well as negative during the event window. Since the GreenCo ranks the companies in some order and there is no positive or negative ranking, we use a linear scale in OLS. It is the stock market which is going to assign a positive or negative value to the ranking, or improvement or degradation of ranking from the previous year. We expect one of these results, a positive reaction versus negative reactions or no reaction at all.

The market model assumes a linear relationship between the returns of any security and the returns of the market portfolio. Market model over -150 days, for estimation window or pre-event window to know alpha and beta of companies that were rated in all three years, is defined as follows:

$$R_{i,t} = \alpha_i + \beta_i R_{mt} + \varepsilon_{i,t} \qquad (2)$$

here, $E(\varepsilon_{i,t}) = 0$ and $var(\varepsilon_{i,t}) = \sigma_{ei}^2$; $t =$ time index; $i = 1,...N$ denote securities; $R_{i,t} =$ return on security *i*. $R_{mt} =$ return on market portfolio; $\varepsilon_{i,t} =$ random error term associated with security *i.*

Using alpha and beta derived from the market model, we then estimate abnormal returns for the event window as:

$$AR_{i,t} = R_{i,t} - \alpha_i - \beta_i R_{mt} \qquad (3)$$

Abnormal return here are calculated on an out-of-sample basis, being the disturbance term of the market model. As per (MacKinlay, 1997), abnormal returns will be jointly normally distributed with a zero conditional mean and conditional variance $\sigma^2(R_{i,t})$ in the short run and $\sigma^2(R_{i,t}) \to \sigma_{ei}^2$ in case of the long run, and these returns are conditional on the event window market returns under the null hypothesis (H_0). We then obtain CAR (cumulative abnormal return) by adding subsequent abnormal returns of security *i*, to test persistence[1] effect during the -10 to +10 event window. CAR for security *i* for the event window, where T_1 is -10 day and T_2 is +10 day, is:

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[1] Persistence is the tendency of a security's price to continue moving in its present direction either up or down.

$$CAR_i(T_1, T_2) = \sum_{T_1}^{T_2} AR_{i,t} \qquad (4)$$

where variance is $\sigma_i^2(T_1, T_2) = (T_2 - T_1 + 1)\sigma_{ei}^2$.

We use the T-test to test the null hypothesis (H_0) of zero cumulative returns and its variance. We then aggregate cumulative returns across the *N* scripts and obtain average cumulative abnormal returns as follows:

$$CAAR_i(T_1, T_2) = 1/N \sum_{i=1}^{N} CAR(T_1, T_2) \qquad (5)$$

where variance of CAAR is $var(CAAR(T_1, T_2)) = 1/N^2 \sum_{i=1}^{N} \sigma_i^2(T_1, T_2)$.

4. RESULTS

We present the results of detailed analysis in this section, category wise and testing various hypotheses as we proceed.

Category 1: Overall ratings received by 26 companies in 2017, 12 companies in 2018, and 14 companies in 2019

Hypothesis 1 (H1): Higher overall GreenCo ratings do not give significant short-term abnormal returns/cumulative average abnormal returns.

Table 2 (see Appendix) shows that for all three years, results are not significant as seen from *t* statistic which is less than the critical value at 5% and 1% level of significance. Thus, we cannot reject the *H1*.

Category 2: Positive/negative abnormal returns/cumulative average abnormal returns around day 0.

We divide companies into two sets, one set comprising of those companies that generate positive abnormal returns/cumulative average abnormal returns around day 0 and the second set of those companies that generate negative abnormal returns/cumulative average abnormal returns around day 0. So, we have 6 (+ve) and 20 (-ve) for 2017; 3 (+ve) and 10 (-ve) for 2018; 8 (+ve) and 7 (-ve) for 2019. First, we test the second hypothesis (*H2*) which is formulated as:

Hypothesis 2 (H2): Positive returns/cumulative average abnormal returns around day 0 are not significant in the short-run.

From Table 3 (see Appendix), we find that although there are positive abnormal returns around the event day in all three years, but they are not significant at 5% and 1% level of significance. Thus, we cannot reject the *H2*. If we see the positive percentage of the total number of companies rated, we find that it is 24% in 2017, 24% in 2018, and 53% in 2019. This percentage increase shows some move towards positive reaction over the last three years, although insignificant. We then formulate and test the following hypothesis:

Hypothesis 3 (H3): Negative abnormal returns/cumulative average abnormal returns around day 0 are not significant in the short-run.

From Table 4 (see Appendix) we find that although there are negative abnormal returns around the event day in all three years, but they are not significant at 5% and 1% level of significance. Thus, we cannot reject the *H3*. If we see the negative percentage of the total number of companies rated,

we find that it is 76% in 2017, 76% in 2018, and 47% in 2019. That shows, more positive reaction over the last three years, although insignificant. A trend is observed towards a more positive reaction to GreenCo ratings over the past three years, but there is no evidence to support these positive/negative returns around the event day are significant.

