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When Green Mission Meets ESG Ratings: An Event Study of Tesla's Market Reaction

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Abstract:

As global investment preferences shift toward environmental and sustainability factors, ESG ratings are becoming an increasingly important factor in investment decisions. Many existing studies have confirmed the correlation between ESG ratings and corporate financial performance, but in-depth discussion on the "paradox" of companies such as Tesla, which make outstanding contributions in core environmental protection areas but perform poorly in overall ESG ratings, is limited. This paper takes the event of Tesla being removed from the S&P 500 ESG Index on May 18, 2022, as the research object, and adopts the event study method to analyze the stock price changes in the event window period ([-5, +5] trading days) and the later period (30 trading days after the event). Results indicate that there is no significant abnormal return before the event date, suggesting that the information was not leaked in advance, while after the event, the largest negative abnormal return occurs on the second trading day after the event, reflecting the rapid market reaction to ESG information and the negative impact of the event on firm valuation. This study supports the view that ESG information is value-relevant and provides an empirical basis for incorporating ESG factors into investment decisions.

Keywords: ESG Ratings, Event Study, Data Analysis, Tesla

1. Introduction

According to the 2025 report from Fortune Business Insights, the global ESG investment market reached $33.64 trillion in 2024 and is expected to reach $125.17 trillion by 2032. Meanwhile, global ESG assets have surpassed $40 trillion in 2024, accounting for more than one-third of total global assets under management (Fortune Business Insights, 2025). Applying ESG principles to the investment market has become a mainstream trend.

However, despite the significant correlation between ESG ratings and investment performance having been tested, the assessment methods and practical implications remain controversial. On May 18, 2022, S&P Dow Jones Indices announced that Tesla was removed from the 500 ESG Index. This decision

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not only attracted widespread attention from the capital market but also drew public criticism from Elon Musk, the company's CEO. Once again, ESG ratings and transparency become the Focus of public opinion (Wall Street CN, 2022). As a company primarily focused on promoting electric transport and environmental sustainability, Tesla has been excluded from the ESG index due to its not-so-good sustainability performance, creating a paradox that makes it a representative case in general studies on the relationship between ESG ratings and stock prices so far.

Against this background, this study targets Tesla. It focuses mainly on the special scenario in which the company, despite its notable sustainable mission, has faced ESG index controversy for several years. This research examines how the ESG index and related media affect a corporation's market value by analyzing stock price fluctuations during the event window ([-5, +5] trading days) and the post-event period (30 trading days after the event). Hopefully, this research will yield empirical evidence of the real impact of ESG ratings in specific industrial and corporate contexts, deepening our understanding of the complex relationship between ESG ratings and market responses.

2. Literature Review

The theoretical roots of environmental, social and governance (ESG) investing are deeply rooted in several management and sociological theories. Stakeholder theory constitutes its most central cornerstone. This theory was introduced by Freeman (1984) in his seminal book *Strategic Management: It is systematically proposed in A Stakeholder Approach*, which challenges the traditional principle of "shareholder first"(Freeman, 1984), and advocates that corporate managers must balance and respond to the demands and interests of all stakeholders (including employees, customers, communities, environment, etc.) instead of only being responsible to shareholders (Jones, 1995). On this basis, organizational legitimacy theory provides key theoretical support for ESG practice. Suchman's (1995) classic document *Managing Legitimacy: Strategic and Institutional Approaches* makes a systematic integration and theoretical promotion of organizational legitimacy research, defining legitimacy as "the general cognition or assumption of entity behavior in a socially constructed system of norms, values, beliefs and definitions. Consider it desirable, legitimate or appropriate ", and further discuss the strategies that organizations can take in the process of obtaining, maintaining and repairing legitimacy (Suchman, 1995). Furthermore, the resource-based view of nature links environmental sustainability with corporate competitive advantage. based on the natural-resource-based view (NRBV) of the fir, Stuart L. Hart and Glen Dowell explored how enterprises can build sustainable competitive advantage through environmental strategy (Hart & Dowell, 2011).

