The Impact of the Update of Sustainable Development Information Disclosure Standards on Traditional Fuel Vehicle Companies - Taking Mercedes-Benz as an Example

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Abstract. In June 2023, the International Financial Reporting Standards Foundation (IFRS Foundation) released the International Sustainability Standards Board (ISSB)Standards, which established a unified and updated global framework for sustainability reporting, thereby ushering in an era of standardized sustainability information disclosure globally. So far, more than 20 countries, including China, have announced the adoption or reference of the ISSB standards, among which the new standards have exerted a significant impact on the subsequent development of traditional fuel vehicle companies. This study employing Mercedes-Benz as a case company, based on the Mercedes-Benz market return rate data and the German DAX30 market return rate data on the Investing.com website, and application of the short-term event study methodology and univariate linear regression analysis to comprehensively analyze the impact of changes in sustainable information disclosure standards on the traditional fuel vehicle industry. The study found that changes in sustainable disclosure policies have heightened the sensitivity of Mercedes-Benz's stock price, and policies have compelled corporate transformation. Mercedes-Benz's active adoption of the International Sustainability Standards Board (ISSB) standards has fostered positive investors expectations for the company's long-term competitiveness under the new standards.

1 Introduction

In recent years, the international community has heightened international focus on environmental protection and sustainable development. Although the ESG framework has been revised and updated in recent years, it is still fragmented and complex. In addition, other disclosure standards such as TCFD (Task Force on Climate-related Financial Disclosures), SASB (Sustainability Accounting Standards Board), and Global Reporting Initiative (GRI) each have their unique disclosure requirements, and the voluntary disclosure requirements of enterprises make it more difficult to verify compliance [1]. To meet the strong desire of various capital market participants such as investors and creditors for unified and reliable disclosure information, and to mitigate market information fragmentation, improve

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information quality and comparability, strengthen corporate governance and risk management, and foster global financial stability, the International Financial Reporting Standards Foundation released "International Financial Reporting Standards Sustainability Disclosure Standard"(IFRS S1&S2) on June 26, 2023, integrating the previous TCFD, SASB, GRI and other voluntary disclosure framework standards. The International Sustainability Standards Board (ISSB) standards are progressively becoming a global, unified, sustainable disclosure baseline. The ISSB standards not only unify multiple sets of disclosure standards, but also expand the scope of mandatory information disclosure, and focus on financial and climate-related issues, elevating the disclosure quality and requirements of various companies in carbon emissions, climate change information disclosure, dual materiality (including "financial materiality" and "impact materiality") [2,3]. According to the research results, the ISSB standards' disclosure requirements for climate and environment and for social and regional development plans have a significant positive impact on the return on equity and net profit margin of entities [4-6]. In order to adapt to the trend of sustainable development and environmental and energy protection, many new energy vehicle brands have emerged in the market, such as BYD, Xiaomi Auto, Tesla, etc. New energy vehicles have gradually been accepted by the public and gradually become popular in society. Under this development trend, how should the traditional fuel vehicle industry respond, and how will it develop in the future? This has significant implications for the traditional fuel vehicle industry to formulate new development policies. Concurrently, the ISSB standards place significant focus on carbon emissions accounting for traditional fuel vehicles in scope 1 direct emissions and scope 2 purchased electricity emissions. The disclosure focuses on fuel efficiency improvement and exhaust gas treatment technology. The accounting scope is wider and imposes higher requirements than those for new energy vehicles. In terms of carbon reduction targets, the battery recycling production line of new energy vehicles has a relatively mature system. Although traditional car companies have set relevant carbon reduction targets, their decarbonization actions in the supply chain are very slow, largely attributable to the main power source of traditional vehicles [2,3]. So far, international research on sustainable development information disclosure in the automotive industry has mainly focused on the new energy vehicle industry, and the research content is mainly about the disclosure content and focus, quality and influencing factors, and stakeholders' concerns and responses. However, there is a paucity of specific international research addressing on how to apply sustainable development strategies to the daily operations of enterprises, what impact this large-scale adjustment of information disclosure standards has on different industries, and how companies in different industries should adjust to navigate this evolving landscape. This study is based on a comparison of ISSB standards and GRI, SASB and other standards, taking Mercedes-Benz Group as a case company, combined with the actual development of Mercedes-Benz in recent years, using short-term event study method and univariate linear regression analysis to comprehensively analyze the impact of sustainable development information disclosure on the traditional fuel automobile industry and put forward relevant suggestions.