Category 3: We further divide the sample into two sets as:

1) Year of 2018 (The reference year is 2017):
• Set of companies that witnessed upgrade in their ratings from the previous year (7 companies);
• Set of companies that witnessed downgrade in their ratings from the previous year (6 companies);
• Set of companies that witnessed no change in their ratings from the previous year (3);
• Set of companies that received no rating at all this year, i.e., 2018 but were rated in the previous year, i.e., 2017 (17).

The following hypotheses were formulated and tested for 2018 and 2019.

Hypothesis 4 (H4): Abnormal returns/cumulative average abnormal returns due to upgrade in GreenCo ratings around day 0 are not significant.

Hypothesis 5 (H5): Abnormal returns/cumulative average abnormal returns due to downgrade in GreenCo ratings around day 0 are not significant.

Hypothesis 6 (H6): Abnormal returns/cumulative average abnormal returns due to no change in GreenCo ratings around day 0 are not significant.

Hypothesis 7 (H7): Abnormal returns/cumulative average abnormal returns due to no ratings in GreenCo ratings around day 0 are not significant.[2]

From Table 5 (see Appendix) we find that the results are not significant at 5% and 1% level of significance, thus we cannot reject *H4, H5, H6*, and *H7*. Although a closer look at the results provides some interesting insights.

In 2018, upgrade in rating receives a green signal in the market, as we see that ARs and CAARs in -10 day to day 0, remains negative but turn positive post rating announcements (from day 0 to +10 days); it shows that the market assigns a positive signal to ratings upgrade. For rating downgrade, we find (-10 days to day 0), show negative ARs and CAARs which continue to be so even after day 0 to +10. We do sense signalling hypothesis playing its role here in case of upgrade and downgrade of ratings, although these signals are not statistically significant. The price pressure hypothesis does show some effect here again but it is also insignificant from a statistical point of view, as there is a temporary change in prices. The downward sloping demand curve hypothesis cannot be tested here as it requires a long-run event study. Also, we can test the price reversal effect in case the scope of this study would cover a longer event window.

For no change in rating, we do not find any clear indication in terms of positive or negative ARs,

but in case of CAARs, there is a definite and clear change from positive CAARs (-10 days to day 0 window), and their conversion into negative CAARs immediately on day 0 and thereafter up to + 10 days of announcement. CAARs give the magnitude of ARs over the entire event window. We infer here that there was an anticipation effect as the market was anticipating the ratings to improve for firms which were rated last year (in 2017) but was disappointed and there was a loss in positive momentum after witnessing that there was no change in ratings. No clear pattern emerges for ARs when there is no rating given to the firms, but we find that CAARs turn from positive (-10 to 0) to negative (0 to +10), again the market reacts negatively to those firms which have not been rated at all. Moreover, the day of change impact can be clearly seen on day zero for upgrade/no change/no ratings and no clear day of change can be observed in case of the downgrade. It is also quite clear that stocks that are rated higher, earn higher returns; stock which was expected to get a higher rating and did not meet market expectations, earn negative returns on the backing of market disappointment and those stocks which could not grab any rating at all, were rejected by the market as reflected in negative CAARs.

In a nutshell, the market does assign some weightage to rating announcement, but from a statistical point of view, the results are insignificant. We cannot produce any conclusive evidence in this case. We cannot reject the hypotheses formulated (*H4, H5, H6, H7*), although the trend was in the same direction as anticipated.[3]

2) Year of 2019 (The reference year is 2018):
• Set of companies that witnessed upgrade in their ratings from the previous year (14 companies);
• Set of companies that witnessed downgrade in their ratings from the previous year (1 company);
• Set of companies that witnessed no change in their ratings from the previous year (4);
• Set of companies that received no rating at all this year, i.e., 2018 but were rated in the previous year, i.e., 2017 (6).

We again test all four hypotheses, this time for the year 2019, taking 2018 as a reference year. From Table 6 (see Appendix), we find that the results are not significant at 5% and 1% level of significance, thus we cannot reject the *H4, H5, H6, H7*. There are several insights for 2019 as well.

In all four categories, ARs do not convey a clear pattern, either up move or down move, both before and after the event, so we are not in a position to comment on ARs. CAARs in the pre-event window, i.e., -10 day to day 0, in all four categories are clearly negative, turn positive after absorbing the rating announcements. It seems quite strange to get a positive reaction to both upgrade and downgrade of ratings, but we may ignore the downgrade category as it comprises only one company in 2019. There was no anticipation effect as the markets were not experiencing an up move in the -10 day to 0-day event window, the day of change impact can be

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[2] Suppose a company A got gold rating in 2018 and silver rating in 2017, we put this company in upgrade category in 2018 sample, and similarly, if this same company A got silver rating in 2019, we put this company in downgrade category in 2019 sample. If company B got bronze in 2017, and bronze in 2018, we put this company B in no change category. Finally, if a company C got some rating either of gold, silver, bronze, platinum rating in 2017, but could not get any rating in 2018, we put this company C no rating category. The same criteria is applied for 2019 keeping 2018 as reference year.

