

Information Asymmetry in Tourism Market: The Bilateral Effects of ESG Practices on Firm Profitability

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Abstract

The tangible impact of environmental, social, and governance (ESG) practices on firm profitability remains a subject of contention. Existing studies have tended to overlook the potential impact of information asymmetry within the tourism market, particularly in the communication of ESG practices between firms and consumers. This paper, utilizing panel data spanning from 2009 to 2022, employs a two-tier stochastic frontier model to delve into the relationship between ESG practices and firm profitability under information asymmetry. The findings show that the combined effect of ESG practices on firm profitability is adverse when considering information asymmetry between the firm and its consumers, which primarily facilitates the inhibitory facet. The inhibitory and promotional effects of ESG practices interplay here, resulting in the actual profitability level being lower than the benchmark level. Heterogeneity analysis underscores that the characteristics of state-owned enterprises serve to alleviate the inhibitory influence of ESG practices on the profitability of tourism firms.

Keywords

ESG practices, information asymmetry, bilateral effects, tourism firm performance, two-tier stochastic frontier model

Introduction

Information asymmetry manifests in the uneven flow of information between tourism firms and other stakeholders particularly between the firm and its consumers, which is also inevitable when talking about Environmental, Social, and Governance (ESG) practice topics (Lin et al., 2024a; Shen et al., 2023). A firm's ESG disclosures are crucial for shaping consumer trust perceptions (Park et al., 2014), which, in turn, significantly influence purchasing decisions. In the environmental domain, information about firm environmental initiatives, such as green office practices, environmental certifications, and other energy-saving activities (Wu et al., 2023), may not be fully perceived by tourism consumers. Similarly, in the realm of social responsibility, relevant activities like charitable donations and community engagement plans by businesses (Chen et al., 2022) may not be promptly captured by a wide range of consumer groups. Additionally, corporate governance structures often involve complex internal decision-making processes that may lack transparency for external tourist groups (Li & Singal, 2022). Conversely, firms may also obscure their actual ESG practices and instead, mislead consumers by engaging in

deceptive or exaggerated publicity of their social responsibility initiatives (Wu et al., 2020). Such “greenwashing” behavior (Todaro & Torelli, 2024) by businesses can misguide tourism consumers in their perception of firm reputation, leading to deviating from benchmarked consumption decisions (Majeed & Kim, 2023; Papagiannakis et al., 2024). Therefore, addressing the issue of information asymmetry in the ESG domain is crucial for both tourism firms and consumers, as it enhances corporate sustainability efforts while also significantly influencing consumers' subsequent consumption decisions.

It is generally believed that the issue of information asymmetry is notably pronounced in the tourism industry (Nicolau & Sellers, 2010). First, the tourism sector itself

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possesses information-intensive characteristics, encompassing a plethora of services, facilities, and destination details (Li & Wu, 2024). A firm's reputation for fulfilling ESG responsibilities typically influences consumer loyalty and subsequent purchasing decisions. However, inefficient signal transmission can hinder consumers from fully understanding the ESG performance of individual tourism firms. Second, as tourism firms operate in a fiercely competitive environment (Singal, 2015), they may be inclined to highlight their strengths through promotional efforts rather than openly disclosing detailed ESG information. Competitive pressures may lead firms to be selective in their information disclosure, focusing on aspects that can shape a positive image while selectively avoiding unfavorable information. Third, tourism consumption often involves discretionary spending (Poretti & Heo, 2022), as consumer decisions are often influenced by subjective factors, personal preferences, and immediate circumstances. In situations of information asymmetry, consumers may struggle to accurately assess the ESG risks and opportunities associated with tourism firms (Dogru et al., 2022), thereby being unable to fully consider sustainable and responsible factors when selecting tourism products or services.

While tourism firms prioritize the integration of ESG practices into their business operations to address the diverse needs of multiple stakeholders (Theodoulidis et al., 2017), debates persist regarding whether and to which extent a firm can gain advantages in firm profitability through the implementation of socially responsible initiatives (Hwang et al., 2024; Shin et al., 2024). This is primarily due to the fact that although tourism firms can experience “firm reputation” advantages such as enhanced brand reputation and the retention of qualified employees through ESG practices, there are concurrent “transaction cost” challenges, including substantial initial costs and the potential for managerial opportunism arising from information asymmetry between the insiders and outsiders of a firm (Song et al., 2024). Previous studies show that ESG practices within tourism firms may either contribute to enhancing firm value (Qiu et al., 2021) or have a negative impact on it (Lin et al., 2024b). Alternatively, there could exist a non-linear relationship (Kim et al., 2018; Zhou et al., 2022) between ESG practices and firm value or might be no significant linkage (Moneva et al., 2020). However, most ESG studies have predominantly focused on the financial aspects from an investment perspective (Back, 2024), overlooking the impact of information asymmetry in the communication of ESG practices between tourism firms and consumers. This potential impact may challenge current understanding of the connection between ESG practices and firm profitability. Therefore, this paper attempts to determine whether ESG practices

have a bidirectional effect on firm profitability and to what extent information asymmetry impacts the actual firm profitability level in the tourism market.

Different from traditional modeling of linear symmetry relationships between ESG practices and firm financial performance or profitability (Chen et al., 2023), this paper contends that the information asymmetry between tourism consumers and firms contributes to a bilateral impact, i.e., promotion effect and the inhibition effect. We first investigate the traditional linear symmetry relationships using a two-way fixed effects model, without accounting for potential information inefficiencies in the communication between firms and consumers. The results support the value enhancing effect of ESG practices on firm revenue. The findings are robust after carrying out a dynamic panel estimation. Next, the two-tier stochastic frontier analysis (SFA) model is adopted to measure the bilateral effects of ESG practices on firm profitability under information asymmetry. However, we find that the net effect of ESG practices on firm revenue is adverse, with the inhibitory facet exerting dominance. This indicates that information asymmetry has a potential impact on the ESG practice-firm profitability relationship. Moreover, heterogeneity analysis underscores that the characteristics of state-owned enterprises serve to alleviate the inhibitory influence of ESG practices on firm profitability. Finally, the robustness of these conclusions is verified through several methodological measures, including assumptions of a semi-normal distribution model, lagging dependent variables, decomposition of ESG practice components, and exclusion of samples from the COVID-19 pandemic period.

By scrutinizing the bilateral impact of ESG practices on tourism firm profitability, this paper significantly contributes to elucidating the existence and impact of information asymmetry between firms and consumers in the tourism market. Specifically, this paper reveals the possible impact of information asymmetry in “firm reputation” advantages and “transaction cost” challenges, thereby expanding the understanding of theories related to ESG practices in the context of information asymmetry. Furthermore, we pioneered the introduction of two-tier SFA model to decompose the promotion effect and the inhibition effect, and also measure the combined effect of ESG practices. Unlike linear symmetry logic, it contributes to deeply understand the deeper possibilities of the impact of ESG practices on firm profitability in the tourism market. Finally, by exploring the impact of firm property rights, annual time evolution, and business typology traits on information asymmetry between firms and consumers, we expand the boundaries of the linkage between ESG practices and firm revenue.