Many empirical studies have provided support for the correlation between ESG and corporate financial performance. Friede, Busch, and Bassen (2015) found that ESG investing has a solid empirical foundation through a systematic and integrated analysis of more than 2,200 empirical studies (covering a total of about 3,700 research findings): About 90% of the studies show a non-negative relationship between ESG and corporate financial performance, and most of these findings are positive and significant. In addition, the study further points out that the positive impact of ESG on financial performance shows a high degree of stability across time periods (Friede et al., 2015). In terms of ESG information disclosure, Mozaffar Khan et al. (2016) have confirmed that the materiality guidance by industry formulated by SASB has significantly helped ESG information disclosure (Khan et al., 2016). That partly backs up comments by Margaret Dorn, director of the 500 ESG Index at S&P Dow Jones Indices, in response to tesla that "you can't take a company's mission statement at face value, you should look at its actual actions across a number of key dimensions."

In addition, as an external monitoring mechanism, ESG-related news of media reports will also trigger substantial market reactions. Capelle-Blancard and Petit (2019) analyzed the impact of some 33,000 ESG-related news stories on hundreds of companies between 2002 and 2010, It is found that negative ESG news usually causes the corresponding company's market value to experience a low but significant drop, but positive news has no significant impact (Capelle-Blancard & Petit, 2019). Lucia Alessia,b,∗, Elisa Ossolaa and Roberto Panzica(2021) constructed the "greenness and transparency factor" based on European individual stock returns, To verify whether it is priced as a risk factor by the market and measure the relevant green premium, what is priced by the market is the combination of environmental performance and environmental transparency(Alessi et al., 2021).

While existing research has extensively explored various aspects of ESG, few scholars have examined the paradox of a company such as Tesla, where a company with strong material contributions in core environmental areas, such as EV promotion, underperforms in its overall ESG rating. This difference is particularly worth exploring given the current methodological controversy over Tesla's market importance. Tesla's case may reflect a different view of the "big" ESG factors among auto and new energy companies. This article mainly focuses on whether ESG rating factors and related negative news have a significantly different impact on Tesla's market value from the general rule.

3. Research Methodology

This study adopts the event study method to examine the impact of Tesla's ESG rating change and its exclusion from the S&P 500 ESG index on its market value. The research is designed to use the R language as a whole and primarily includes the following two parts: exploratory analysis and statistical inference.

3.1 Data collection and processing

The daily closing prices and trading volumes of Tesla (TSLA) and the S&P 500 index (SPY) were obtained from Yahoo Finance, and the research period was set. The estimation period for estimating the normal return model is set from November 2021 to April 2022 (120 trading days prior to the event); The event window is set to [-5, +5] trading days around May 18, 2022 (ESG elimination event), for a total of 11 days; The ex-post observation period for observing the persistence of the market reaction is set to 30 trading days after the event.

3.2 Descriptive statistical analysis

To gain a preliminary understanding of the market reaction, we analyze the price trends and trading volume trends, and the return distributions of TESLA and SPY within the event window.

3.2.1 Price trend visualization

Draw the normalized price trend chart of TSLA and SPY in the event window period, and mark the event day to visually compare the trend difference between the two.

3.2.2 Abnormal analysis of trading volume

Compare the average daily trading volume between the event window and the estimation period to identify any abnormal trading activity and determine whether market attention has increased due to the ESG event.

3.2.3 Yield distribution analysis

Use box plots to compare the distribution characteristics of returns in the event window and normal period to preliminarily test whether the volatility of returns has changed.

3.3 Statistical inference

To quantify the significant impact of ESG events on stock prices, we conduct a t-test for statistical inference.

3.3.1 Expected rate of return estimation

Using the market model, the α and β coefficients of TSLA relative to SPY are obtained by regression of estimated period data:

$$E(R_t) = \alpha + \beta \bullet R_{m,t}$$

3.3.2 Calculation of abnormal return rate

During the event window, daily abnormal returns are defined as follows.

$$AR_t = R_t - E(R_t)$$

Additionally, the cumulative abnormal return is calculated as described below.

$$CAR = \sum_{t=-5}^{+5} AR_t$$

3.3.3 Statistical significance test

A one-sample t-test was used to test whether CAR was significantly different from zero. The null hypothesis is that "ESG elimination events do not generate abnormal returns". If CAR is significantly negative, it supports the conclusion that ESG rating downgrades negatively affect stock prices.

We set the null hypothesis and alternative hypothesis as follows.

$$H_0 : CAR = 0 \text{ } H_1 : CAR \neq 0$$

3.4 Robustness test design

Three event Windows of different lengths [-4, +4], [-5, +5], and [-6, +6] were tested to verify the sensitivity of the results to window selection.