[3] This is a Type 1 error: when the threshold for rejection of the null hypothesis (H_0) is P 1⁄4 0:05, an investigator is said to accept the 5% level of significance. This means that in tests where the computed value of the test statistic is equal to or barely exceeds the critical value, the decision to reject the null hypothesis (H_0) is probably correct 19 times out of 20 (or 95% of the time). Five per cent of the time there is a risk of rejecting the null hypothesis (H_0) when it is true (Fowler & Cohen, 1990).

clearly seen on the day zero and +1 for upgrade/downgrade/no change/no ratings. We can say here that stocks that are rated higher, earn higher returns, stocks that could maintain their previous ratings, get higher returns, even those who did not get any ratings this time get higher returns. All the above are observations but we cannot statistically prove them as all results are insignificant. Again, we can say here that we cannot reject the hypotheses formulated (*H4, H5, H6, H7*).

In the end, we can infer from the results of the study that the response of investors is in line with the price pressure hypothesis and we cannot comment on the downward sloping demand hypothesis, pending the requirement of a long period study. For both 2018 and 2019, results do give some sense of the presence of the information cost hypothesis as there seems to be a reduction of asymmetry problem in the stock market, although not proven statistically.

5. DISCUSSION

Our findings are in line with several previous studies where researchers could not establish a statistically significant relationship between sustainability and stock return (Kreander, Gray, Power, & Sinclair, 2005; Scholtens, 2005; Bauer, Koedijk, & Otten, 2004; Cheung, 2011). In fact, markets had penalized the inclusion of German corporations in the DJSI World and the DJSI Stoxx, (Orbendorfer et al., 2013; Hiroki & Okada, 2011; Aragón-Correa & Rubio-López, 2007; Link & Naveh, 2006) find no relationship between the DJSI group of companies and others.

We find evidence of positive and negative abnormal returns, but these results are not significant, and data analysis shows that non-financial factors such as sustainability are not taken into consideration by investors. Such results make us challenge the two dimensions of sustainability. One, it seems that shareholders have not been communicated the advantages of being sustainable, and two, sustainability is in a nascent stage in India because investors do not see environmental news as relevant news at all. This is further supported by the fact that even India's stock exchanges are lagging in the development of the sustainability index, with just three indexes to date, such as ESG, Greenex, and Carbonex.

The present study shows slight stock market reactions around rating announcement, so we can sparingly favor shareholder theory with the possibility of expecting different outcomes after shareholder awareness initiatives. We assume that the organization would not benefit from fully ignoring one at the detriment of another, and thus, management must take care of the interests of everyone by holding the company's stockholders' interests intact.

In addition, we may assume that investors are not willing to disregard ranking-related news, nor do they respond negatively, which may mean that they are oblivious to such issues as corporate environmental awareness or may not be environmentally conscious themselves. It will open up new research perspectives to examine investors' levels of environmental knowledge. We also conclude that the short term in different mindset of investors may also have long term consequences, as

this very fact challenges the trust put in such companies by the market, no matter how hard they try to achieve these rankings.

The outcomes of this research may be an eye-opener for businesses in terms of where they are going wrong, maybe they are unable to reach the stockholders. Although several studies have been carried out in developed countries, this is one of its kind study of emerging markets such as India, where the magnitude of the agency problem between managers and shareholders is high on the basis of poor compliance, corporate governance, and reaching the last man, the findings show that the last man is unaware of the company's such a significant strategic move.

This idea is expected to pick up in this new age of the COVID scenario, as we assume that investors will be attracted to businesses that imbibe sustainability as part of their culture over the next few years.

The ranking does not contain any information for the market, and that is why there is no reaction in the stock prices. These rankings when displayed in the company logo, catch the attention of customers, employees, and investors, customers feel we are consuming products of an ethical company, employees feel we are working for an ethical company and investors feel we are investing in an ethical company, that means an effort in this direction can give multiple gains to all segments. GreenCo can also make a statement citing reasons why companies were ranked, and why others were not ranked, this will further give a connection between being sustainable at the same time being rewarded on the monetary front.

Four major limitations could affect the findings of this research. One, the methodology used by rating agencies and parameters used in ranking the companies can result in different outcomes. These agencies assign different weights to the same parameter and at times change their previously deployed methodology altogether. In the current study, we have used ratings of only one agency, hence this problem does not arise. But in case we consider multiple ratings of various agencies and also over a longer period of time, then it would become difficult to reach a consensus and results might be ambiguous. The second limitation arises from the fact that rated companies are mostly big multinationals having multiple plants across the globe. Thus, this might become difficult to assess and replicate the positive or negative response to the socially responsible behavior of a plant and see its impact on the entire firm. The third limiting factor in this study comes from the use of a single parameter such as stock prices as a measure of value when there are numerous and differing performance measurements (Krajnc & Glavi, 2005; Lopez, Garcia, & Rodriguez, 2007). This fact limits the inclusion of other areas that can be value generating. In the end, we state that stock prices are impacted by a number of other factors, besides sustainability ranking announcements every minute. For example, several micro and macro announcements make or break new trends in the stock prices and sometimes it becomes practically impossible to segregate these impacts.