Literature Review and Hypothesis Development

Information Asymmetry in the Tourism Market

Information asymmetry occurs when parties in communication or transactions possess varying levels or types of information (Lin et al., 2023). This imbalance can lead to one party having more accurate information during decision-making, while the other may lack or misunderstand crucial information (Ye et al., 2023). In the realm of tourism studies, numerous endeavors have been undertaken in existing studies to delve into the issue of information asymmetry. Information asymmetry may constrain the capability of management in tourism firms to make well-informed strategic decisions (Lin et al., 2023). Previous studies explore the bargaining power and the influence of informational inefficiency on tourist shopping (Zhang et al., 2018) and assess the extent of information asymmetry by examining the lodging prices of international tourist hotels (Ye et al., 2023). Quality certification of chain hotels can serve as a valuable tool in reducing information asymmetry (Nicolau & Sellers, 2010). We believe that information asymmetry plays a crucial role in the decision-making process of ESG practices (Kim & Park, 2023). This imbalance of ESG information has a potential impact on consumer behavior, firm strategic decisions, and tourism market.

Information asymmetry poses challenges for consumers when evaluating a firm's ESG performance. Consumers may make consumption decisions relying on incomplete or misleading information, exposing themselves to unnecessary risks (Nicolau & Sellers, 2010). For tourism firms, information asymmetry can result in the underestimation or misunderstanding of their ESG efforts. Despite some firms making substantial investments and improvements in ESG, these initiatives might go unnoticed by the external world due to a lack of effective communication channels (Kim & Park, 2023). Moreover, information asymmetry can create an environment where certain firms exploit the lack of transparency (Wu et al., 2020) for what is often referred to as "green money laundering" (Kim & Lyon, 2015). This symbolic ESG communication strategy (Bothello et al., 2023) often involves exaggerating or falsely promoting their environmental and social performance to mislead consumers (Shen et al., 2023). Most importantly, information asymmetry can give rise to trust issues among participants in the tourism consumption market (Zhang et al., 2018). When consumers are uncertain about whether a firm genuinely adheres to ESG principles, it undermines trust in the firm and subsequently impacts the overall stability of the market.

Managing reputation risk is an intricate and dynamic process (Murè et al., 2021). It demands firms to address

internal risk factors and adapt to ongoing changes in the external environment (Wu et al., 2023). The tourism industry, being information and knowledge-intensive, is susceptible to media influence (Li & Wu, 2024). Intense competition and uncertainty (Singal, 2015) in this sector may impact reputation transmission due to overlooked factors like information overload or the spread of misinformation (Song et al., 2024). In the era of digitalization and social media, positive signals from ESG practices can get overshadowed by consumers' information overload (Li & Wu, 2024). Misinformation may be exaggerated and spread rapidly, leading to reputational effects of ESG practices deviating from benchmark levels.

Additionally, information asymmetry and uncertainty can influence transaction costs. Information asymmetry implies differing levels of information between transaction parties, potentially resulting in "moral hazard" and "adverse selection" issues (Kim & Park, 2023). The intangible nature of tourism experiences and services, along with the imperceptibility of service products and the simultaneous production and consumption, often results in a delay in consumers' subjective feelings and evaluations (Nicolau & Sellers, 2010). This exacerbates the information asymmetry between consumers and tourism firms. Uncertainty denotes the unpredictability of the future environment, potentially raising transaction costs for consumers seeking and choosing travel products and services. Influenced by consumer income and available free time, tourism consumption is non-disposable, further intensifying uncertainty in tourism consumption demand (Poretti & Heo, 2022).

ESG Practices and Tourism Firm Profitability

The connection between ESG practices and firm profitability remains contentious (Aguinis et al., 2024; Narula et al., 2025), with scholars investigating this relationship through various methodological perspectives (Legendre et al., 2024). The qualitative comparative analysis offers fresh insights into understanding the intricate relationship between ESG practices and firm value. This method, characterized by equivalence, concurrent causality, and asymmetric causality, has the advantage of avoiding omitted variable bias (Geremew et al., 2024). It aids in exploring the diverse paths of multi-dimensional determinates of ESG practices to enhance the value of tourism firms. The necessary condition analysis aids in identifying the necessity and bottleneck level (Lee & Lu, 2025) in the impact of multi-dimensional determinates of ESG practices on firm value. Its effect size remains unaffected by the presence or absence of unknown variables, making it particularly suitable for exploratory research involving small sample cases. Existing configurational analysis research indicates that a single dimension of ESG practices is insufficient to generate high levels of firm value.

Instead, the integration of product quality, CSR communication, and environmental protection is crucial for achieving superior firm performance (Wu et al., 2023). Traditional regression analysis typically assumes a linear and symmetric relationship between two variables, restricting the examination of their impact on organizational outcomes to competing antecedent variables and their net effects (Geremew et al., 2024). In prior studies, regression analysis was employed to assess the influence of multi-dimensional determinates of socially responsible practices and tourism firm profitability (Wu et al., 2024).

Despite methodological variations, prevailing research generally posits a dual impact of ESG practices on firm financial performance (Lee et al., 2023; Lin et al., 2024b). ESG practices may positively influence firm profitability, with reputation serving as a crucial facet of a business's intangible assets. In the ESG context, a firm's reputation is directly shaped by the quality of its environmental protection measures, social responsibility actions, and governance structure. According to reputation transaction theory (Preston & O'bannon, 1997), reputation acts as a medium of interaction between firms and stakeholders, examining how firm reputation is established through behaviors in environmental, social, and governance aspects. ESG practices significantly influence consumers' purchasing decisions (Murè et al., 2021). A positive reputation decreases transaction costs by minimizing consumer uncertainty about a firm's actions. Likewise, consumers prefer products or services from firms with superior environmental and social performance, viewing it as an indicator of long-term stability and sustainable growth (Zhou et al., 2022). Hence, ESG practices fostering a positive reputation not only attract more consumers but also enhance customer loyalty. Ultimately, this positions the firm advantageously in a fiercely competitive market, leading to improved profitability. We propose the following competitive hypothesis:

H1a: ESG practices are positively associated with the profitability of tourism firms.

ESG practices might adversely affect firm profitability. ESG research centers on firms' environmental impact, social responsibilities, and the efficiency and fairness of their internal governance structures in business activities. Contract cost theory (Cornell & Shapiro, 1987) delves into how firms can optimally organize transactions and manage relationships amid incomplete contracts and bounded rationality. It significantly contributes to the ESG practice domain by uncovering the impact of transaction costs on firm decision-making (Johnsen, 2009). Firms addressing environmental issues must account for transaction costs and innovation costs associated with environmental protection. Firms also evaluate the costs and benefits of social responsibility activities, viewing

them as investment endeavors to alleviate resource consumption (Wu et al., 2024). Moreover, robust governance structures are foundational for attaining environmental and social objectives (Koh, 2024). Yet, the information asymmetry between internal and external stakeholders gives rise to monitoring costs for consumers and agency costs for managers (Zhou et al., 2022). These costs significantly shape a firm's ESG practices, potentially resulting in reduced firm profitability. We propose another competitive hypothesis:

H1b: ESG practices are negatively associated with the profitability of tourism firms.