4. Empirical Results

4.1 Descriptive statistics and preliminary analysis

Figure 1 presents the long-term standardized price action of Tesla versus the S&P 500 index over the period January 2021 to January 2024, while Figure 2 focuses on the short-term price dynamics over the event window of [-5, +5] days.

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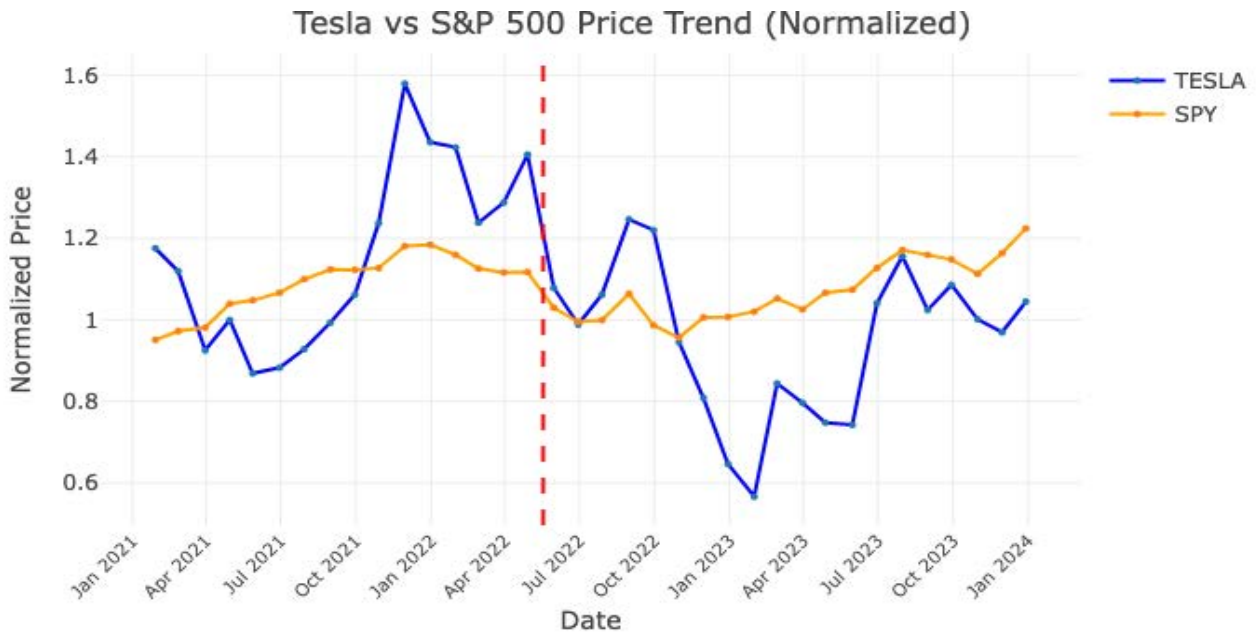

Figure 1 Tesla vs S&P 500 Price Trend (Long-term)