The scope of the current study is limited to trying to establish direct linkages between ranking

and its effect on shareholder wealth only and ignoring other stakeholders like consumers, employees, etc. The future scope of the study could be to see the impact of socially responsible behavior of firms on various stakeholder groups and we can also figure out the net social gain or loss by offsetting the gains accruing to one stakeholder and loss accruing to another. Besides GreenCo, we can also include the other ranking announcements of other rating agencies and may draw on the subject from a different viewpoint.

6. CONCLUSION

In India where issues of agency problems are so rampant in comparison to developed nations of the world, this study should add useful insights by addressing the interests of minority stakeholders in an organization. What companies and investors should foresee in the long term view is that companies moving on the path of sustainability will emerge as ultimate winners over those who are short-sighted. Stock markets in India are highly volatile, let us say, climate change or weather change infuses volatility in commodity markets, but those companies which have ESG already in place will hedge themselves on the backing of effective risk management. There is no doubt that the long term benefits of being sustainable exist, and the way corporates are showing interest in sustainability is commendable. The fact that now companies are participating in ESG ratings in large numbers, is a clear signal of this fact. There are several studies that have largely focused on whether stock market participants view ESG ratings in a positive light and price-in accordingly (Lo & Sheu, 2007) or is there a higher performance of sustainable companies *vis.a.vis* other companies (Konar & Cohen, 2001; Lopez et al., 2007; Becchetti, Di Giacomo, & Pinnacchio, 2008; Chih et al., 2010).

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APPENDIX

Table 2. Event study results of overall ratings received by all the companies (2017-2019)

	2017					2018					2019			
Period	*Total AR of 26 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*	*Period*	*Total AR of 13 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*	*Period*	*Total AR of 15 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*
-10	0.075	0.003	0.0008	0.0495	-10	-0.007	0.0018	0.0143	0.4118	-10	0.1256	0.0084	0.0193	0.886
-9	-0.063	-0.003	-0.007	-0.469	-9	-0.004	-0.004	0.0138	0.4149	-9	0.0506	0.0034	0.0158	0.7588
-8	-0.055	-0.002	-0.01	-0.706	-8	-0.011	-0.002	0.012	0.3804	-8	0.0695	0.0046	0.0074	0.3747
-7	-0.068	-0.003	-0.007	-0.56	-7	0.1023	0.0131	0.016	0.539	-7	-0.02	-0.001	0.004	0.2157
-6	0.0542	0.0022	-0.005	-0.422	-6	-0.104	-2E-04	0.0175	0.6308	-6	0.0565	0.0038	-6E-04	-0.036
-5	0.1038	0.0042	-0.003	-0.222	-5	-0.09	-0.018	0.0044	0.1725	-5	0.0241	0.0016	0.0007	0.0454
-4	-0.116	-0.005	-0.005	-0.448	-4	0.0116	0.0173	0.0046	0.1972	-4	-0.041	-0.003	-0.003	-0.207
-3	0.1893	0.0076	-0.009	-0.94	-3	-0.052	-0.007	0.0222	1.0595	-3	-0.011	-7E-04	-0.005	-0.353
-2	0.0004	1.56E-05	-0.004	-0.519	-2	-0.059	0.0001	0.0049	0.2707	-2	-0.005	-3E-04	-0.002	-0.169
-1	-0.296	-0.012	-0.012	-1.769	-1	0.019	0.0117	0.0118	0.7989	-1	-0.013	-9E-04	-0.001	-0.129
0	-0.172	-0.007	-0.007		0	-0.119	-0.031	-0.01		0	-0.019	-0.001	-0.001	
1	-0.135	-0.005	0.0008	0.1187	1	-0.094	-0.02	-0.02	-1.367	1	-0.006	-4E-04	0.0078	0.8449
2	0.1553	0.0062	0.0022	0.272	2	0.1165	-1.29E-05	-0.014	-0.793	2	0.1242	0.0083	0.003	0.2631
3	0.0358	0.0014	0.0029	0.3068	3	0.0187	0.0059	-0.009	-0.448	3	-0.073	-0.005	0.0089	0.675
4	0.0168	0.0007	0.0033	0.3137	4	0.0285	0.005	-0.022	-0.951	4	0.0881	0.0059	0.0175	1.1912
5	0.0104	0.0004	-0.002	-0.175	5	-0.044	-0.013	-5E-04	-0.019	5	0.1294	0.0086	0.0131	0.8144
6	-0.133	-0.005	0.0038	0.3071	6	0.0668	0.0218	0.012	0.433	6	-0.066	-0.004	0.0113	0.652
7	0.1466	0.0059	0.0043	0.3214	7	0.0831	0.0125	0.0114	0.3831	7	-0.027	-0.002	0.0102	0.5509
8	0.0114	0.0005	0.0055	0.3864	8	0.0789	-7E-04	0.0074	0.2351	8	-0.016	-0.001	0.0036	0.185
9	0.0295	0.0012	0.0017	0.1134	9	0.0463	-0.004	0.0013	0.0406	9	-0.099	-0.007	0.0099	0.4782
10	-0.095	-0.004	0.0017	0.1082	10	-0.14	-0.006	0.0013	0.0387	10	0.0943	0.0063	0.0099	0.456
		(-2, +2)	-0.018	-1.695			(-2,+2)	-0.039	-1.682			(-2,+2)	0.0054	0.3657
		(-5, +5)	-0.008	-0.529			(-5, +5)	-0.049	-1.4			(-5, +5)	0.0132	0.6052
		(-10, +10)	-0.012	-0.563			(-10, +10)	-0.016	-0.331			(-10, +10)	0.0244	0.8112