While in theory, ESG practices are believed to have a dual impact on firm profitability, most regression analysis-based studies tend to yield specific conclusions, indicating either a positive or negative correlation. As a result, existing research tends to isolate the overall impact of ESG practices on firm profitability, lacking a quantitative estimation of the comprehensive impact of both factors. Most importantly, the impact of information asymmetry in the process of ESG practices communications between tourism consumers and firms has been neglected. Implementing ESG initiatives can help cultivate a positive corporate image, and effective communication of social responsibility signals enhances consumer trust and loyalty (Wu et al., 2024). These factors, in turn, influence consumers' purchasing and consumption behaviors, ultimately impacting tourism firm's profitability. Therefore, measuring information asymmetry in the tourism market and understanding its potential impact on the connection between ESG practices and firm revenue is crucial. Given the presence of information asymmetry, this paper hypothesizes a potential interplay between the positive and negative impacts of ESG practices on firm financial performance, expressed as promotional effects, inhibitory effects, and combined effects as equilibrium outcomes. The bilateral stochastic frontier aids in analyzing the reciprocal mechanism through which ESG practices influence firm profitability. We propose the following hypothesis:

H2: ESG practices have a bilateral effect (i.e., both positive and negative impacts) on tourism firm profitability.

Methodology

Data and Samples

This paper uses publicly traded tourism firms listed in Shanghai and Shenzhen A-share stock market as the sample, which returns 56 firms over the 2009 to 2022 period. Tourism firms typically have diversified business

operations (Hu et al., 2020), spanning attractions, restaurants, hotels, travel agencies, airlines, live entertainment, among others (Wu et al., 2024). This paper extends the standard industry classification by including firms from other sectors whose primary operations or core activities are closely tied to tourism (Liu et al., 2024). ESG practices data is retrieved from the Sino-Securities Index (chindices.com) and the Wind database (Lin et al., 2024b). Firm-specific financial data derives from the CSMAR (gtarsc.com) and CNRDS (cnrds.com) databases (Wu et al., 2023).

The data cleaning process adheres to the following principles: First, only firms with at least three consecutive firm-year observations during the study period are included. Second, we exclude firms with poor financial conditions, which presents as a stamp of “special treat” in a fiscal year. Third, different sources of data are merged, and the missing value of variables is deleted. Fourth, the winsorized measure at the 1% and 99% levels is adopted to mitigate the influence of extreme outliers. After data cleaning, the final sample consists of unbalanced dataset of 661 firm-year observations.

Main Variables

The dependent variable, firm profitability, is proxied by return on assets (*ROA*), which serves as an accounting-based measure and offers insights into the revenue brought by consumers. It assesses a firm’s ability of business operations for firm’s product sale and service delivery and can be calculated by the net profit generated per unit of assets (Wu et al., 2024). ESG practices in the logarithmic form serve as the independent variable, which including the global ESG ratings (*lnesg*), environmental responsibility (*lnesg_score*), social responsibility (*lns_score*), and governance responsibility (*lng_score*) (Lin et al., 2024b). The raw values of ESG practices range from 1 to 100, with higher values indicating higher performance.

Several firm-specific variables are controlled to alleviate the potential confounding effects (Ozdemir et al., 2023; Xie et al., 2019). *Firm size* is calculated by the natural logarithm of total assets. Larger firms can exploit economies of scale, which may benefit firm revenue. *Firm age* is proxied by the natural logarithm of the number of years since its establishment. The logarithmic transformation of *Tobin’s Q* is adopted to proxy market value. *Financial leverage* is indicated by the ratio of long-term debt to total assets. The capital and consumer market will perceive high debt as a financial risk, which may reduce firm earnings. *Asset tangibility* denotes the ratio of fixed assets to total assets. *Cash-to-assets ratio* is proxied by the ratio of cash and cash equivalents to total assets. Discretionary cash provides the possibility for strategic investments, and thus can be beneficial to firm

performance. Property rights (*SOE*) is a binary variable taking a value of 1 if the firm is state-owned and 0 otherwise. State-owned corporates are more likely to accord with philanthropy expectations from consumers, thus could benefit firm profitability.

Model Specification

Theoretical Analytical Framework. We construct a theoretical analytical framework to illustrate the net effects (or average impacts) and the bilateral effects of ESG practices on tourism firm profitability, respectively. Ordinary least squares (OLS) and fixed effects model estimate the net effects of focus variables, but this estimation can hardly capture the influence of information asymmetry. Bilateral effects analysis can consider the influence of information inefficiency in the process of firm-consumer transactions on firm profitability.

The fixed effects model for the impact of ESG practices on firm revenue can be expressed as:

$$\begin{aligned} ROA_{it} = & \alpha_0 + \beta_0 ESG_{it} + \beta_1 Firm_size_{it} + \beta_2 Firm_age_{it} \\ & + \beta_3 Tobins'Q_{it} + \beta_4 Leverage_{it} + \beta_5 Tangibility_{it} \\ & + \beta_6 Cash_ratio_{it} + \beta_7 SOE_{it} + Firm + Year + \varepsilon_{it} \end{aligned} \quad (1)$$

where α is the constant term and ε_{it} is the random error term. *Firm* and *Year* are used to control the individual *i* and time *t* characteristics, respectively. We also estimate a dynamic panel regression estimation with the system generalized method of moments (GMM) by introducing the first and second order lag terms of the dependent variable.

$$\begin{aligned} ROA_{it} = & \alpha_0 + \alpha_1 ROA_{it-1} + \alpha_2 ROA_{it-2} + \beta_0 ESG_{it} \\ & + \beta_1 Firm_size_{it} + \beta_2 Firm_age_{it} + \beta_3 Tobins'Q_{it} \\ & + \beta_4 Leverage_{it} + \beta_5 Tangibility_{it} + \beta_6 Cash_ratio_{it} \\ & + \beta_7 SOE_{it} + Firm + Year + \varepsilon_{it} \end{aligned} \quad (2)$$

The theoretical framework of two-tier SFA can be explained as follows:

$$ROA = \underline{ROA} + \Psi(\overline{ROA} - \underline{ROA}), 0 \leq \Psi \leq 1 \quad (3)$$

where the values of *ROA* ranges from the lower limit \underline{ROA} to the upper limit \overline{ROA} restricted by the influence of ESG practices. Theoretically, ESG practices exert bilateral effects on firm profitability due to informational inefficiencies of firm-consumer both sides. When $\Psi = 1$ ($\Psi = 0$), ESG practices exert only the promotion effect (inhibition effect), which indicates that *ROA* will attain the upper limit $ROA = \overline{ROA}$ (lower limit $ROA = \underline{ROA}$).

We can reformulate equation (3) as follows to enhance the clarity of the illustration.

$$ROA = \mu(x) + \Psi(\overline{ROA} - \mu(x)) - (1 - \Psi)(\mu(x) - \overline{ROA}) \quad (4)$$

where $\mu(x)$ denotes the baseline firm profitability level without considering the impact of ESG practices. The promotion effect and inhibition effect can be represented by $\Psi(\overline{ROA} - \mu(x))$ and $(1 - \Psi)(\mu(x) - \overline{ROA})$. Accordingly, the combined effect can be expressed as $ROA - \mu(x)$.

