IIAI Open Conference Publication Series
IIAI Letters on Business and Decision Science
Vol. 005, LBDS397
DOI: https://doi.org/10.52731/lbds.v005.397

A Study on the Key Factors for the Success in Evaluating Fast Fashion Enterprises' Brand Value Based on ESG

Chia-Chi Hsu [*], Teng-Sheng Su [*]

Abstract

In the rapid development of the fast fashion industry, consumers benefit from low prices, up-to-date fashion trends, and diverse styles. However, this industry model also presents significant challenges in terms of environmental, social, and corporate governance (ESG). Issues such as the depletion of natural resources, water pollution, child labor, low wages, cost pressures, and kick-backs in corporate governance have drawn widespread attention. Therefore, this study employs the Analytic Hierarchy Process (AHP) to explore the key indicators of ESG implementation in fast fashion companies, evaluating them across the three major dimensions of environment, society, and corporate governance. This study highlights that the core of sustainable development for enterprises should focus on carbon emission management, actively promoting reduction measures to minimize environmental impact. This strategy not only complies with global environmental regulations but also enhances the company's competitiveness, strengthens the brand's green image, and attracts environmentally-conscious consumers, fostering brand loyalty.

Keywords: Fast fashion, ESG, AHP, ESG evaluation criteria

1 Introduction

In this rapidly changing fashion industry, fast fashion has become the best choice for many people when shopping. Fast fashion focuses on fast production and mass production, which uses a large amount of water and emits a lot of greenhouse gases. Therefore, fast fashion is also labeled as environmentally unfriendly. Research data shows that the fashion industry emits up to 10% of global carbon dioxide emissions [1], almost equivalent to the total emissions caused by global ocean transportation and international flights.

Faced with increasing ESG awareness, fast fashion brands must find suitable ESG practice strategies. This study aims to analyze and evaluate successful cases and implementation measures of fast fashion brands, identify their key success factors in ESG practices, and assist in the effective transformation of the industry.

2 Literature Review

This study explores the development trends of the fast fashion industry in terms of Environmental, Social, and Governance (ESG) aspects and their impact on brand value and competitiveness. As

[*] National Kaohsiung University of Science and Technology Kaohsiung 824004, Taiwan

global attention to sustainable development grows, a company's ESG performance not only affects its social image but also its long-term competitiveness. Therefore, this study will analyze the strategies and challenges fast fashion brands face in meeting ESG criteria.

Additionally, this study examines how ESG influences brand value and how companies can enhance brand value and market competitiveness through ESG strategies. To systematically assess the impact of ESG on brand value, the study will adopt the Analytic Hierarchy Process (AHP) to establish an analytical framework that helps businesses understand the long-term benefits of ESG strategies.

Through a comprehensive literature review and empirical analysis, this study aims to provide deeper insights into the competitive strategies of fast fashion brands and offer practical recommendations for enhancing brand value.

2.1 Fast Fashion

Fast fashion has experienced rapid expansion since the 1980s, with the core of accelerating the process of goods from design to retail in order to respond quickly to market demands. This retail business model (SAP) greatly shortens the time to market and reduces production costs by vertically integrating all aspects of product planning, design, production and sales. As a result, fast fashion brands attract consumers with short production cycles, low cost, and affordable, high-frequency new product launches [2]. Today, this model has been widely used in the fashion industry and has become one of the representatives of modern consumer culture.

As consumers become more environmentally conscious, more and more people are rethinking their fast-fashion consumption patterns and turning to more sustainable fashion options. This has also prompted some fast fashion brands to explore sustainable business models to reduce their environmental impact by introducing eco-friendly materials, improving production techniques and promoting used clothing recycling programs. These shifts will redefine the future of fashion.

2.2 ESG

Human society continuously pursues progress, and the world today faces unprecedented opportunities and challenges. In 2020, several "black swan" events occurred, such as the global spread of COVID-19, U.S. stock market crashes, locust plagues in Africa, and Luckin Coffee's financial fraud delisting. As a framework for addressing global challenges, ESG has become a key issue in promoting sustainable development.