Table 3. Event study results of positive abnormal returns/cumulative abnormal returns around day 0 (2017-2019)

		2017					2018					2019		
Period	Total AR of 6 companies	Average AR	CAAR	t-statistics	Period	Total AR of 3 companies	Average AR	CAAR	t-statistics of CAAR	Period	Total AR of 8 companies	Average AR	CAAR	t-statistics of CAAR
-11	0.079	0.0132	0.02	0.75067	-11	0.11767	0.03922	0.03791	0.75696	-11	0.0344	0.0043	-0.00043	-0.01538
-10	-0.015	-0.002	0.02	0.9196	-10	-0.01728	-0.00576	0.02539	0.52966	-10	0.06564	0.0082	0.01127	0.41726
-9	-0.009	-0.001	0.01	0.28907	-9	0.01914	0.00638	-0.01383	-0.30246	-9	0.02568	0.00321	0.00697	0.2707
-8	-0.01	-0.002	0.01	0.43805	-8	0.0407	0.01357	-0.00807	-0.18598	-8	0.04421	0.00553	-0.00123	-0.05041
-7	0.022	0.0037	0.01	0.54833	-7	0.03855	0.01285	-0.01444	-0.35326	-7	-0.06869	-0.00859	-0.00444	-0.19279
-6	0.019	0.0032	0.01	0.69301	-6	-0.07232	-0.02411	-0.02801	-0.73233	-6	0.01733	0.00217	-0.00997	-0.46253
-5	0.04	0.0066	0.01	0.50561	-5	-0.0076	-0.00253	-0.04086	-1.15389	-5	0.05335	0.00667	-0.00138	-0.06929
-4	-0.02	-0.003	0	0.32276	-4	-0.01322	-0.00441	-0.01675	-0.51828	-4	-0.04118	-0.00515	-0.00355	-0.19486
-3	-0.005	-9E-04	-0	-0.17237	-3	-0.00752	-0.00251	-0.01422	-0.49179	-3	-0.04024	-0.00503	-0.01022	-0.62719
-2	0.06	0.01	0	0.1155	-2	-0.00535	-0.00178	-0.00981	-0.39186	-2	0.01821	0.00228	-0.00507	-0.35937
-1	-0.047	-0.008	0	0.24144	-1	-0.01656	-0.00552	-0.0073	-0.35727	-1	-0.01853	-0.00232	-4.02E-05	-0.00349
0	0.013	0.0022	-0		0	0.03374	0.01125	-0.00994		0	0.09783	0.01223	-0.00128	
1	-0.032	-0.005	-0	-0.50668	1	-0.038	-0.01267	0.0289	1.4135	1	-0.03209	-0.00401	0.0005	0.04318
2	0.005	0.0009	-0	-0.31009	2	0.1247	0.04157	0.03593	1.43501	2	0.03607	0.00451	-0.00281	-0.19895
3	0.007	0.0011	-0	-0.17829	3	0.0211	0.00703	0.03756	1.29925	3	-0.02643	-0.0033	0.00017	0.01016
4	0.007	0.0011	-0	-0.57159	4	0.0049	0.00163	0.04206	1.30125	4	0.02378	0.00297	0.00181	0.09922
5	-0.034	-0.006	-0	-1.123	5	0.0135	0.0045	0.0266	0.75127	5	0.01313	0.00164	-6.35E-05	-0.00318
6	-0.055	-0.009	-0	-0.88979	6	-0.04638	-0.01546	0.01917	0.50112	6	-0.01497	-0.00187	-0.00297	-0.13774
7	0.015	0.0025	-0	-0.81877	7	-0.02231	-0.00744	0.03129	0.76526	7	-0.02324	-0.00291	-0.00118	-0.05128
8	0.001	0.0002	-0	-0.8246	8	0.03637	0.01212	0.05133	1.18357	8	0.0143	0.00179	-0.0072	-0.29478
9	-0.006	-1E-03	-0	-0.76786	9	0.06012	0.02004	0.03395	0.74276	9	-0.04818	-0.00602	0.00475	0.18441
10	0.002	0.0003	-0	-0.73213	10	-0.05212	-0.01737	0.03395	0.7082	10	0.09563	0.01195	0.00475	0.17583
		(-2,+2)	-0	-0.01041			(-2,+2)	0.03284	1.016			(-2,+2)	0.01269	0.69652
		(-5, +5)	-0	-0.06168			(-5, +5)	0.03656	0.76248			(-5, +5)	0.01049	0.38819
		(-10, +10)	-0	-0.25362			(-10, +10)	0.03138	0.47363			(-10, +10)	0.02395	0.64167