Two-tier Stochastic Frontier Analysis. The classic two-component structure SFA model, serving as a parameter frontier analysis method, has found extensive application in the examination of tourism economic activities. These activities encompass various facets such as product production and cost, firm revenue, and profitability (Assaf & Josiassen, 2016). In a two-tier SFA model, the composite error term undergoes decomposition into a three-component error structure (Ma et al., 2024). This structure includes two one-sided inefficiency terms alongside a zero-mean symmetric stochastic disturbance (Kumbhakar & Parmeter, 2009). Moreover, within the two-tier SFA model, the nonnegative and negative error terms form the inefficiency components. These components are commonly utilized to gauge the impact of informational inefficiencies (Zhang et al., 2018). For instance, incomplete and imperfect information regarding ESG practices affects the profits derived from realized transactions on both the firm and consumer.

The primary purpose of the two-tier SFA model is to discern the impact of information inefficiencies on transaction prices between two parties (Wang & Xia, 2022), that is tourism firms and consumers. It proves particularly adept at evaluating the asymmetries prevalent in tourism markets, where economic agents, such as tourism consumers and firms, operate in opposing directions. This assessment hinges entirely on the outcomes of model estimation, relieving researchers from the necessity of forecasting the relative strength of both promotional and inhibitory effects, and ultimately their combined impact (Song & Han, 2022). Building upon the foundational research of Kumbhakar and Parmeter (2009), we present the two-tier SFA model as follows:

$$\begin{aligned} ROA_{it} = & \alpha_0 + \beta_1 Firm_size_{it} + \beta_2 Firm_age_{it} \\ & + \beta_3 Tobins'Q_{it} + \beta_4 Leverage_{it} + \beta_5 Tangibility_{it} \\ & + \beta_6 Cash_ratio_{it} + \beta_7 SOE_{it} + Firm + Year \\ & + w_{it} - u_{it} + \varepsilon_{it} \end{aligned} \quad (5)$$

where $\xi_{it} = w_{it} - u_{it} + \varepsilon_{it}$ is the three-component error structure, which represents the combined effect that ESG

practices exerts on firm profitability. We assume that w_{it} and u_{it} follow the exponential distribution and ε_{it} follows a normal distribution. $w_{it} \geq 0$ and $u_{it} \leq 0$ are calculated to describe the promotion effect and inhibition effect of ESG practices on firm profitability, respectively. When $w_{it} = 0$ ($u_{it} = 0$), ESG practices exert only the inhibition effect (promotion effect). When $w_{it} = u_{it} = 0$, the two-tier SFA model is equal to OLS model. Since the composite residual term ξ_{it} may not be equal to 0, this will result in biased estimates from the OLS model (Wang & Chen, 2023).

According to the recently developed instrumental descriptions (Lian et al., 2023), we can derive the probability density function of ε_{it} , that is $f(\varepsilon_{it})$. Estimates can be obtained by maximizing the log-likelihood function, that is the maximum likelihood estimate method. As for the measurement of one-sided terms in levels, we can calculate the conditional distributions of w_i and u_i as $f(w_i|\varepsilon_i)$ and $f(u_i|\varepsilon_i)$. The observation-specific conditional expectations can be represented as $E(w_i|\varepsilon_i)$ and $E(u_i|\varepsilon_i)$. Accordingly, we can derive the conditional expectations to obtain the logarithmic one-sided terms, that is $E(e^{-w_i}|\varepsilon_i)$, $E(e^{-u_i}|\varepsilon_i)$, and $E(e^{w_i}e^{-u_i}|\varepsilon_i)$.

The size of bilateral effects is estimates by the economic decomposition model, which presents the advantages of accuracy and objectivity. The combined effect of ESG practices on firm profitability can be calculated by $E(w_i|\varepsilon_i) - E(u_i|\varepsilon_i)$ for the exponential specification and $E(e^{-w_i}|\varepsilon_i) - E(e^{-u_i}|\varepsilon_i)$ for the half-normal specification (Papadopoulos, 2015). The combined effect can be used to measure the degree of deviation of actual firm profitability from the benchmark.

Empirical Results and Analysis

Descriptive Statistics

Table 1 shows descriptive statistics and correlation analysis. *ROA* has a mean value of 0.017 with a standard deviation of 0.089. Overall ESG practices have a mean value of 4.280 with a standard deviation of 0.079. The results of binary covariate analysis show that ESG practices are positively related to firm profitability ($r = 0.377$, $p < .01$), which demonstrates the value enhancing effect of ESG practices. When considering the decomposed components of ESG practices, it is found that adopting social initiatives ($r = 0.117$, $p < .01$) and governance initiatives ($r = 0.405$, $p < .01$) can benefit firm performance, whereas environmental responsibility ($r = -0.024$, $p > .1$) does not exhibit a significant impact. Furthermore, firm size, fixed assets ratio, cash ratio, and property ownership are positively correlated with firm profitability, while firm age, market value, and financial leverage show negative correlations with firm profitability.

Table 1. Descriptive Statistics and Correlation Analysis.

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1 ROA	0.017	0.089											
2 <i>lnesg</i>	4.280	0.079	0.377***										
3 <i>ln_score</i>	4.013	0.137	−0.024	0.342***									
4 <i>lns_score</i>	4.280	0.157	0.117***	0.585***	0.036								
5 <i>lng_score</i>	4.371	0.122	0.405***	0.706***	−0.013	−0.011							
6 <i>Firm_size</i>	22.335	1.745	0.086**	0.332***	0.549***	0.054	0.110***						
7 <i>Firm_age</i>	2.904	0.380	−0.292***	−0.134***	0.052	0.060	−0.284***	0.006					
8 <i>Tobin's Q</i>	1.097	0.411	−0.133***	−0.251***	−0.271***	−0.078**	−0.093***	−0.558***	−0.010				
9 <i>Leverage</i>	0.456	0.240	−0.383***	−0.148***	0.286***	0.030	−0.384***	0.444***	0.206***	−0.147***			
10 <i>Tangibility</i>	0.260	0.198	0.075*	0.105***	−0.041	−0.097**	0.203***	0.010	0.020	−0.128***	0.060		
11 <i>Cash_ratio</i>	0.987	1.512	0.201***	0.129***	−0.101***	−0.049	0.269***	−0.219***	−0.235***	0.104***	−0.580***	−0.109***	
12 <i>SOE</i>	0.564	0.496	0.123***	0.185***	−0.025	0.080**	0.200***	0.107***	0.092**	−0.181***	0.008	0.453***	−0.049

Note. *lnesg*, *ln_score*, *lns_score*, and *lng_score* represent the logarithm of the global ESG practices, environmental responsibility, social responsibility, and governance responsibility, respectively.

* $p < .1$. ** $p < .05$. *** $p < .01$.

Fixed Effects and Dynamic Panel Estimations

Table 2 presents the estimation results utilizing fixed effects and dynamic panel models. Specifications (1) and (2) assess the effects of ESG practices on tourism firm profitability using OLS and fixed effects methodologies. To compare the models' goodness of fit, we employ the Akaike information criterion (AIC) and the Bayes information criterion (BIC) (Zhang et al., 2018). Notably, specification (2), which further incorporates individual and time effects controls, yields lower AIC and BIC values compared to specification (1).

