

The Impact of ESG on the Firm Performance: A Case Study on the Large-Cap Companies

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Abstract: In recent years, the principles of sustainable and green development have gained widespread recognition, driving attention toward the environmental, social, and corporate governance (ESG) performance of enterprises. ESG factors have become a critical aspect for evaluating the sustainability and long-term success of companies across various industries. Notably, the new energy vehicle, aerospace, and AI technology sectors are at the forefront of this scrutiny due to their significant impact on both environmental outcomes and business practices. This report focuses on three prominent companies—Tesla, Boeing, and Nvidia—representing these key industries. It examines how ESG factors influence their operations, profitability, and investor perceptions. By analyzing each company's strategies and challenges in managing environmental impacts, social responsibilities, and governance standards, this report provides a comprehensive view of the growing importance of ESG in shaping business outcomes. The findings emphasize the need for companies to integrate sustainable practices into their core operations to maintain competitiveness, attract investment, and contribute positively to society and the environment.

Keywords: ESG Performance, Sustainable Development, Large-Cap Companies.

1. Introduction

ESG is an acronym for Environment, Social Responsibility, and Governance and is an investment philosophy that considers corporate environmental, social, and governance performance in investment decisions. To prompt listed companies to emphasize and enhance ESG performance, the government, regulators, and industry associations have launched a series of policies on strengthening the disclosure of information of listed companies by expanding the ESG sector in their annual reports, enhancing corporate ESG performance, and guiding investors to practice the whole layer of ESG investment concepts.

Previous literature has focused on examining the impact of the individual dimensions of E, S, and G on firm performance and found a basic consensus on the view that good firm governance helps enhance firm value. Still, there is disagreement on the relationship between environmental and social responsibility related to firm value, with positive correlation, negative correlation, and no ties appearing. For example, one previous paper quantitatively analyzed whether the impact of ESG performance would affect firm value and profitability. Their sample data covers 1700 firms from 2013 to 2021 using panel data. They discover a positive and highly significant association between the ESG combined score (ESG_CS) and firm value. Social (SOC) and Governance (GOV) also

strongly correlated with firm value. However, there is no relationship between Environment (ENV) and firm value [1]. Another literature analyzed a company's performance through the PEST model and finally found that the company's performance was excellent while ESG was poor. Therefore, ESG is an important indicator but not a decisive one. ESG is not proportional to corporate performance [2].

Based on previous research on whether the impact of ESG performance would affect firm value, this paper will qualitatively analyze how ESG affects the performance of typical companies in different industries through case studies. In the case of Tesla, this paper will comprehensively summarize the main reasons that caused the company to be removed from the S&P 500 ESG Index and a distillation of the company's key ESG strategies as reflected in its social impact sustainability report. In Boeing's case, This paper will focus on two of Boeing's most central decarbonization approaches, as well as the impact of some societal events on ESG on the company's interests and investor decisions through the cash flow and discount rate channels. For NVIDIA, the primary ESG strategy, as it appears in the company's social impact sustainability report, will also be summarized in this article.

2. New Energy Vehicle Industry: Tesla

Tesla is significant in the new energy vehicle industry and plays a crucial role in driving the global shift to cleaner new energy sources, which is a strength of Tesla's ESG rating, as is its ability to offer new energy vehicle products with low carbon emissions.