Table 4. Event study results of negative abnormal returns/cumulative abnormal returns around day 0 (2017-2019)

	2017					2018					2019			
Period	*Total AR of 20 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*	*Period*	*Total AR of 10 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*	*Period*	*Total AR of 7 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*
-11	0.08509	0.00448	-0.0009	-0.0479	-11	0.01378	0.00153	-0.0029	-0.1035	-11	0.0187	0.00267	0.01735	0.71934
-10	0.09103	0.00479	-0.001	-0.0557	-10	0.00991	0.0011	-0.0155	-0.571	-10	0.05995	0.00856	0.02846	1.23234
-9	-0.0225	-0.0012	-0.0054	-0.3312	-9	-0.0234	-0.0026	-0.017	-0.658	-9	0.02492	0.00356	0.02579	1.17117
-8	-0.0533	-0.0028	-0.0102	-0.6567	-8	-0.0517	-0.0057	-0.0181	-0.7385	-8	0.02531	0.00362	0.01722	0.82448
-7	-0.0681	-0.0036	-0.009	-0.6159	-7	0.06376	0.00708	-0.0155	-0.671	-7	0.0483	0.0069	0.01366	0.6937
-6	0.04239	0.00223	-0.0062	-0.4543	-6	-0.0313	-0.0035	-0.0098	-0.4519	-6	0.03912	0.00559	0.01004	0.5453
-5	0.06778	0.00357	-0.0027	-0.2087	-5	-0.0826	-0.0092	-0.0169	-0.8415	-5	-0.0293	-0.0042	0.00315	0.18444
-4	-0.1166	-0.0061	-0.0049	-0.4208	-4	0.02485	0.00276	-0.0134	-0.732	-4	0.00037	5.30E-05	-0.0024	-0.157
-3	0.16036	0.00844	-0.0085	-0.814	-3	-0.0446	-0.005	-0.0042	-0.2579	-3	0.02947	0.00421	0.00174	0.12462
-2	0.02669	0.0014	-0.0023	-0.2577	-2	-0.0539	-0.006	-0.007	-0.4926	-2	-0.023	-0.0033	0.00168	0.1395
-1	-0.2311	-0.0122	-0.0108	-1.4649	-1	0.03559	0.00395	-0.002	-0.1753	-1	0.00526	0.00075	-0.0025	-0.2567
0	-0.1576	-0.0083	-0.0069		0	-0.153	-0.017	-0.0099		0	-0.117	-0.0167	-0.0013	
1	-0.1176	-0.0062	0.00082	0.11116	1	-0.056	-0.0062	-0.0071	-0.6166	1	0.02559	0.00366	0.01624	1.64947
2	0.13313	0.00701	0.00248	0.27543	2	-0.0082	-0.0009	-0.0074	-0.522	2	0.0881	0.01259	0.00962	0.79768
3	0.03155	0.00166	0.00283	0.27242	3	-0.0024	-0.0003	-0.0048	-0.2916	3	-0.0464	-0.0066	0.0188	1.3502
4	0.00669	0.00035	0.00574	0.49441	4	0.02364	0.00263	-0.0112	-0.6094	4	0.06427	0.00918	0.0354	2.27411
5	0.05532	0.00291	-0.0002	-0.0154	5	-0.0574	-0.0064	0.00142	0.07094	5	0.11622	0.0166	0.02814	1.64982
6	-0.1128	-0.0059	0.0056	0.4075	6	0.11316	0.01257	0.01314	0.60683	6	-0.0509	-0.0073	0.02766	1.50161
7	0.11009	0.00579	0.0027	0.18372	7	0.10545	0.01172	0.01786	0.7717	7	-0.0033	-0.0005	0.02327	1.18169
8	-0.0551	-0.0029	0.00511	0.32793	8	0.04251	0.00472	0.01632	0.66483	8	-0.0307	-0.0044	0.01604	0.76795
9	0.04579	0.00241	0.00087	0.05312	9	-0.0139	-0.0015	0.00659	0.25452	9	-0.0506	-0.0072	0.01585	0.71968
10	-0.0805	-0.0042	0.00087	0.05064	10	-0.0876	-0.0097	0.00659	0.24268	10	-0.0014	-0.0002	0.01585	0.68619
		(-2,+2)	-0.0182	-1.5705			(-2,+2)	-0.0262	-1.4299			(-2,+2)	-0.003	-0.1925
		(-5, +5)	-0.0074	-0.432			(-5, +5)	-0.0415	-1.5307			(-5, +5)	0.01625	0.70371
		(-10, +10)	-0.0129	-0.5405			(-10, +10)	-0.0274	-0.7318			(-10, +10)	0.02492	0.78106