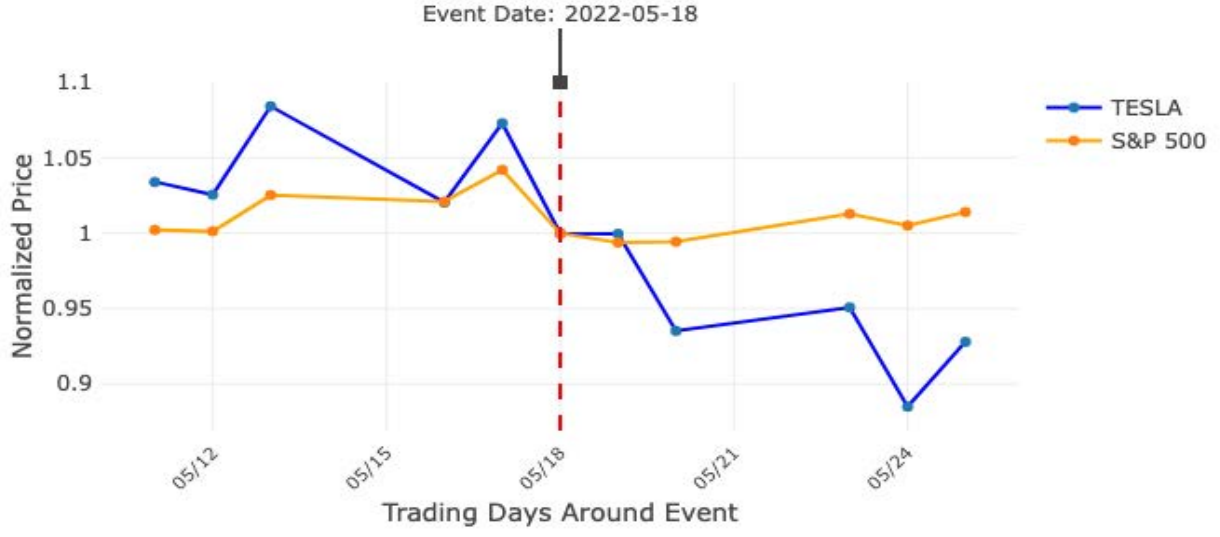

Figure 2 Tesla vs S&P 500 Price Trend (Event Window)

The long-term trend shows that Tesla's stock price exhibits significantly higher volatility than the market benchmark over the observation period, a feature consistent with its status as a high-growth technology stock.

The key finding appears in the analysis of the event window period. The price movements of Tesla and the S&P 500 index in the pre-event period (-5 to -1 days) are highly synchronized, and both exhibit a smooth sideways pattern. This parallel trend in the early stage provides an ideal basic condition for subsequent event-effect analysis, effectively excluding the possibility of price changes driven by information leakage in advance or by market expectations. On the day of the event (day 0), a clear starting point for price divergence was observed, and Tesla's stock price began to weaken relative to the market benchmark. Later in the event period (+1 to +5 days), price divergence increased further, with Tesla's standardized price falling from the pre-event level of close to 1.0 to below 0.95, while the S&P 500 index remained relatively stable. This relative value loss of about 5 percent is statistically and economically significant."

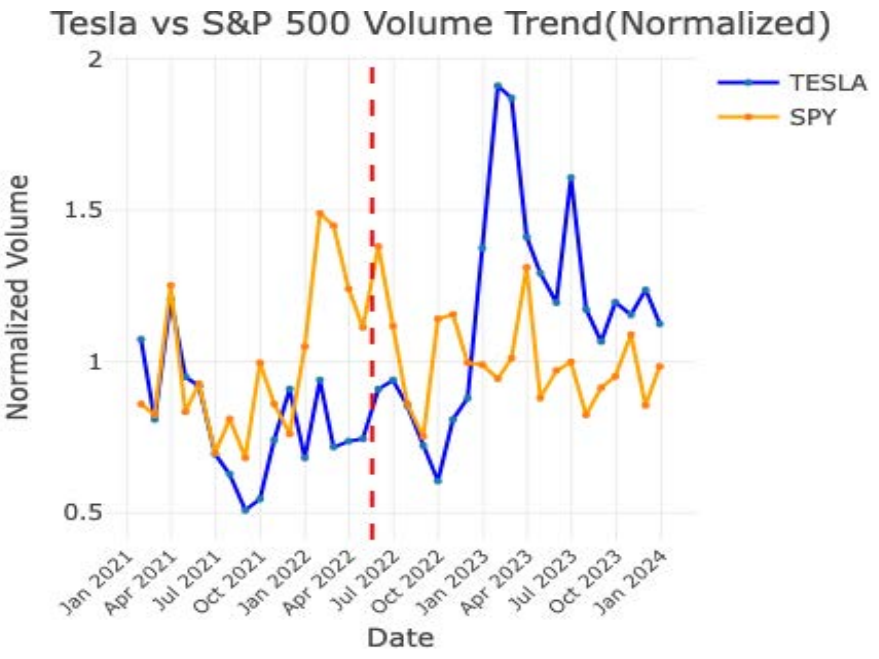

Figure 3 Tesla vs S&P 500 Volume Trend (Long-term)