2 Case introduction

2.1 Company profile of Mercedes-Benz:

Mercedes-Benz Group was formally established in Stuttgart, Germany in 1926 and is one of the world's largest luxury car manufacturers. The power source of Mercedes-Benz's early cars was mainly internal combustion engines. In 1886, the "Mercedes-Benz I" opened the era of cars powered by Internal Combustion Engines (ICE). Since 2010, Mercedes-Benz has

begun to explore hybrid technology for cars, and has gradually transitioning its power train focus from internal combustion engines to hybridization. Before 2023, Mercedes-Benz's sustainability report mainly adhered to the TCFD framework and SASB industry standards. On June 26, 2023, after the ISSB standards were released, Mercedes-Benz explicitly stated in its 2023 Sustainability Report that its climate-related disclosures have referred to the ISSB standards framework and integrated with TCFD recommendations. In 2024, Mercedes-Benz has fully referenced the ISSB standards report, but because Mercedes-Benz is headquartered in Germany, its report is also potentially influenced by the EU CSRD and ESRS standards [7].

2.2 Case analysis

2.2.1 Evolution in information disclosure standards before and after ISSB promulgation

Before the ISSB was released, corporate sustainable development information disclosure was mostly voluntary, lacking unified mandatory requirements, so the content and quality of disclosures by various companies varied greatly. In addition, there was no clear focus and unified standards for corporate disclosures, and the content disclosed by companies was not in-depth and specific, and the comparability and consistency were poor. Previous TCFD, SASB, GRI and other standards did not mandate the disclosure of content related to financial reports, so sustainable development information disclosure and traditional financial reports were relatively independent.

After ISSB was published, there are two sustainability disclosure standards, namely IFRS S1 and IFRS S2. This standard is mandatory and entities must disclose the content required by the standard for users' reference.

IFRS S1 refers to the general requirements standard, which stipulates the general requirements for companies in the disclosure of sustainability-related financial information. IFRS S2 is the climate standard, which provides specific guidance on how to report climate-related risks and opportunities, aiming to improve the transparency and comparability of climate information. The core content of both is divided into four sections: governance, strategy, risk management, indicators and targets. Each section requires entities to disclose policies, measures, specific processes, and impacts on the entity's business model and value chain regarding addressing climate and sustainable development-related risks and opportunities. In addition, relevant financial information such as financial status, financial performance and cash flow must also be disclosed at the same time, which integrating the disclosure of sustainable development information and traditional financial reports into an organic whole [8-10].

2.2.2 Changes in Mercedes-Benz information disclosure report content

Mercedes-Benz's 2021 and 2022 sustainability reports mainly cover the sustainable development strategy, corporate governance, environmental aspects (mainly including climate, resource consumption, etc.), and social aspects (related to employee development and CSR). The two reports exhibited high disclosure quality and complete content, and fully cover the three dimensions required to be disclosed by ESG guidelines. Data accuracy: the data disclosure on the relevant environmental aspects is detailed and reliable. Timely updates and relevance: the report promptly updates the development progress of the company's project goals in the previous year, and the disclosure content on the social level is also stakeholder-oriented.

The 2023 report adopts the ISSB standard framework specifically for the environmental aspect, significantly expanding the scope, increasing the disclosure of relevant policies, impacts and data from production and supply chain to carbon emissions management. Increased disclosure of the impact and balance of climate-related sustainable development risks and opportunities. In general, the disclosure quality of this report is surpassed before. According to the requirements of IFRS S2 of the ISSB standard, more disclosure content has been incorporated, and the relevant data and indicators are more detailed. However, the phased decomposition of long-term goals, the disclosure of phased goals and progress in this report is relatively general, lacking granularity and completeness, and lacks horizontal comparison, and lack comparison of key indicators with peers.

The 2024 report fully implemented the ISSB standards. Compared with the 2023 report, it adds the disclosure content required by IFRS S1, and increases the disclosure of company profile, financial information, status, etc. This report was marked the first time that Mercedes-Benz has fully integrated the sustainability report into the annual report, demonstrates strong framework compliance with the CSRD, ESRS and ISSB standard framework. The report is compliant with the framework, the data is detailed and traceable, and it is highly stakeholder-oriented. In terms of shortcomings, some risk disclosures and long-term goal progress disclosures are somewhat vague, and the disclosure details of the supply chain and value chain need for strengthened detail [10].