ESG encompasses three dimensions: environmental, social, and corporate governance. The environmental aspect focuses on resource utilization, carbon emission control, and environmental protection measures [3]. Strong ESG performance enhances brand reputation, attracts talent, and strengthens competitiveness, contributing to long-term business growth.

Therefore, ESG is not only a tool for evaluating corporate sustainability but also a crucial factor in enhancing competitiveness and investor trust. Companies should actively improve ESG performance to achieve a win-win situation for the environment, society, and the economy.

2.3 Brand Value

The brand value provided by manufacturers can not only bring emotional resonance to

consumers, but also establish their trust in the brand; For its commercial customers, brand value is more reflected in rational value, reflecting the superiority of the enterprise in operational efficiency, product quality, and service standards [4]. These value elements together constitute the important attraction of a brand to consumers and business customers, and become the foundation of brand competitiveness. For modern enterprises, brand value not only shapes the core concept of the enterprise, but also represents the belief and mission of the enterprise. This makes the brand not only a commercial symbol, but also a reflection of culture and values.

In summary, brand value is an important asset for a company, as it can shape its core, expand its advantages, and make it stand out in the market. By continuously enhancing brand value, enterprises can win market recognition and support, and achieve sustainable long-term development.

3 The Proposed Method

3.1 Analytic Hierarchy Process Develop

The Analytic Hierarchy Process (AHP), proposed by Saaty from the University of Pittsburgh in 1977, is used for decision-making under fuzzy conditions or multiple evaluation criteria. After years of application, empirical research, and refinement, AHP evolved into a comprehensive analytical method by 1980, influencing management decision-making.

Saaty [5] stated that AHP helps decision-makers systematically analyze complex issues by structuring them hierarchically. Experts compare elements at the same level pairwise to form a comparison matrix, then calculate relative weights to determine the best decision. AHP is applicable to various fields, covering 12 types of problems, as detailed in Table 1.

Table 1: 12 Types of problem

	Solution
1	Planning
2	Generating a Set of Alternatives
3	Setting Priorities
4	Choosing a Best Alternatives/Policy
5	Allocating Resources
6	Determining Requirements
7	Predicting Outcome/Risk Assessment
8	Designing System
9	Measuring Performance
10	Insuring the Stability of a System
11	Optimization
12	Resolving Conflict

3.2 Construct Analytic Hierarchy Process

The Analytic Hierarchy Process (AHP) is a standardized system analysis tool. According to Wu [6], AHP can simplify complex systems into a hierarchical structure, collect opinions from experts or decision-makers, use nominal scales to compare various factors, and establish pairwise comparison matrices to calculate eigenvectors and eigenvalues. These eigenvectors represent the priority order of factors within a level and can serve as decision-making information and

references for re-evaluation.

3.3 Application of Analytic Hierarchy Process

When applying the AHP hierarchical analysis method, there is a set of standard procedures that need to be followed, which can usually be divided into the following six steps：

1. Problem Definition

When defining problems, efforts should be made to expand the scope of the problem, including all possible factors that may lead to the problem, while clearly defining each relevant issue.

2. Establish a hierarchical structure

The hierarchical structure will derive different structures with the number of levels, and the size of each level depends on the number of problems. The relationship between levels needs to be interconnected and cannot be too far fetched. The representation of the problem should start from the first level and extend downwards, and can gradually shift from abstract expression at the top level to concrete expression, which can facilitate the understanding of the problem by the subjects.

3. Questionnaire Design

When conducting pairwise comparative evaluations, the AHP hierarchical analysis method uses the nominal scale for comparison. Saaty proposed nine levels of nominal scales, as shown in the Table 2, and set the proportion range from 1 to 9. By comparing questions pairwise and assigning different weight scores based on the importance of each question.