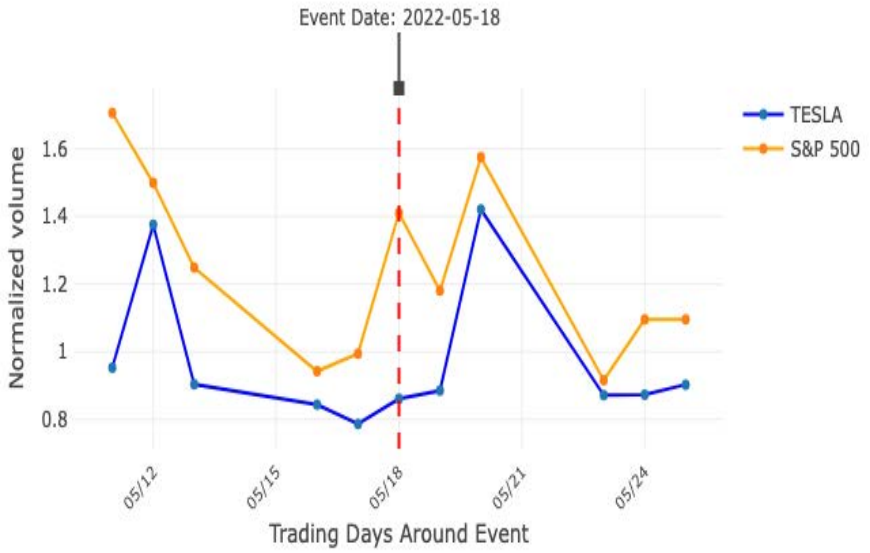

Figure 4 Tesla vs S&P 500 Volume Trend (Event Window)

Trading volume analysis shows that there is no significant abnormal fluctuation of Tesla trading volume compared with the market on the event day and the event window, as shown in Figure 3 and Figure 4.

Throughout the event window, the trading volume ratio of the two targets remained in a stable range, further confirming the lack of structural change. This finding suggests that ESG rating adjustment events did not trigger Tesla-specific changes in trading behavior. Investors may react to this information through channels other than adjustments in trading activity

The comparison of return distribution is presented by boxplots, as shown in Figure 5 and Figure 6. The volatility of returns during the event window is significantly higher than in the normal period, and the distribution shape changes, suggesting that the event affects the price discovery process.

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Figure 5 Tesla vs S&P 500 Return Distribution (Long-term)

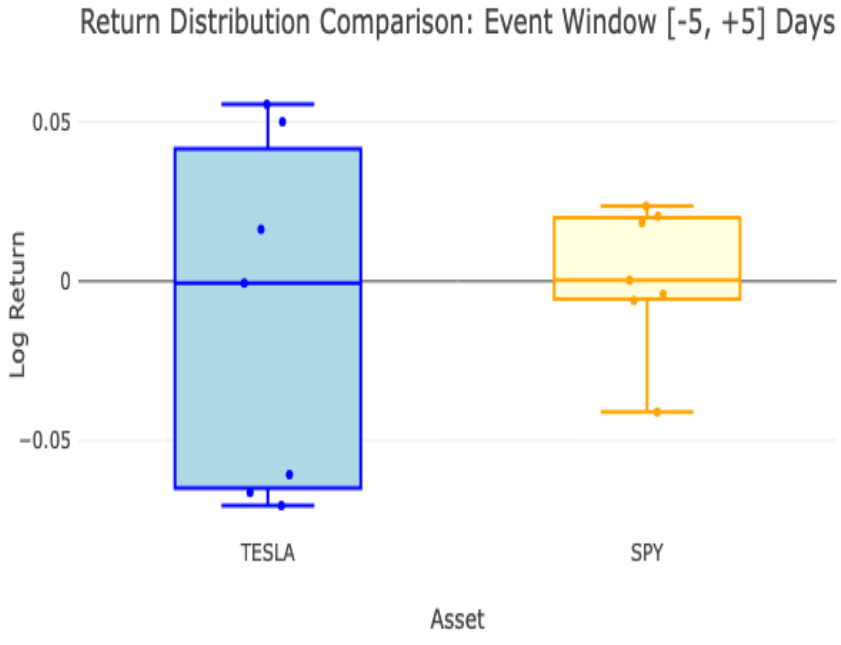

Figure 6 Tesla vs S&P 500 Return Distribution (Event Window)

4.2 Main empirical results

Based on the event study method, the expected rate of return market model is established as shown in Table 1, and the statistical inference results are shown in Table 2. During the event window of [-5, +5], the mean of Tesla's cumulative abnormal return (CAR) is nearly -3.58%, which is statistically significant. This result indicates that ESG exclusion events have a significant negative impact on Tesla's stock price.