In specification (3), dynamic panel regression estimation employing the system GMM method (Chen et al., 2022; Taddeo et al., 2024) is conducted to address unobserved endogeneity, simultaneity, and dynamic endogeneity by incorporating lagged values and employing internal transformation processes (Ullah et al., 2018). The absence of autocorrelation in second-differenced errors, as indicated by the test of autocorrelation (AR), and the validity of instrument or model specifications, supported by the Hansen test, bolster the robustness of the results.

The estimation results of specifications (1–3) endorse the value-enhancing effect of ESG practices on firm financial performance, which supports H1a while rejecting H1b. Specifications (4–6) delve into the impact of disaggregated dimensions of ESG practices, that is environmental responsibility, social responsibility, and governance responsibility, on firm profitability. The findings suggest that social responsibility and governance responsibility positively correlate with tourism firm revenue, while environmental responsibility shows no significant contribution.

Two-tier Stochastic Frontier Estimation

Table 3 displays the estimation results using various two-tier SFA specifications. In specifications (1–3), individual and time dummy variables are successively incorporated into the estimation. Specifications (4) and (5) isolate the promotion and inhibition effects of ESG practices on firm profitability, respectively, while specification (6) considers both effects simultaneously. Evaluating the goodness of fit across different model specifications, we select specification (6) as the most suitable choice, evidenced by its lowest AIC (−2319.927) and BIC (−1960.427) values among the specified models. The parameter estimates reveal significant effects of firm size, market value, financial leverage, cash ratio, and property ownership on firm financial performance.

Decomposition of the Bilateral Effects

Variance analysis of v_i , w_i , and u_i can be adopted to explore the impact of information asymmetry of ESG

Table 2. Estimation Results Using Fixed Effects and Dynamic Panel Models.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
<i>lnesg</i>	0.245*** (0.042)	0.172*** (0.051)	0.833** (0.404)			
<i>ROA_lag1</i>			−0.804*** (0.182)			
<i>ROA_lag2</i>			−0.785*** (0.207)			
<i>lne_score</i>				−0.008 (0.036)		
<i>lns_score</i>					0.053** (0.026)	
<i>lng_score</i>						0.094*** (0.034)
<i>Firm_size</i>	0.009*** (0.002)	0.015* (0.008)	0.071* (0.042)	0.019** (0.008)	0.019** (0.008)	0.015** (0.008)
<i>Firm_age</i>	−0.047*** (0.008)	0.015 (0.038)	−0.404** (0.163)	0.005 (0.038)	0.006 (0.038)	0.013 (0.038)
<i>Tobin's Q</i>	−0.005 (0.009)	0.011 (0.013)	0.049 (0.086)	0.012 (0.013)	0.014 (0.013)	0.007 (0.013)
<i>Leverage</i>	−0.164*** (0.017)	−0.216*** (0.024)	−0.675*** (0.247)	−0.234*** (0.023)	−0.232*** (0.023)	−0.215*** (0.024)
<i>Tangibility</i>	0.019 (0.017)	−0.015 (0.029)	0.283 (0.361)	−0.010 (0.029)	−0.013 (0.029)	−0.010 (0.029)
<i>Cash_ratio</i>	−0.005** (0.002)	−0.001 (0.002)	0.092 (0.071)	−0.001 (0.003)	−0.001 (0.003)	−0.001 (0.003)
<i>SOE</i>	0.011 (0.007)	0.069*** (0.017)	−0.059 (0.169)	0.068*** (0.017)	0.068*** (0.017)	0.069*** (0.017)
<i>Firm dummy</i>	No	Yes	No	Yes	Yes	Yes
<i>Year dummy</i>	No	Yes	No	Yes	Yes	Yes
<i>Constant</i>	−1.021 (0.175)	−1.005*** (0.269)	−3.778* (1.890)	−0.302 (0.223)	−0.551*** (0.209)	−0.685*** (0.220)
<i>Observation</i>	661	661	541	661	661	661
<i>R-square / Hansen test</i>	0.321	0.310	0.135	0.304	0.311	0.299
<i>AIC / AR(1)</i>	−1559.327	−1635.170	0.019	−1622.126	−1627.276	−1631.201
<i>BIC / AR(2)</i>	−1518.883	−1289.151	0.865	−1276.607	−1281.257	−1285.182

Note. Standard errors are presented in parentheses.

* $p < .1$. ** $p < .05$. *** $p < .01$.

practices between firm and consumer in the unexplained variation in firm profitability. In Table 4, the results of variance decomposition, based on specification (6) of the two-tier SFA model, are presented. It is evident that the promotion ($\sigma_w = 1.16\%$) and inhibition ($\sigma_u = 5\%$) effects of ESG practices interact, leading to the actual profitability level of tourism firms ($\sigma_w - \sigma_u = -3.84\%$) falling below the benchmark profitability level of 3.84%. The result supports H2 and verifies the bidirectional effect of ESG practices on tourism firm profitability. Notably, the parameter σ_u surpasses σ_w , indicating that, on average, consumers experience a more pronounced information asymmetry regarding ESG practices compared to firms in the tourism consumption market. This suggests that the ultimate level of profitability hinges on the transparency of information about ESG practices between consumers and firms rather than solely on one party. This finding underscores the critical role played by both firm ESG

signal transmission and consumer ESG signal perception in influencing the firm profitability level.

We observe that the unexplained variation in firm revenue, represented by the proportion of total variance unexplained by the frontier profitability level $\sigma_v^2 + \sigma_w^2 + \sigma_u^2$, amounts to 0.0026. Notably, within this unexplained variation, $\sigma_w^2 + \sigma_u^2$ accounts for 100%, signifying that the promotion and inhibition effects of ESG practices elucidate all the total variance of firm profitability. This underscores the influential role of information asymmetry regarding ESG practices within the firm-consumer relationship. Specifically, the proportion of the inhibition effect encompasses 94.87% of this unexplained variation, leaving a mere 5.13% for the promotion effect. Consequently, the variance decomposition results indicate that the adverse impact of ESG information asymmetry on tourism firms outweighs the positive impact of ESG practices. The dominance of the inhibition effect in ESG