Table 2: AHP Nomenclature Rules (Adopted by Wu [6])

Evaluation scale	Definition	Illustrate
1	Equally important	Both factors have equally important contributions
3	Slightly important	Experience and judgment are slightly biased towards a certain factor
5	Important	Experience and judgment are strongly biased towards a certain factor
7	Quite important	Actually shows a very strong preference for a certain solution
9	Very important	There is enough evidence to definitely like a certain solution
2，4，6，8	Median value of adjacent scales	Compromise value

4. Create a pairwise comparison matrix

In the hierarchy, compare each factor in pairs and evaluate the relative importance between the two factors. If there are n factors, n (n-1)/2 pairwise comparisons are required, and the comparison results will form the upper half of the pairwise comparison matrix A (the values on the main diagonal represent the comparison between the factors and themselves, so the value is

always 1, while the values in the lower half of the matrix are the reciprocal of the relative p osition values in the upper half, as shown below:

$$A = [a_{ij}] = \begin{bmatrix} 1 & a_{12} & \cdots & a_{1n} \\ 1/a_{12} & 1 & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ 1/a_{1n} & 1/a_{2n} & \cdots & 1 \end{bmatrix} \quad (1)$$

After obtaining the pairwise comparison matrix, it is necessary to calculate its eigenvectors and maximum eigenvalue. The purpose of doing this is to check whether the pairwise comparison matrix meets the requirements of consistency testing. The calculation formula for eigenvectors and maximum eigenvalue is as follows:

(1) Characteristic Wi

$$w_i = \frac{\left(\prod_{j=1}^{n} a_{ij}\right)^{\frac{1}{n}}}{\sum_{i=1}^{n} \left(\prod_{j=1}^{n} a_{ij}\right)^{\frac{1}{n}}} \quad (2)$$

(2) Maximum eigenvalueλmax

$$\begin{bmatrix} 1 & a_{12} & \cdots & a_{1n} \\ 1/a_{12} & 1 & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ 1/a_{1n} & 1/a_{2n} & \cdots & 1 \end{bmatrix} * \begin{bmatrix} W_1 \\ W_2 \\ \vdots \\ W_n \end{bmatrix} = \begin{bmatrix} W_1' \\ W_2' \\ \vdots \\ W_n' \end{bmatrix} \quad (3)$$

$$\lambda_{max} = (1/n) * \left(\frac{W_1'}{W_1} + \frac{W_2'}{W_2} + \cdots \frac{W_n'}{W_n}\right) \quad (4)$$

5. Test of consistency

To verify whether there is a significant difference between the experimental results and real-world conditions, a consistency test can be performed on the pairwise comparison matrix, calculating the Consistency Index (C.I.) and Consistency Ratio (C.R.), in which Random Indicator (R.I.) is the consistency index of the randomly generated matrix, to validate the logical consistency of the results. According to Saaty's recommendation, the corresponding R.I. value can be found according to the matrix order as shown in the Table 3, and if C. I. ≤ 0.1, the evaluation results are consistent [5].

$$C.I = \frac{\lambda_{max} - n}{n - 1} \quad (5)$$

$$C.R = \frac{C.I.}{R.I} \quad (6)$$

n= The number of level factors

λ_{max} = Maximum eigenvalue

R.I.= Random indicator

Table 3: Random indicator table (Adopted by Wu [6])

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
R.I.	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

3.4 Research Topics

Fast fashion plays an important role in implementing ESG and enhancing brand value. Therefore, it is extremely important to understand how the fast fashion industry can develop ESG and enhance its brand value. The brand value of the fast fashion industry is not only reflected in its consumer awareness, but also in whether it can achieve a balance between environmental protection, social responsibility and corporate governance, so as to win the trust of consumers and investors. Specifically, this research focuses on six aspects: environmental protection, environmental innovation, human resources, customers and communities, supply chain social responsibility, and corporate governance.