Table 5. Event study results for upgrade/downgrade/no change/no rating for 2018, taking 2017 as reference year

	Upgrade					Downgrade					No change					No rating			
Period	*Total AR of 7 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*	*Period*	*Total AR of 6 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*	*Period*	*Total AR of 3 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*	*Period*	*Total AR of 17 companies*	*Average AR*	*CAAR*	*t-statistics of CAAR*
-11	0.12	0.02	-0	-0.1	-11	-0	-0	0.01	0.28	-11	0	0	0.02	0.46	-11	0.13	0	0.02	0.46
-10	-2.76E-05	-3.94E-06	-0	-0.3	-10	0	0	-0	-0.4	-10	0.01	0	0.01	0.41	-10	-0	0	0.01	0.41
-9	0.01	0	-0	-0.9	-9	-0	-0	-0	-0.4	-9	-0	-0	0.01	0.41	-9	-0	-0	0.01	0.41
-8	0.02	0	-0	-1	-8	-0	-0	-0	-0.4	-8	-0	-0	0.01	0.38	-8	-0	-0	0.01	0.38
-7	0.06	0.01	-0	-1.1	-7	0.09	0.02	-0	-0.3	-7	0.04	0.01	0.02	0.54	-7	0.1	0.01	0.02	0.54
-6	-0.1	-0	-0	-1.3	-6	-0.1	-0	-0	-0	-6	-0	-0	0.02	0.63	-6	-0.1	-0	0.02	0.63
-5	-0	-0	-0	-1.8	-5	-0	-0	-0	-0.7	-5	-0.1	-0	0	0.17	-5	-0.1	-0	0	0.17
-4	-0	-0	-0	-1.5	-4	0.04	0.01	-0	-0.3	-4	0.05	0.02	0	0.2	-4	0.01	0.02	0	0.2
-3	-0	-0	-0	-1.3	-3	-0	-0	0	0.05	-3	-0	-0	0.02	1.06	-3	-0.1	-0	0.02	1.06
-2	-0.1	-0	-0	-1.2	-2	-0	-0	-0	-0.3	-2	0	0	0	0.27	-2	-0.1	0	0	0.27
-1	-0	-0	-0	-1.3	-1	0.03	0.01	0	0.01	-1	0.04	0.01	0.01	0.8	-1	0.02	0.01	0.01	0.8
0	-0	-0	-0		0	-0.1	-0	-0		0	-0.1	-0	-0		0	-0.1	-0	-0	
1	-0	-0	0.01	0.53	1	-0.1	-0	-0	-0.1	1	-0.1	-0	-0	-1.4	1	-0.1	-0	-0	-1.4
2	0.08	0.01	0.01	0.53	2	0.05	0.01	-0	-0.5	2	-3.87E-05	-1.29E-05	-0	-0.8	2	0.12	-1.29E-05	-0	-0.8
3	0.01	0	0.01	0.67	3	-0	-0	-0	-0.3	3	0.02	0.01	-0	-0.4	3	0.02	0.01	-0	-0.4
4	0.03	0	0.02	0.74	4	0.01	0	-0	-0.7	4	0.02	0.01	-0	-1	4	0.03	0.01	-0	-1
5	0.02	0	0.02	0.71	5	-0.1	-0	-0	-0.3	5	-0	-0	-0	-0	5	-0	-0	-0	-0
6	0.01	0	0.03	1.09	6	0.04	0.01	0	0.02	6	0.07	0.02	0.01	0.43	6	0.07	0.02	0.01	0.43
7	0.07	0.01	0.04	1.44	7	0.05	0.01	0.01	0.19	7	0.04	0.01	0.01	0.38	7	0.08	0.01	0.01	0.38
8	0.08	0.01	0.05	1.73	8	0.03	0	0	0.06	8	-0	-0	0.01	0.24	8	0.08	-0	0.01	0.24
9	0.07	0.01	0.04	1.24	9	-0	-0	-0	-0.3	9	-0	-0	0	0.04	9	0.05	-0	0	0.04
10	-0.1	-0	0.04	1.18	10	-0.1	-0	-0	-0.3	10	-0	-0	0	0.04	10	-0.1	-0	0	0.04
		(-2,+2)	-0	-0.6			(-2,+2)	-0	-1.1			(-2,+2)	-0	-1.7			(-2,+2)	-0	-1.7
		(-5, +5)	-0	-0.6			(-5, +5)	-0	-1.4			(-5, +5)	-0	-1.4			(-5, +5)	-0	-1.4
		(-10, +10)	0.01	0.16			(-10, +10)	-0	-1			(-10, +10)	-0	-0.3			(-10, +10)	-0	-0.3