However, In 2002, Tesla was removed from the S&P 500 ESG Index in the 2022 Dow Jones Update annual list. From the latest score of Tesla's S&P ESG Index, “S” and “G” are still the shortcomings of Tesla's ESG performance, accompanied by various questions and accusations from society. Rationally analyzing the reasons for this loss of points and analyzing its current and potential future risks, Margaret Dorn, the head of S&P Indices, pointed out that because some old issues have not yet been resolved, here are the five demerit points: Firstly, there is a deficiency in carbon reduction strategies. The carbon emissions during the production of electric vehicles are relatively high, and Tesla still needs to improve its carbon reduction during the manufacturing process. Secondly, regarding the code of business conduct, more than half of the board members of Tesla are friends of Elon Musk, which could influence the decision-making power of some significant business matters. Thirdly, regarding product quality, the National Highway Traffic Safety Administration of the United States has identified 12 accidents related to Tesla's driving system, resulting in vehicle recalls by Tesla. Fourthly, the Fremont factory is suspected of implementing racial segregation and sexual harassment in the workplace, such as abusing black workers. Black workers have been discriminated against in terms of positions, discipline, salaries, and promotions and have been reported by departments and accused by relevant employees. Fifthly, emissions from Tesla factories have caused pollution of volatile organic compounds and environmental contamination, and the US Environmental Protection Agency has fined Tesla on multiple occasions [3]. Actually, S&P Global removed the company from its ESG companies index. This action had negative consequences for the company's stock price. Following a 6.8% drop on May 18, Tesla closed down another 0.05% on May 19th. Tech investor Gene Munster attributed about a third of the drop to the company's removal from the S&P 500 ESG Index.

Tesla has also demonstrated the company's Environment, Social, and Governance strategy. Regarding the environmental impact, Tesla has designed and manufactured a fully integrated ecosystem for energy and transportation that can replace fossil fuel alternatives. Moreover, Tesla minimizes the carbon impact of their operations with a decarbonization strategy. Since society has a rising demand trend for zero direct emission products across energy and transportation, Tesla aims to attain net-zero greenhouse gas emissions across the entire product lifespan, encompassing mining,

manufacture, usage, and end-of-life recycling. Additionally, Tesla incorporates Sustainability Concepts into facility design. For instance, Gigafactory Texas selected low-emissivity, highly efficient windows that were insulated to minimize the building's heating and cooling requirements. It's a new idea in Tesla's push toward sustainable facility design [4]. Still, Tesla can not only put effort limited to Gigafactory Texas, but also in other factories to make progress the sustainable facility design.

Regarding the impact of governance, Tesla takes human rights and data privacy seriously and implements them. At the heart of Tesla's approach to a sustainable future is the ethical treatment of all people and respect for human rights. For example, Tesla is committed to upholding and respecting all internationally recognized human rights in its operations and supply chain, including respect for employees, customers, shareholders, suppliers, and the communities in which people live and operate. Also, Tesla added Board Oversight to oversee the management of Tesla's business, including reviewing Tesla's impact priorities and initiatives of this report. Furthermore, Tesla builds products with privacy and security at their core. Every employee and board member must protect data privacy as a shared duty. Tesla's concept of protecting customer privacy is implemented from the beginning, and afterward, it always gives customers choices about their data, giving them a clear and transparent way to manage their data through transparency and Tesla implements rigorous controls and standards to protect the security, confidentiality, and integrity of Tesla's data environment [4].

Regarding social impact, empowering employees to build the safest operation, respecting their ideas, and tracking their emotions are things Tesla takes very seriously on a social level. Tesla strives to ensure a healthy and safe workplace, and they use training for employees to proactively allow them to recognize risks before an incident occurs; from 2022 to 2023, the ASTM Rate of workplace injuries dropped from 2.86% to 2.51%. Then, Tesla allows its employees to suggest ways to enhance the environment, people, safety, security, etc. Cross-functional ownership and anonymity are also accepted for submissions. Moreover, Tesla continued to use the Employee Engagement Survey in 2023 to get feedback from employees on work, culture, the leadership group, job satisfaction, and prospects for professional advancement. In the company's engagement feedback, more than 80 percent of respondents agreed they were generally satisfied with their work at Tesla, and management's feedback had a clear growth path. Amazon places more emphasis on productivity and neglects the emotional health of its employees, leaving them physically and mentally exhausted in a high-pressure work atmosphere, compared to Tesla, whose CEO, Elon Musk, has said that he values the opinions and feedback of his employees and encourages them to contact him directly. Furthermore, Tesla takes avoiding child labor very seriously in its supply chain management. The company has made it clear that it will not source cobalt from mines that use child labor and ensures supply chain compliance by implementing audits and monitoring mechanisms to confirm the presence of child labor [4].