Table 3. Estimation Results Using Different Two-tier SFA Specifications.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
<i>Firm_size</i>	−0.005*** (0.000)	0.008*** (0.000)	−0.005*** (0.000)	−0.003*** (0.000)	−0.006*** (0.000)	−0.002*** (0.000)
<i>Firm_age</i>	−0.063*** (0.003)	−0.021*** (0.000)	−0.021*** (0.001)	−0.012*** (0.002)	0.002** (0.001)	−0.004 (0.002)
<i>Tobin's Q</i>	0.023*** (0.002)	0.033*** (0.000)	0.026*** (0.000)	0.022*** (0.001)	0.030*** (0.002)	0.026*** (0.001)
<i>Leverage</i>	−0.076*** (0.006)	−0.102*** (0.000)	−0.067*** (0.006)	−0.082*** (0.003)	−0.059*** (0.002)	−0.079*** (0.007)
<i>Tangibility</i>	−0.040* (0.022)	−0.002*** (0.000)	−0.028*** (0.003)	−0.011*** (0.004)	−0.000 (0.001)	0.005 (0.006)
<i>Cash_ratio</i>	0.000 (0.001)	−0.000*** (0.000)	0.001*** (0.000)	−0.001* (0.000)	−0.001** (0.000)	−0.002*** (0.000)
<i>SOE</i>	0.008*** (0.002)	0.001*** (0.000)	0.005*** (0.001)	0.013*** (0.002)	0.009*** (0.002)	0.019*** (0.002)
Firm dummy	Yes	No	Yes	Yes	Yes	Yes
Year dummy	No	Yes	Yes	Yes	Yes	Yes
Constant	0.424*** (0.008)	−0.066*** (0.001)	0.294*** (0.006)	0.216*** (0.006)	0.219*** (0.008)	0.152*** (0.003)
Random error term						
<i>ln_sigma_v</i>						
Constant	−9.749*** (2.610)	−34.647 (4190.648)	−12.221 (7.675)	−12.336 (8.635)	−13.567 (13.869)	−11.280** (5.072)
Promotion effect of ESG practices						
<i>ln_sigma_w</i>						
<i>lnesg</i>				−3.485*** (0.986)		−5.296*** (0.948)
Constant	−4.812*** (0.092)	−3.768*** (0.057)	−4.903*** (0.084)	10.136** (4.205)	−4.721*** (0.074)	18.114*** (4.059)
Inhibition effect of ESG practices						
<i>ln_sigma_u</i>						
<i>lnesg</i>					−4.687*** (0.477)	−5.016*** (0.497)
Constant	−2.855*** (0.041)	−2.963*** (0.043)	−2.922*** (0.040)	−2.949*** (0.041)	17.013*** (2.041)	18.384*** (2.127)
Observation	661	661	661	661	661	661
Log likelihood	1138.671	1053.506	1185.014	1187.112	1234.203	1239.964
AIC	−2149.341	−2059.011	−2218.027	−2224.224	−2308.406	−2319.927
BIC	−1861.741	−1951.161	−1876.502	−1887.192	−1948.906	−1960.427

Note. Standard errors are presented in parentheses.

* $p < .1$. ** $p < .05$. *** $p < .01$.

Table 4. Variance Decomposition of Bilateral Effects.

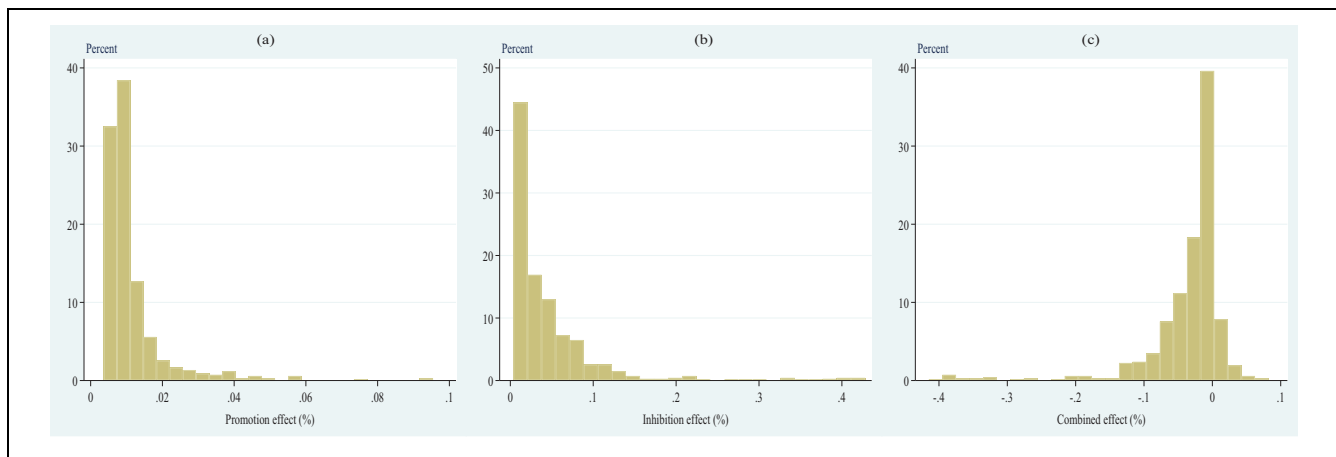
Variance decomposition	Definition	Formula	Value
Bilateral effects of ESG practices	Random error	σ_v	0.0000
	Promotion effect	σ_w	0.0116
	Inhibition effect	σ_u	0.0500
	Combined effect	$\sigma_w - \sigma_u$	−0.0384
Variance decomposition	Total variance of random error	$\sigma_v^2 + \sigma_w^2 + \sigma_u^2$	0.0026
	The proportion of bilateral effect	$\sigma_w^2 / (\sigma_v^2 + \sigma_w^2 + \sigma_u^2)$	1.0000
	The proportion of promotion effect	$\sigma_w^2 / (\sigma_v^2 + \sigma_w^2 + \sigma_u^2)$	0.0513
	The proportion of inhibition effect	$\sigma_u^2 / (\sigma_v^2 + \sigma_w^2 + \sigma_u^2)$	0.9487

practices leads to a relative negative deviation of actual firm profitability from the benchmark level.

Table 5 provides insights into the proportion and quantile distribution of the promotion, inhibition, and

Table 5. The Proportion and Quantile Distribution of the Effects.

Variables	Definition	Mean	SD	Min	Max	Q1	Q2	Q3
The exponential specification								
$E(w_i \varepsilon_i)$	Conditional expectation of w_i	0.012	0.010	0.004	0.100	0.007	0.009	0.012
$E(u_i \varepsilon_i)$	Conditional expectation of u_i	0.051	0.078	0.004	0.559	0.011	0.026	0.058
$E(w_i \varepsilon_i) - E(u_i \varepsilon_i)$	Net surplus in the level form	-0.039	0.077	-0.545	0.087	-0.049	-0.017	-0.000
The half-normal specification								
$E(e^{-w_i} \varepsilon_i)$	Conditional expectation of e^{-w_i}	0.011	0.010	0.004	0.095	0.007	0.009	0.012
$E(e^{-u_i} \varepsilon_i)$	Conditional expectation of e^{-u_i}	0.047	0.064	0.004	0.428	0.011	0.026	0.056
$E(e^{-w_i} \varepsilon_i) - E(e^{-u_i} \varepsilon_i)$	Net surplus in the logarithmic form	-0.035	0.064	-0.415	0.082	-0.048	-0.016	-0.000
$E(e^{w_i}e^{-u_i} \varepsilon_i) - 1$	Net effect in the logarithmic form	-0.036	0.065	-0.420	0.091	-0.048	-0.017	-0.000

**Figure 1.** The distribution of the (a) promotion, (b) inhibition, and (c) combined effects.

combined effects. Specifically, under the exponential specification, the promotion effect of ESG practices is estimated to enhance firm profitability by 1.2%, while the inhibition effect is projected to decrease firm profitability by 5.1%. Consequently, the combined effect of their interaction results in the actual firm profitability falling below 3.9% of the benchmark firm profitability level. Put differently, considering the simultaneous impact of promotion and inhibition effects of ESG practices, if the benchmark firm profitability is assumed to be 100%, the actual firm profitability would be 96.1%.