2.2.3 Short-term event study method

The short-term event study method is adopted, utilizing the release date of Mercedes-Benz's 2023 Sustainability Report on July 16, 2024 as the event date, July 14 to July 18, 2024 as the event window period, and January 18 to July 3, 2024 as the estimation window. The stock price of Mercedes-Benz during this period and the stock price of its market, the German DAX30, are obtained from the Investing.com website. A univariate regression analysis is performed to yielded the following data. As shown in Figure 1, Figure 1 depicts a univariate linear trend chart of Mercedes-Benz's market return Ri and its market return Rm in the German DAX30 market. The figure reflects the relationship between Mercedes-Benz stock returns and market returns (market model). The slope β refers to the systematic risk coefficient, representing systematic risk. Mercedes-Benz's β is less than 1, indicating that the volatility of Mercedes-Benz's stock price is less than the overall market volatility. Consequently, Mercedes-Benz is a relatively defensive low-volatility stock. The intercept α represents the expected return of Mercedes-Benz stock when the market return is 0. Here α is 0.0002, which is approximately zero, and is thus negligible. The upward trend of the trend line confirms that the overall stock return of Mercedes-Benz is positively correlated with the market return of the German DAX30, which is in line with the general market law. However, the β coefficient is less than 1, can be characterized as the stock price of Mercedes-Benz is mild in response to market fluctuations. Among them, the CAR of 1.31% and the AAR of 0.26% suggests that during the time window of Mercedes-Benz adopting the new disclosure standards, the German market's overall reaction to the stock price of Mercedes-Benz is positive, which shows that investors have positive expectations for Mercedes-Benz's long-term competitiveness under the new standards, such as green transformation and enhancing brand reputation. In addition, the β coefficient is a significant 0.76, the P value is 0.000, less than 0.01, and the regression coefficient is statistically significant at the 1% level. It can confirming a highly significant linear relationship between the market return and the stock return of Mercedes-Benz , and market risk is the main influencing factor leading to this result. This just confirms the disclosure requirements of the ISSB standards for entities to disclose sustainable development risks and opportunities, which effective;y compelling the entity

"policy-forced transformation". It can be seen that the ISSB standards have a significant impact on the development of Mercedes-Benz in the relevant market and the company's subsequent strategy. R^2 is the coefficient of determination, which indicates the proportion of changes in the market rate of return that can explain changes in Mercedes-Benz stock returns. R^2 is only 0.1615, which is relatively small, indicating that Mercedes-Benz's stock price during the event window was predominantly driven by non-market factors, namely, company-specific events - the use of ISSB standards for information disclosure significantly impacted. It can be seen that ISSB standards directly affect Mercedes-Benz's ESG compliance costs and investors' expectations of Mercedes-Benz, and this impact far exceeds the market fluctuations during the same period, which is the same as the results reflected by the CAR and AAR data. It also shows that the ESG carbon emission pressure faced by Mercedes-Benz makes its stock price more sensitive to sustainable information disclosure policies [6].

There are three deviate noticeably, namely February 22, April 30 and May 9, 2024. The value on February 22 is significantly higher than the trend line, while the values on April 30 and May 9 are significantly lower than the trend line. On February 22, Mercedes-Benz proactively issued a profit warning and electrification challenges, which increased investors' investment. On April 30, capital market reforms and weak manufacturing PMI fostered short-term negative sentiment, causing Mercedes-Benz's stock price to fall. On May 9, the new lithium battery policy promoted a surge in the new energy sector, and the price war among competitors in the new energy vehicle industry deepened, greatly increasing the pressure on Mercedes-Benz's electrification transformation, leading to Mercedes-Benz's stock price to fall.

Mercedes-Benz short-term event study method (univariate linear trend chart of the German DAX30 market return Rm and the Mercedes-Benz company return Ri)

$Y=0.7599x+0.0002$, $R^2=0.1615$, $\alpha=0.0002$, $\beta=0.7599$, AAR=0.26%, CAR=1.31%.

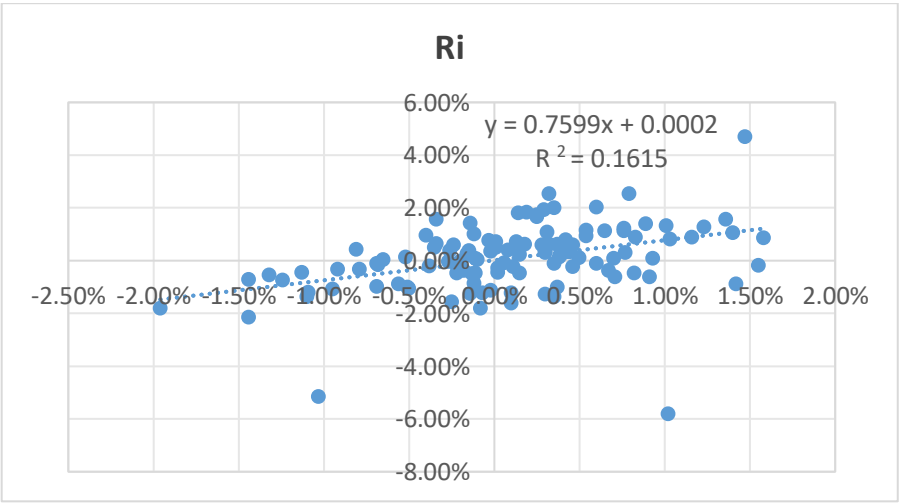

Fig. 1. Short-term event study method (Picture credit: Original)

(Data from the Investing.com website, using the historical data of Mercedes Benz Group AG (MBGn) to 2024 and the historical data of the German stock market DAX30 index, https://cn.investing.com)

Using short-term event study data, use the regressit plugin to perform univariate regression analysis

In the table 1, β coefficient: 0.76, P value is 0.000, which is less than 0.01, and the regression coefficient is significant at the 1% level.