Tesla's mission statement should be an essential reference point, but examining how the company's actions in practice balance business objectives with social responsibility is even more critical. The company's emphasis on ESG should not be judged solely by its mission statement but should be combined with specific practices and actions to ensure they are practiced. Considering these key aspects together, a more comprehensive assessment of Tesla's ESG performance and future prospects can be made by investors and society.

Furthermore, Tesla's Autopilot function is often questioned, and its chance of incident failure is very high. A Tesla car collided with a trailer in May 2016 in Florida, killing the driver. The National Highway Traffic Safety Administration (NHTSA) investigated whether Tesla's Autopilot feature was performing as the public expected it to, and Tesla's stock price fell 3% after the accident was investigated. The involvement of Tesla's regulators in the investigation is an oversight of corporate governance and social responsibility. Investors may be concerned about the company's risk

management practices and ethical standards, and this uncertainty and negative events may affect its ESG performance and sustainability. As a result, a lack of regulatory oversight may lead to a loss of investor confidence, which may affect the company's share price performance.

3. Aerospace Industry: Boeing

Boeing plays a crucial role in ESG. As a leading aerospace company, Boeing is committed to driving environmental innovation, reducing carbon emissions, and focusing on employee well-being and corporate governance. Its supply chain responsibility and ethical operations also underscore the importance of social responsibility. By following ESG principles, Boeing strives to achieve its sustainability and social responsibility goals.

Regarding the impact of ESG on Boeing and Boeing's concept of sustainability in terms of social impact, this essay will focus on listing two essential concepts: renewable energy and contrail.

Boeing supports their customers and governments around the globe in committing to their climate change ambition, including their commitment to achieve net-zero carbon emissions by 2050. The most critical Decarbonizing Aerospace Strategy is Renewable Energy. Renewable energy can be generated through advanced energy carriers, such as sustainable aviation fuel (SAF), an alternative liquid fuel generated by chemical reactions from various sustainably and repeatedly obtained feedstocks. Boeing Scientific research shows that when produced sustainably, SAF can reduce CO₂ emissions by up to 80% over the entire aircraft life cycle compared to petroleum fuels. The SAF offers the most tremendous potential to reduce carbon emissions over the next 20 to 30 years, and the SAF is widely recognized [5]. However, adopting an SAF is one of many ways to support Boeing's projected goal of reaching zero carbon emissions by 2050. Boeing can continue to advance the possibilities of other renewable energy carriers to enhance its irreplaceability in its decarbonization strategy.

On the other hand, Boeing is also committed to comprehending and reducing the harmful consequences of climate change resulting from non-CO₂ aircraft engine combustion emissions and effects, such as contrails and aviation-induced cloudiness. Sustainable aerospace has persistent contrails that can trap heat and cause a warming effect. Although their impact on global warming is difficult to quantify, significant efforts are underway to enable the mitigation of their warming effects. Boeing is bringing the right players together for research to help the industry mitigate the impact of contrails through advanced engine combustion technology, cleaner fuels, better predictive models, and brighter flight paths [6]. It is just one of the many ways Boeing is working to maintain the benefits of aviation while reducing its climate impact.

With society's growing focus on corporate responsibility and sustainability, corporate interests are also affected by ESG, which has become a focus of investor and stakeholder attention. For example, The Boeing whistleblower suicide incident, because of the inaction of Boeing management and inhumane things, will affect the market to classify Boeing as a high-risk company. The market will adjust the risk value higher, and the expected rate will increase by the point. The discount rate reflects an investor's risk assessment of future cash flows, and an increase in the discount rate will result in a decrease in the present value of Boeing's future cash flows. A higher discount rate makes Boeing's return on investment unattractive, potentially leading to lower capital expenditures and impacting the company's long-term growth potential. Regarding the cash flow channel aspect and litigation costs, Boeing could face lawsuits from families, employees, or regulators, which would increase legal fees and penalties. Also, for reputational damage, the incident may lead to a decrease in customer trust in Boeing, resulting in a reduction of market share and, thus, a decrease in future cash inflows.