In the Quantile distribution analysis, the combined effect of ESG practices on tourism firm profitability manifests as negative, resulting in the average financial performance being lower than the frontier level by 4.9% in the first quartile (Q1), 1.7% in the second quartile (Q2), and 0% in the third quartile (Q3). This disparity may stem from consumers, as external stakeholders, encountering an information gap when accessing and interpreting ESG initiatives. Such information asymmetry could lead to insufficient feedback from consumers on ESG practices, consequently impacting firm profitability negatively. The findings also highlight significant disparities in the distribution of promotion, inhibition, and combined effects of

ESG practices. Firms, as the implementers of ESG practices, exhibit varying degrees of commitment to such initiatives. Additionally, differences in the fundamentals of firms contribute to the variability in the bilateral effects of ESG practices.

Figure 1 illustrates the distribution of the promotion, inhibition, and combined effects. Both the promotion and inhibition effects exhibit left-skewed distributions characterized by a right-trailing pattern. Specifically, in Figure 1(a) and (b), the promotion effect of ESG practices on firm profitability diminishes at 0.1%, while the inhibition effect continues to trail off at 0.4%. Figure 1(c) reveals that the majority of firms are clustered on the left side, indicating that the combined effect of ESG practices is notably less than 0 for most firms.

Characteristic Analysis and Heterogeneity

Figure 2 illustrates the promotion effect, inhibition effect, and combined effect across different years. The promotion effect ranges from 0.9% to 1.6%, while the inhibition effect varies between 2.7% and 8.7%. Notably, the inhibition effect consistently outweighs the promotion effect over the years, particularly evident during 2019 to 2022.

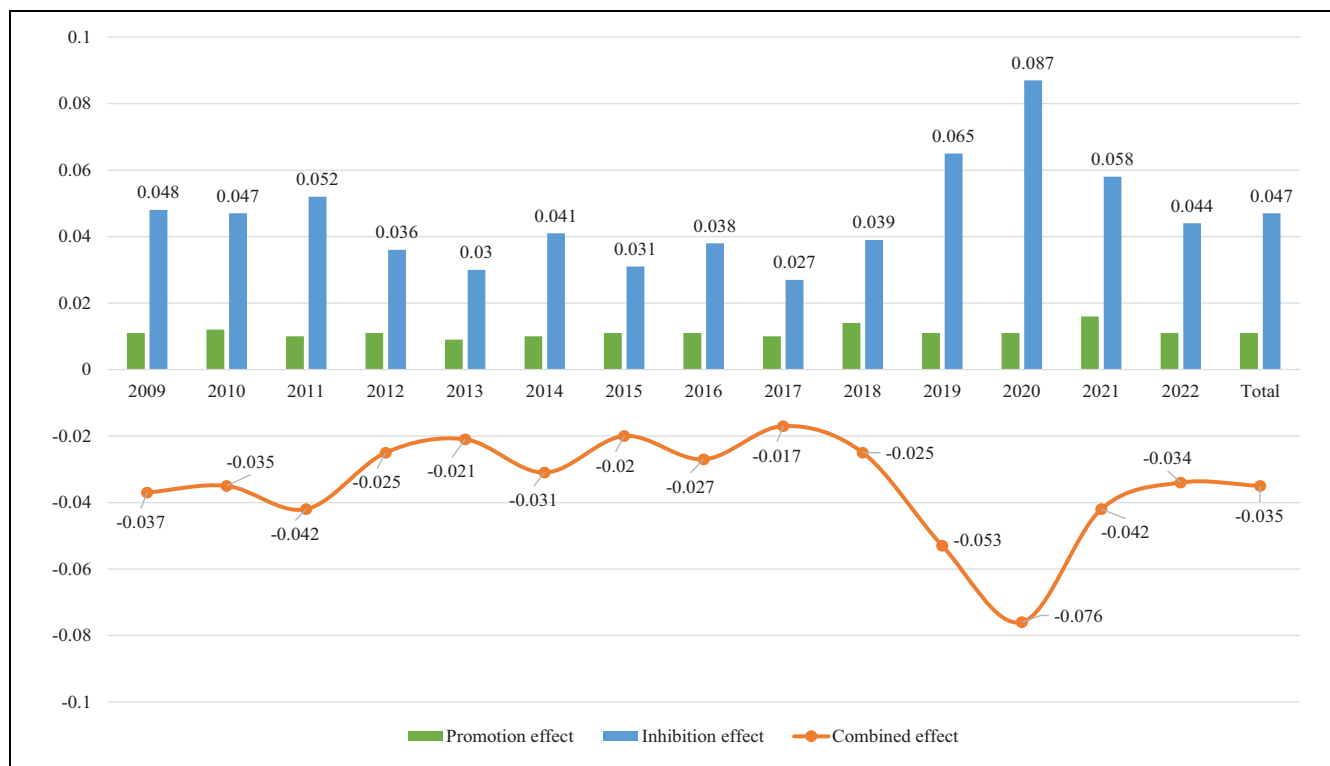


Figure 2. Time variation characteristics of the bilateral effects.

The combined effect, indicating the extent to which ESG practices ultimately impact firm profitability below the benchmark level, ranges from 1.7% to 7.6%, with an average of 3.5%. Intriguingly, the inhibition effect of ESG practices on firm profitability appears to be more pronounced during the COVID-19 pandemic. This could be attributed to the increased financial strain on firms investing in ESG initiatives during a public crisis. Consequently, the signal that firms engage in ESG practices may not receive positive feedback from consumers. This heightened information asymmetry between firms and consumers ultimately drives the actual firm value below the benchmark level.

Table 6 delineates the characteristics of business types regarding bilateral effects. We categorize tourism firms into six distinct business types to explore potential heterogeneity. Notably, the combined effect values for the accommodation and catering, travel agency and exhibition, and live entertainment sectors are below the average level. This indicates a more pronounced negative impact of informational inefficiency within these business types. Conversely, the combined effect values for the airline service, scenic spot and sightseeing, and tourism-related real estate sectors surpass the average level, suggesting a comparatively moderate negative deviation from the benchmark profitability level for these types of businesses. These findings underscore that varying degrees of damage to firm financial performance arise from asymmetric

information about ESG practices between firms and consumers across different business types.

We also delve into the variances in bilateral effect estimations based on property ownership, as outlined in Table 7. Interestingly, the magnitude of the promotion effect observed in state-owned and non-state-owned enterprises is comparable, suggesting a uniform transmission of ESG practice signals across different firm types. However, there is significant variability in the size of the inhibition effect across diverse firm types, resulting in a negative combined effect and thus deviating unfavorably from the benchmark profitability level. Notably, the combined effect observed in state-owned enterprises is nearly half that of non-state-owned enterprises. This discovery implies that consumers exhibit a more favorable response to ESG practice signals emanating from state-owned enterprises, and the level of information asymmetry is comparatively more moderate than that of non-state-owned enterprises.