Based on its research topic, this study uses a hierarchical analysis approach to identify the key factors in promoting ESG development of fast fashion brands, and evaluates the effectiveness of their six aspects. This can not only provide a reference for the fast fashion industry, but also promote fast fashion companies to pay more attention to the sustainable development of brands in the future.

3.5 Research Structure

Based on literature research, this study evaluates the key factors for the success of evaluating the brand value of fast fashion enterprises with ESG indicators, such as environmental protection, environmental innovation, human resources, customers and communities, supply chain social responsibility, and corporate governance.

In this study, the pre-test evaluation between the facets will be carried out, and the evaluation process will be discussed and verified according to the AHP hierarchical analysis method, the indicators and weights of the most suitable facets will be evaluated, and the consistency verification will be carried out to confirm that there are no inconsistencies in the results, and the pre-test results will explain the relevant facets and correct or eliminate the inappropriate facets.

4 Research Method Design

The following is a framework for evaluating the key success factors of fast fashion enterprise brand value in Figure 1. This framework analyzes six dimensions: environmental protection, environmental innovation, human resources, customers and community, supply chain social responsibility, and corporate governance, highlighting the core elements of corporate sustainability.

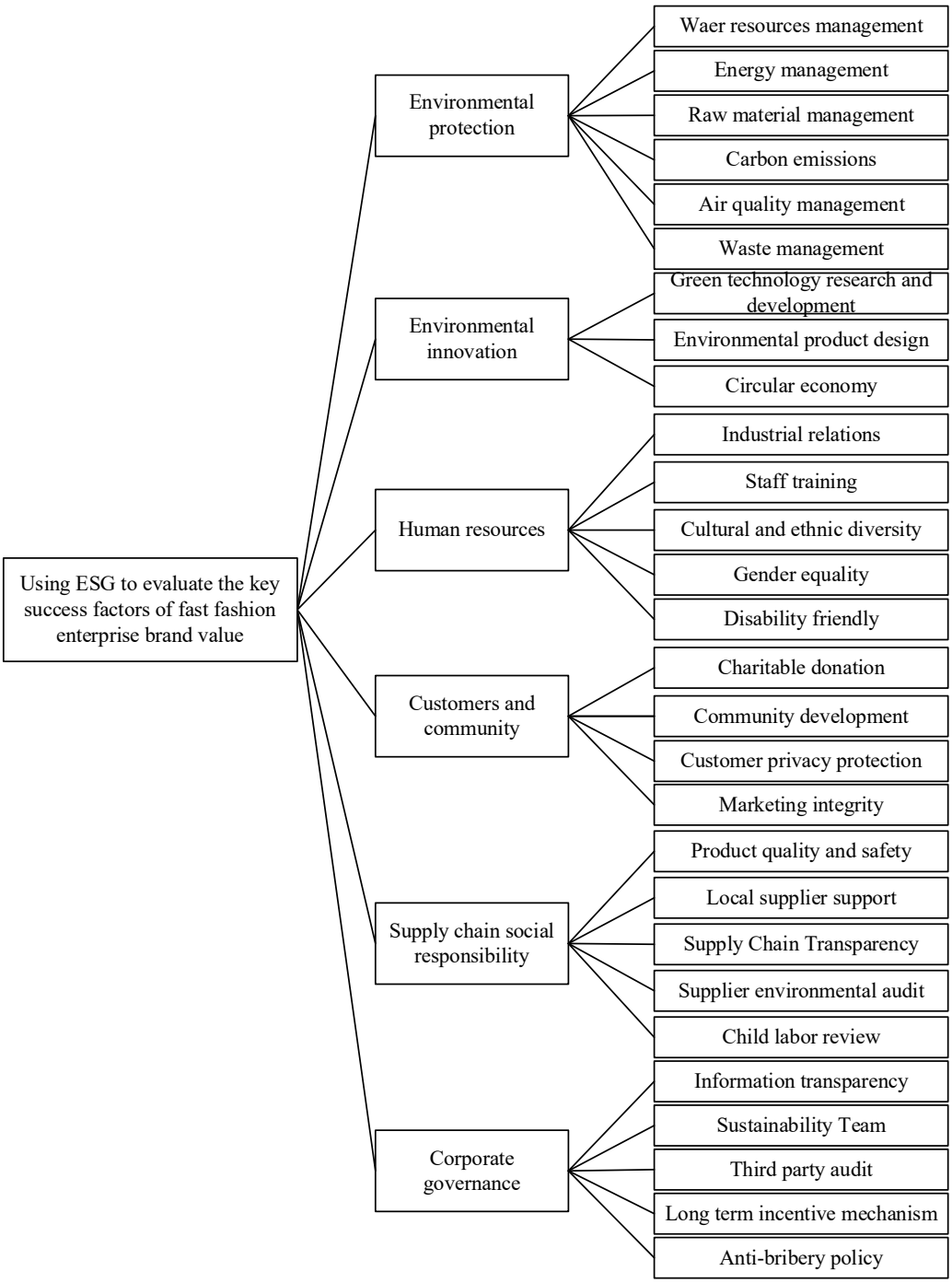

Figure 1: Research architecture diagram

The following are the key success factors for evaluating the brand value of fashion companies using ESG criteria. These standards are divided into six major dimensions: environmental protection, environmental innovation, human resources, customer and community, supply chain social responsibility, and corporate governance. Each dimension outlines specific evaluation criteria and their definitions, from Table 4 to Table 10, aiming to help businesses measure their

performance in sustainable development and how these performances impact the enhancement of brand value.

Table 4: Dimension description

Dimension	Definition
Environmental protection (D1)	Companies reduce their negative impact on ecosystems.