Table 6. Event study results for upgrade/downgrade/no change/no rating for 2019, taking 2018 as reference year

	Upgrade					Downgrade					No change					No rating			
Period	Total AR of 14 companies	Average AR	CAAR	t-statistics of CAAR	Period	Total AR of 1 company	Average AR	CAAR	t-statistics of CAAR	Period	Total AR of 4 companies	Average AR	CAAR	t-statistics of CAAR	Period	Total AR of 6 companies	Average AR	CAAR	t-statistics of CAAR
-11	0.05	0	0	0.16	-11	0.02	0.02	0.01	0.3	-11	0.03	0.01	0.02	0.7	-11	0.05	0	0.01	0.35
-10	0.1	0.01	0.01	0.66	-10	0.01	0.01	0.04	0.82	-10	0.03	0.01	0.04	1.29	-10	0.13	0.01	0.02	0.89
-9	0.05	0	0.01	0.54	-9	0.01	0.01	0.02	0.47	-9	0.03	0.01	0.03	1.06	-9	0.05	0	0.02	0.76
-8	0.03	0	0	0.2	-8	0	0	0.01	0.34	-8	0.03	0.01	0.02	0.86	-8	0.07	0	0.01	0.37
-7	-0	-0	0	0.02	-7	0.02	0.02	0.01	0.18	-7	0.02	0.01	0.02	0.6	-7	-0	-0	0	0.22
-6	0.05	0	-0	-0.1	-6	-0	-0	0	0.13	-6	0.03	0.01	0.01	0.31	-6	0.06	0	-0	-0
-5	0.02	0	-0	-0	-5	-0	-0	-0	-0.3	-5	-0	-0	0	0.09	-5	0.02	0	0	0.05
-4	-0	-0	-0	-0.3	-4	-0	-0	-0	-0.3	-4	0	0	-0	-0.2	-4	-0	-0	-0	-0.2
-3	-0	-0	-0	-0.4	-3	0	0	-0	-0.1	-3	-0	-0	-0	-0.2	-3	-0	-0	-0	-0.4
-2	-0	-0	-0	-0.2	-2	-0	-0	0	0.15	-2	-0	-0	-0	-0.3	-2	-0	-0	-0	-0.2
-1	-0	-0	-0	-0.2	-1	0.01	0.01	-0	-0	-1	0	0	-0	-0.3	-1	-0	-0	-0	-0.1
0	-0	-0	-0		0	-0	-0	-0		0	-0	-0	-0		0	-0	-0	-0	
1	0.01	0	0.01	1.02	1	-0	-0	0.03	1.45	1	-0	-0	0.01	1.04	1	-0	-0	0.01	0.84
2	0.12	0.01	0	0.33	2	0.04	0.04	0.02	0.93	2	0.06	0.02	0.01	0.69	2	0.12	0.01	0	0.26
3	-0.1	-0	0.01	0.67	3	-0	-0	0.02	0.86	3	-0	-0	0.03	1.59	3	-0.1	-0	0.01	0.67
4	0.07	0.01	0.02	1.2	4	0	0	0.04	1.38	4	0.07	0.02	0.04	2.16	4	0.09	0.01	0.02	1.19
5	0.12	0.01	0.01	0.77	5	0.02	0.02	0.05	1.48	5	0.06	0.01	0.04	1.9	5	0.13	0.01	0.01	0.81
6	-0.1	-0	0.01	0.61	6	0.01	0.01	0.06	1.52	6	-0	-0	0.04	1.56	6	-0.1	-0	0.01	0.65
7	-0	-0	0.01	0.5	7	0.01	0.01	0.04	1.09	7	-0	-0	0.04	1.37	7	-0	-0	0.01	0.55
8	-0	-0	0	0.17	8	-0	-0	0.03	0.83	8	-0	-0	0.03	0.97	8	-0	-0	0	0.19
9	-0.1	-0	0.01	0.49	9	-0	-0	0.04	0.81	9	-0	-0	0.02	0.79	9	-0.1	-0	0.01	0.48
10	0.09	0.01	0.01	0.47	10	0	0	0.04	0.77	10	-0	-0	0.02	0.75	10	0.09	0.01	0.01	0.46
		(-2,+2)	0.01	0.43			(-2,+2)	0.02	0.65			(-2,+2)	-0	-0.1			(-2,+2)	0.01	0.37
		(-5, +5)	0.01	0.56			(-5, +5)	0.03	0.56			(-5, +5)	0.03	0.94			(-5, +5)	0.01	0.61
		(-10, +10)	0.02	0.65			(-10, +10)	0.05	0.76			(-10, +10)	0.04	1.01			(-10, +10)	0.02	0.81