On the other hand, The revelation of the Boeing 737 MAX incident has brought the community's attention back to quality control, systems engineering, human factors, corporate behavior, and customer service, which potentially poses a severe threat to flight safety [7]. There is a tradeoff

between short and long-term quality control. In the short run, due to the lack of strict quality control and employee training, Boeing may reduce training and labor costs in the short term, providing a temporary cash-flow benefit and reducing spending. However, in the long term, defective products may be put on the market, resulting in safety risks. After causing safety problems, Boeing will face a massive product recall, affecting the company's reputation and incurring colossal repair and replacement costs. Recall repairs will result in significant cash outflows, negatively impacting the company's financial health. Recalls can lead to lower future cash flows as customers' trust in the company declines, reducing share and impacting long-term revenue.

4. AI Technology Industry: Nvidia

Nvidia pioneered accelerated computing to help solve the most challenging computational problems. It has also made notable contributions to environmental sustainability. By integrating AI-driven solutions with cutting-edge hardware, Nvidia has effectively combined software and hardware innovations to manage carbon emissions and curb pollution.

Regarding greenhouse gas reductions, NVIDIA has reduced its carbon footprint to a level lower than its peers. NVIDIA's report shows that its carbon emissions are 3,692,423 MTCO₂e, with the majority concentrated in Scope 3 (mainly from their industrial chain suppliers), and that NVIDIA expects to achieve and maintain 100% regenerative electricity for its office and data center operations by the end of 2025 (current 76%) [8]. Through this commitment, NVIDIA aims to reduce carbon emissions in Scope 1 and Scope 2 (mainly from office and data center energy consumption) in line with climate science standards. NVIDIA's focus on supply chain responsibility is also an essential aspect of the ESG assessment, reflecting their sense of responsibility on a social and environmental level. NVIDIA's efforts toward carbon reduction and sustainability goals are significant in its business operations and positively impact the industry and ecological levels.

In the report, the racial makeup of NVIDIA's employees in the U.S. is dominated by Asians at 55.9%. In contrast, Hispanics and African Americans are underrepresented, accounting for only 5.3% and 1.6%, respectively, and in terms of gender balance, only 23% of total employees are female [8]. However, NVIDIA has tried expanding its talent discovery across different backgrounds and specialties. Not only have they implemented the values of diversity, equality, and inclusion into their recruiting process, but they also have specialized personnel dedicated to assisting women, African-Americans and Hispanics, and members of the military veteran community in participating in NVIDIA interviews. At the same time, NVIDIA also ensures that its salaries are better than its peers. On the one hand, NVIDIA scrutinizes the salaries of its peers; it makes annual salary adjustments based on the growth of the overall market as well as the performance of the individual.

In the face of the rapid development of AI technology and its potential risks, Nvidia has established an AI ethics monitoring mechanism that is responsible for advising on the development of generative AI to ensure that AI technology is innovative and ethical at the same time [9]. On the other hand, NVIDIA has developed comprehensive risk management models and AI management guidelines, such as Model Card++ and checking dashboards, to ensure that AI models are safe and trustworthy and that the entire process is subject to NVIDIA's monitoring and management, reflecting their responsible attitude toward the development of AI technology [10].

NVIDIA's high level of ESG disclosure and the fact that its business meets the critical global warming threshold of staying below 1.5 degrees Celsius is what makes NVIDIA one of the best performers in the large-cap space.

5. Conclusion

The purpose of the paper is to analyze the impact of ESG on firm value. This article summarizes three of the most ESG-representative companies in the New energy vehicles, Aerospace, and AI technology industries: Tesla, Boeing, and Nvidia. Those representative companies pay attention to ESG issues because they need to maintain their business reputation and long-term growth as investors and society demand more social responsibility and sustainability from them.