Environmental innovation (D2)	Companies reduce the environmental burden of their manufacturing processes.
Human resource (D3)	Pay attention to employee relations and diversity and inclusion within the company.
Customer and community (D4)	Companies establish good social relations.
Supply chain social responsibility (D5)	Companies establish transparent supply chain mechanisms.
Corporate governance (D6)	The internal operations and regulatory mechanisms of companies.

Table 5: Description of environmental Protection

Evaluation criteria	Definition
Waer resources management (C11)	Reduce water consumption and control effluent discharge.
Energy management (C12)	Use renewable energy sources such as solar, wind, etc.
Raw material management (C13)	Use sustainable materials and reduce the overuse of natural resources.
Carbon emissions (C14)	Reducing CO2 and greenhouse gas emissions.
Air quality management (C15)	Reduce pollutants emitted into the atmosphere, such as sulfur dioxide, nitrogen oxides, etc.
Waste management (C16)	Waste recycling and reuse, and reduction of waste generated when generated.

Table 6: Description of environmental innovation

Evaluation criteria	Definition
Green technology research and development (C21)	R&D and application of environmental protection technologies, such as renewable energy technology and energy-saving equipment.
Environmental product design (C22)	Design and produce products that are environmentally friendly, taking into account the sustainability of product materials and reducing the need for natural resources.
Circular economy (C23)	Design products that can be recovered, repaired, or reused, such as refurbishing second-hand clothing.

Table 7: Description of Human Resources

Evaluation criteria	Definition
Industrial relations (C31)	Ensure that employees are paid fairly and that appropriate benefits such as health insurance, paid time off, and more are provided.
Staff training (C32)	Provide professional skills training to help employees improve their ability and professional competitiveness.
Cultural and ethnic diversity (C33)	Promote cultural and ethnic diversity within the company, avoid racial discrimination, and actively recruit talent from diverse backgrounds.
Gender equality (C34)	Promote gender equality and eliminate gender discrimination.
Disability friendly (C35)	Provide a friendly environment to ensure that every employee can participate in work equally.