Table 1 Market Model Parameters

α	β	R
-0.000914	1.931992	0.4688

Table 2 Statistical Test Results

CAR Mean	t-statistic	p-value
-0.03582593	-2.61546	0.03982781

The dynamic analysis of abnormal returns is shown in Figure 7, and the largest negative abnormal return occurs on the second trading day after the event, indicating that the market reacts relatively quickly to ESG information. The abnormal return prior to the event date is not significant, indicating no obvious information leakage.

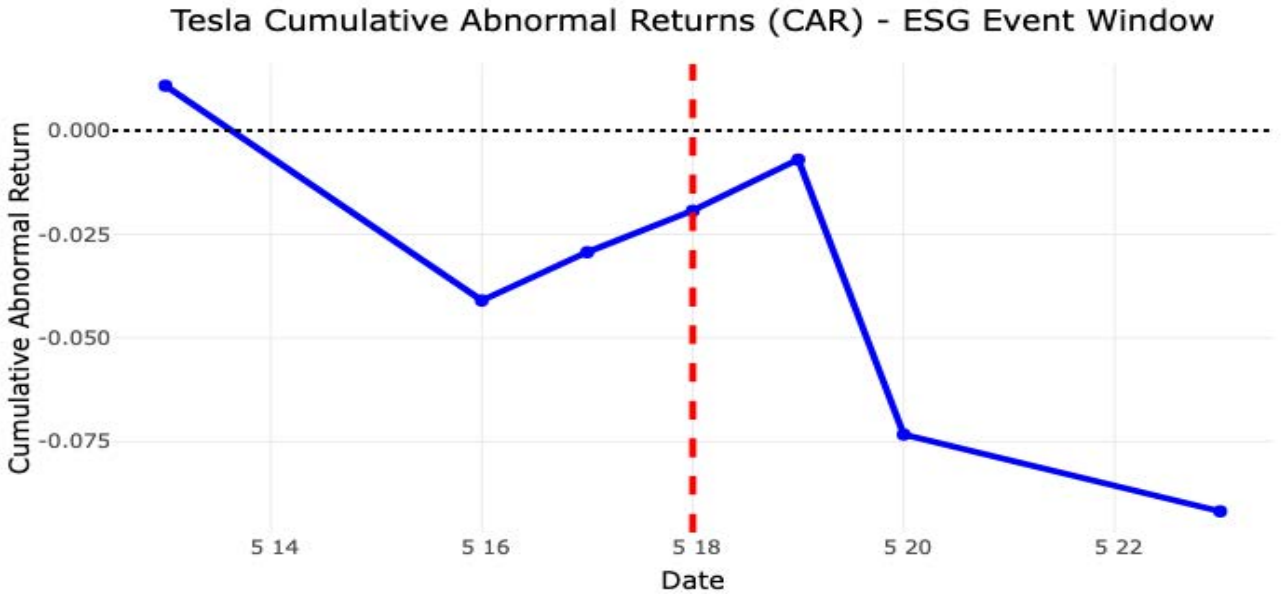

Figure 7 Tesla CAR (Event Window)

4.3 Robustness test results

Sensitivity analyses confirm the robustness of the main conclusions. Under different event window Settings, the cumulative abnormal returns remain statistically significant:

[-4, +4] window: CAR = -4.4793%
[-5, +5] Window: CAR = -3.5826%
[-6, +6] Window: CAR = -4.9565%

The consistency of the results across window lengths suggests that the conclusions are not sensitive to the choice of the event window, enhancing the credibility of the findings.

4.4 Discussion and Limitation

The empirical results show that ESG rating changes have a significantly negative impact on Tesla's stock price, which supports the theoretical expectation that ESG information still has value relevance in the case of the paradox between Green Mission and ESG ratings. From a practical perspective, this study provides empirical evidence that ESG ratings have important reference value for corporate managers, highlighting the impact of ESG performance on corporate market value. For investors, the results support the need to incorporate ESG rating factors into investment decisions.

The robust results of the sensitivity analysis further enhance the reliability of the research conclusions, indicating that even under the setting of different time Windows, the significant impact of ESG events on the market still exists.

However, this study also has some limitations, such as the fact that there may be other events affecting Tesla's stock price during the same period, and the short-term market reaction may not represent the long-term value impact. Since this study used an event study method and only one event from one company was analyzed, the sample was single, and external validity was limited. A further step of research on the value relevance of ESG ratings to companies with green missions would require the inclusion of

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more samples to infer the overall nature.

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