Tesla performs well on ESG, but there are some areas for improvement. Tesla also has some challenges in terms of the environment. For example, the manufacturing and recycling processes of electric vehicle batteries generate some environmental pollution. Tesla needs to continue to strengthen the research and development of battery technology to improve the energy efficiency of batteries and reduce environmental pollution. In terms of social responsibility, although in the Social Responsibility Sustainability Report, Tesla points out that it is essential to treat employees of different races equally and with respect, the reality is still not absolutely implemented, and gender discrimination and racial discrimination still happen in Tesla factories. For the challenges in Tesla's corporate governance. Elon Musk, the founder and CEO of Tesla, has a strong personality and considerably influences the company's decisions. This may lead to centralization of corporate governance and decision-making risks. Therefore, Tesla could also take further initiatives to improve these problems.

Boeing has tried to achieve a future decarbonization strategy and promote a sustainable business strategy. However, the Boeing 737 incident and the whistle-blower suicide are partly indicative of Boeing's lack of regulatory oversight and lack of social responsibility, and these scandals have had a severe impact on the company's reputation and stock price. NVIDIA has a very impressive track record, which can be attributed not only to NVIDIA's AI technology focus and breakthroughs but also to ESG's good performance.

The ESG outlook of these three companies demonstrates the diversity and challenges in the industry. Tesla is at the forefront of renewable energy and electric vehicles but still needs to improve its social responsibility and governance to increase its ESG index. Boeing faces safety and compliance issues. NVIDIA is favored by ESG investors, particularly in the area of artificial intelligence, although it still faces challenges in energy consumption and carbon emissions. This highlights the balance that companies that succeed in ESG need to strike on a number of fronts to achieve sustainability goals and earn investor trust.

References

- [1] AYDOĞMUŞ, M., GÜLAY, G., & ERGUN, K. (2022). *Impact Of Esg Performance On Firm Value And Profitability*. *Borsa Istanbul Review*, 22(2), S119–S127.
- [2] He, Y., Liu, Y., & Pu, Q. (2024). *Is ESG a “Scam”? Correlation between ESG and Corporate Performance*. *Highlights in Business Economics and Management*, 24, 1485–1493.
- [3] Goldhaber, M. (2023). *Making ESG Real: A Return to Values-Driven Investing*. https://bhr.stern.nyu.edu/wp-content/uploads/2022/03/NYUCBHRMakingESGReal_Oct30OnlineFinal.pdf
- [4] Tesla. (2023). *Impact Report 2023*. Tesla. https://www.tesla.com/ns_videos/2023-tesla-impact-report.pdf
- [5] Boeing company. (2024). *2024 Sustainability & Social Impact Report*. <https://www.boeing.com/content/dam/boeing/boeingdotcom/sustainability/pdf/2024-boeing-sustainability-socialImpact-report.pdf?v=0710>
- [6] Boeing Company. (2023). *Contrail Fact Sheet*. In <https://www.boeing.com/content/dam/boeing/boeingdotcom/principles/environment/pdf/Contrails-FactSheet.pdf>.
- [7] Johnston, P., & Harris, R. (2019). *The Boeing 737 MAX Saga: Lessons for Software Organizations*. <https://embeddedartistry.com/wp-content/uploads/2019/09/the-boeing-737-max-saga-lessons-for-software-organizations.pdf>
- [8] NVIDIA. (2024). *NVIDIA Sustainability Report Fiscal Year 2024*. <https://images.nvidia.com/aem-dam/Solutions/documents/FY2024-NVIDIA-Corporate-Sustainability-Report.pdf>

- [9] Lu, Q., Zhu, L., Xu, X., Whittle, J., Didar Zowghi, & Jacquet, A. (2023). *Responsible AI Pattern Catalogue: A Collection of Best Practices for AI Governance and Engineering*. *ACM Computing Surveys*, 56(7).
- [10] Adu-Gyamfi, Y. (2019). *GPU-Enabled Visual Analytics Framework for Big Transportation Datasets*. *Journal of Big Data Analytics in Transportation*, 1.