Table 8: Description of customer and community

Evaluation criteria	Definition
Charitable donation (C41)	Participate in charity and give back to the society through donations, volunteer services, etc.
Community development (C42)	Work with the community to promote education, infrastructure improvements and other projects that benefit community development.
Customer privacy protection (C43)	Protect consumers' personal information and privacy rights and prevent their data from being used for unauthorized purposes.
Marketing integrity (C44)	Avoid misleading or false advertising and ensure that product information is transparent and truthful.
Product quality and safety (C45)	Provide high-quality, safe products and services.

Table 9: Description of supply chain social responsibility

Evaluation criteria	Definition
Local supplier support (C51)	Prioritize local suppliers to support local economic development.
Supply Chain Transparency (C52)	Disclose supplier information to ensure that consumers can track the production process of each product.
Supplier environmental audit (C53)	The company regularly inspects the working environment of suppliers to ensure safety and protect workers' rights.
Child labor review (C54)	Ensure that child labour is not used in the supply chain.

Table 10: Description of Corporate Governance

Evaluation criteria	Definition
Information transparency (C61)	Make public detailed reports on environmental impact, social responsibility and corporate governance.
Sustainability Team (C62)	Establish a committee or group specifically responsible for sustainable development to ensure that environmental and social rights receive high-level attention and management.
Third party audit (C63)	Engage an independent third-party agency to regularly review sustainability projects.
Long term incentive mechanism (C64)	Through a long-term performance reward mechanism, senior leaders are encouraged to continue to promote sustainable development projects.
Anti-bribery policy (C65)	Ensure that all employees and partners in the company's supply chain follow ethical business practices.

5 Experimental Example

5.1 Questionnaire Analysis

This study mainly focused on the key success factors for fast fashion enterprises in implementing ESG, as identified through a consumer expert survey, and conducted a consistency analysis and evaluation of the 15 valid questionnaires collected.

5.2 Pairwise Comparison Matrix Analysis of Each Aspect Indicator of AHP

This study established a comparison matrix, eigenvalues, and consistency tests through a pre-test hierarchical analysis questionnaire. Taking all dimensions as an example, "environmental protection" was rated three times more important than "customers and communities,"

highlighting its key role. Detailed information is shown in Table 11 This comparison method was also applied to all criteria under the other six dimensions.

Table 11: Each aspect matrix chart

Sample Average	D1	D2	D3	D4	D5	D6
D1	1.00	1.89	3.89	3.79	3.87	4.66
D2	1.71	1.00	3.88	3.26	3.81	4.59
D3	1.51	1.69	1.00	1.53	2.36	2.26
D4	2.12	2.15	2.25	1.00	2.35	3.16
D5	1.57	2.13	2.35	2.23	1.00	2.37
D6	1.45	1.87	1.34	1.48	1.81	1.00

The paired comparison matrix results show that environmental protection is the top priority for sustainable development. Enterprises should focus on carbon emission management, implementing reduction measures to minimize environmental impact. Proactive carbon reduction not only ensures compliance with global regulations but also strengthens the brand's green image and market trust. In an era where consumers care more about environmental issues, environmentally responsible brands are likely to gain market favor and long-term loyalty. For dimensions with lower weights, enterprises can adjust strategies and resources to maintain a balanced approach to sustainability.

5.3 Consistency Verification of Dimensions and Evaluation Criteria

This study consists of 6 components and 28 criteria. The collected questionnaire data were used for consistency verification, and the results of 7 C.I. value verification programs are presented, as shown in Table 12.

Table 12: Summary of C.I values

Item	C.I value
Dimensions	0.06
Environmental protection (D1)	0.06
Environmental innovation (D2)	0.02
Human resources (D3)	0.04
Customers and community (D4)	0.04
Supply chain social responsibility (D5)	0.03
Corporate governance (D6)	0.05

5.4 Holistic Analysis

This study applies the Analytic Hierarchy Process (AHP) to evaluate the key dimensions and criteria of corporate sustainable development. Through expert questionnaires and pairwise comparisons, pairwise comparison matrices were established, and the weights and rankings of each dimension and criterion were calculated. The weight distribution of evaluation criteria for option selection is shown in Table 13.