Table 1. The regressit

Model:	Model 1							
Dependent Variable:	Ri							
	R-Squared	Adj.R-Sqr.	Std.Err. Reg.	Std.Dep. Var.	#Fitted	#Missing	Critical t	Confidence
	0.162	0.154	0.012	0.013	117	0	1.981	95.00%
Variable	Coefficient	Std.Err.	t-Statistic	P-value	Lower 95%	Upper95%	VIF	Std.Coeff.
Constant	0.000162	0.001106	0.146	0.884	-0.002029	0.002352	0.000	0.000
Rm	0.760	0.161	4.707	0.000	0.440	1.080	1.000	0.402
	Mean Error	RMSE	MAE	Minimum	Maximum		A-D*stat	
Fitted(n=117)	0.000	0.012	0.007871	-0.066	0.036		2.71(P=0.000)	

In addition, from the perspective of signal transmission theory, there is information asymmetry between enterprises and stakeholders, and the two parties have different information. In this case, the party possessing superior information can influence the other party's behavior or decision by transmitting specific signals to prove its value or ability to the other party. Mercedes-Benz, as a company with more information, utilizes information disclosure to convey the company's true internal situation to stakeholders, showcasing its brand image and corporate CSR, and improving users' trust and loyalty to Mercedes-Benz. Mercedes-Benz actively adopts the ISSB standards, discloses company information more comprehensively from more levels, and transmits stronger, more credible signals to signal recipients (e.g investors, customers), thereby increasing users' understanding of the Mercedes-Benz brand, fosters greater market trust and recognition, and ultimately benefits the company. At the same time, the trust and recognition of the brand by the market and users also reversely require the brand itself to improve its resource allocation capabilities and risk management capabilities and create more products and services that meet the needs of the modern market, driving the creation and create a reciprocal demand, thus establishing a virtuous cycle.

3 Mercedes-Benz's subsequent development policy evolution

In 2016, Mercedes-Benz launched the EQ brand and began to focus on the field of electric vehicles. After 2024, Mercedes-Benz intensified its commitment the development of automotive electrification, setting a plan to achieve an electrification goal of more than 30% of global new energy vehicle (BEV) sales by 2027, and launched a number of pure electric models. Implementing technological R&D upgrades, aiming to reduce the cost of lithium

iron phosphate batteries by 30%, and optimize battery technology. In addition, directed towards MB. OS architecture, dedicated BEV platforms (such as VAN.EA) and modular drive technology. In 2025, Mercedes-Benz released the new pure electric CLA, further advancing its BEV portfolio of Mercedes-Benz's pure electric models. In addition, it has exploring alternative power train technologies, such as solid-state batteries and hydrogen fuel cells. Mercedes-Benz has been conducting research on new energy technologies. In recent years, it progressively shifting its focus towards pure electric vehicles and new energy. Development in the automotive industry.

4 Conclusion

ISSB standards represent a significant unification and upgrade of the previous multiple disclosure standards frameworks. They are more stakeholder-oriented and mandate that entities to disclose more information such as climate, finance, and sustainable development risks and opportunities for users and the market to refer to. ISSB standards undeniably strengthen the quality of entity information disclosure and imposing greater demands for entities. Mercedes-Benz, as a traditional fuel vehicle manufacturer, although it commenced later in turning to hybrid vehicles, the requirements of ISSB standards directly affect Mercedes-Benz's ESG compliance costs and shape investors' expectations of Mercedes-Benz, and this impact demonstrably outweighed the market fluctuations during the same period. Changes in sustainable disclosure policies have heightened the sensitivity Mercedes-Benz's stock price. The policy effectively compelling corporate transformation. Mercedes-Benz has actively adopted ISSB standards to generated positive investor sentiment for Mercedes-Benz's long-term competitiveness under the new standards. Since then, Mercedes-Benz has accelerated technical research and development in the field of pure electric vehicles, namely new energy vehicles. Sustainable development and low carbon emissions are global development imperatives. Other traditional fuel vehicle companies should proactively adapt to this development trend and transform market risk pressure and transform pressure into competitive advantages strategically adjusting, actively implement new technology research and development, and progressively transitioning to the field of new energy vehicles.

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