The results indicate that "Environmental Protection" and "Environmental Innovation" are the two most important dimensions, highlighting the high level of corporate concern for environmental issues in the context of sustainability. Among the specific criteria, "Circular Economy," "Industrial Relations," and "Marketing Integrity" rank as the top three, demonstrating the significance of innovation, employee relations, and ethical marketing in sustainable development.

Table 13: Weights of evaluation criteria

First level					
Dimensions			Weights		Ranking
Environmental protection (D1)			0.22		1
Environmental innovation (D2)			0.21		2
Human resources (D3)			0.13		5
Customers and community (D4)			0.16		3
Supply chain social responsibility (D5)			0.15		4
Corporate governance (D6)			0.12		6
First level	Second level				
Dimensions	Evaluation criteria	Weights	Relative Ranking	Global weights	Overall Ranking
D1	C11	0.17	4	0.04	19
	C12	0.13	6	0.03	24
	C13	0.17	3	0.04	18
	C14	0.21	1	0.05	14
	C15	0.18	2	0.04	17
	C16	0.14	5	0.03	22
D2	C21	0.31	2	0.06	5
	C22	0.30	3	0.06	7
	C23	0.39	1	0.08	1
D3	C31	0.32	1	0.04	2
	C32	0.18	3	0.02	16
	C33	0.14	5	0.02	23
	C34	0.20	2	0.03	15
	C35	0.16	4	0.02	21
D4	C41	0.04	5	0.01	28
	C42	0.11	4	0.02	27
	C43	0.29	2	0.05	8
	C44	0.32	1	0.05	3
	C45	0.24	3	0.04	12
C5	C51	0.11	4	0.02	26
	C52	0.30	2	0.05	6
	C53	0.27	3	0.04	9
	C54	0.31	1	0.05	4
D6	C61	0.26	1	0.03	10
	C62	0.22	3	0.03	13
	C63	0.24	2	0.03	11
	C64	0.16	4	0.02	20
	C65	0.11	5	0.01	25

6 Conclusion and Remarks

This study applied the Analytic Hierarchy Process (AHP) to assess key dimensions of corporate sustainability, revealing that "Environmental Protection" and "Environmental Innovation" are the most critical factors. The top-ranked criteria—"Circular Economy," "Labor Relations," and "Marketing Integrity"—underscore the importance of innovation, ethical business practices, and employee well-being in sustainable development. These findings highlight the need for

companies to integrate environmental strategies with responsible corporate practices to enhance long-term competitiveness and brand value. Future research could further explore the interplay between these factors and their impact on corporate performance.

Acknowledgement

This research was partially supported by the National Science and Technology Council of the Republic of China (Taiwan) under grant NSTC 114-PGFA-B-800-049. This support is gratefully appreciated.

References

[1] Niinimäki, K., Peters, G., Dahlbo, H., Perry, P., Rissanen, T., & Gwilt, A. (2020). The environmental price of fast fashion. Nature Reviews Earth & Environment, 1(4), 189-200.

[2] Cachon, G. P., & Swinney, R. (2011). The value of fast fashion: Quick response, enhanced design, and strategic consumer behavior. Management science, 57(4), 778-795.

[3] Synesgy (2024)。ESG Indicators: How to Evaluate Sustainability Performance. :https://www.synesgy.com/en/esg-guide/esg-indicators-how-to-evaluate-sustainability-performance/

[4] Parment, A. (2008). Distribution strategies for volume and premium brands in highly competitive consumer markets. Journal of Retailing and Consumer Services, 15(4), 250-265.

[5] Saaty, T. L. (1990). How to make a decision: the analytic hierarchy process. European journal of operational research, 48(1), 9-26.

[6] Wu, Wann-Yih, Business Research Methods, Fifth Edition, Hwa Tai Publishing, 2011.