Robustness Checks

The robustness of our findings is scrutinized through various methodological approaches, encompassing the lagging of dependent variables, exclusion of samples from the epidemic period, decomposition of ESG practice components, and assumptions of a half-normal distribution model. Table 8 delineates the outcomes of these robustness

Table 6. Business Type Characteristics of the Bilateral Effects.

Business type	Effects	Mean	SD	Q1	Q2	Q3
Airline service	PE	0.010	0.009	0.006	0.009	0.011
	IE	0.035	0.043	0.012	0.023	0.041
	CE	−0.025	0.045	−0.032	−0.014	−0.000
Scenic spot and sightseeing	PE	0.012	0.012	0.008	0.009	0.012
	IE	0.041	0.055	0.012	0.023	0.050
	CE	−0.029	0.056	−0.043	−0.012	−0.000
Accommodation and catering	PE	0.011	0.009	0.007	0.008	0.011
	IE	0.051	0.076	0.010	0.023	0.052
	CE	−0.040	0.075	−0.047	−0.015	−0.000
Travel agency and exhibition	PE	0.011	0.008	0.007	0.008	0.010
	IE	0.058	0.064	0.013	0.046	0.075
	CE	−0.047	0.065	−0.061	−0.037	−0.005
Tourism related real estate	PE	0.011	0.008	0.006	0.009	0.013
	IE	0.041	0.056	0.010	0.023	0.048
	CE	−0.030	0.055	−0.041	−0.015	−0.000
Live entertainment	PE	0.013	0.010	0.007	0.010	0.015
	IE	0.064	0.084	0.012	0.042	0.070
	CE	−0.051	0.082	−0.057	−0.031	−0.000
Total	PE	0.011	0.010	0.007	0.009	0.012
	IE	0.047	0.064	0.011	0.026	0.056
	CE	−0.035	0.064	−0.048	−0.016	−0.000

Note. PE: means promotion effect; IE means inhibition effect; CE: means combined effect.

Table 7. Differences of the Bilateral Effect Estimations by Property Ownership.

Property ownership	Effects	Mean	SD	Q1	Q2	Q3
Non-state-owned enterprises	PE	0.012	0.010	0.007	0.009	0.014
	IE	0.061	0.084	0.011	0.035	0.071
	CE	−0.048	0.083	−0.059	−0.025	−0.000
State-owned enterprises	PE	0.011	0.010	0.007	0.008	0.011
	IE	0.036	0.040	0.010	0.023	0.048
	CE	−0.025	0.041	−0.040	−0.014	−0.000
Total	PE	0.011	0.010	0.007	0.009	0.012
	IE	0.047	0.064	0.011	0.026	0.056
	CE	−0.035	0.064	−0.048	−0.016	−0.000

Note. PE: means promotion effect; IE: means inhibition effect; CE: means combined effect.

checks utilizing alternative measures. Additionally, we employ variance analysis to probe the impact of information asymmetry regarding ESG practices. The proportion and quantile distribution of these alternative measures are detailed in Table 9. Notably, the collective impact, depicted across Panel A to Panel D, exhibits consistent values, affirming the prevailing influence of the inhibitory effect of ESG practices on firm financial performance. Moreover, the quantile distribution mirrors the primary findings, indicating a greater magnitude of the combined effect in Q1 compared to Q2 or Q3.

Discussion and Implications

Discussion

Social responsibility initiatives in the hospitality and tourism industry have increasingly garnered scholarly

attention (Arici et al., 2024; Wong et al., 2021), with a primary research focus on the relationship between strategic corporate actions and firm value (Legendre et al., 2024; Peng et al., 2023). While responsible practices ostensibly benefit both tourism firms and consumers, the modern marketplace has rendered both vulnerable: consumers face misleading practices like greenwashing, and firms grapple with the ethical and strategic challenges of effective ESG communication (Ginder et al., 2021). The ESG practices information possessed by both tourism firms and consumers significantly influences the ultimate firm profitability. The information asymmetry between firms and consumers influences the dissemination of ESG practices information by firms and the interpretation of such information by consumers. Many businesses' actual performance (both the bright and dark sides) in environmental conservation, social responsibility, and governance

Table 8. Robustness Check Using Alternative Measures.

Variables	(1)	(2)	(3)	(4)
<i>Firm_size</i>	−0.009*** (0.002)	−0.002*** (0.001)	0.003*** (0.000)	0.002 (0.002)
<i>Firm_age</i>	−0.010 (0.008)	0.009** (0.004)	−0.001 (0.003)	0.033* (0.019)
<i>Tobin's Q</i>	0.042*** (0.004)	0.038*** (0.003)	0.038*** (0.002)	0.035*** (0.003)
<i>Leverage</i>	0.011** (0.005)	−0.055*** (0.008)	−0.059*** (0.005)	−0.036*** (0.010)
<i>Tangibility</i>	0.004 (0.009)	0.000 (0.009)	0.018*** (0.005)	−0.032 (0.021)
<i>Cash_ratio</i>	−0.000 (0.001)	−0.002*** (0.001)	0.001*** (0.000)	0.001 (0.001)
<i>SOE</i>	0.009*** (0.003)	0.014*** (0.002)	−0.003 (0.003)	0.020 (0.014)
Firm dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
Constant	0.244*** (0.037)	0.025 (0.023)	−0.053 (0.055)	−0.046 (0.058)
<i>ln_sigma_v</i>				
Constant	−9.144*** (0.822)	−11.371** (4.959)	−12.457 (8.488)	−15.207 (16.683)
<i>ln_sigma_w</i>				
<i>lnesg</i>	−10.566*** (1.982)	−8.822*** (1.159)		27.510 (1480.837)
<i>lne_score</i>			−2.064*** (0.542)	
<i>lns_score</i>			1.477*** (0.505)	
<i>lng_score</i>			−3.548*** (0.549)	
Constant	38.702*** (8.287)	33.019*** (4.954)	12.791*** (4.104)	−136.167 (6532.680)
<i>ln_sigma_u</i>				
<i>lnesg</i>	−3.965*** (0.499)	−6.648*** (0.576)		−4.721*** (0.353)
<i>lne_score</i>			−0.919*** (0.307)	
<i>lns_score</i>			−1.086*** (0.268)	
<i>lng_score</i>			−2.414*** (0.314)	
Constant	14.035*** (2.138)	25.172*** (2.472)	15.828*** (2.122)	17.722*** (1.513)
Observation	601	493	661	661
Log likelihood	1146.998	1041.726	1232.341	1311.602

Note. Standard errors are presented in parentheses.

* $p < .1$. ** $p < .05$. *** $p < .01$.

Table 9. The Proportion and Quantile Distribution of Alternative Measures.

Effects	Mean	SD	Q1	Q2	Q3
Panel A: lagging dependent variables					
Promotion effect	0.002	0.005	0.001	0.001	0.002
Inhibition effect	0.055	0.078	0.013	0.034	0.069
Combined effect	−0.053	0.077	−0.067	−0.033	−0.011
Panel B: exclusion of samples from the epidemic period					
Promotion effect	0.011	0.013	0.005	0.007	0.011
Inhibition effect	0.043	0.081	0.009	0.021	0.044
Combined effect	−0.033	0.078	−0.035	−0.014	−0.000
Panel C: decomposition of ESG practice components					
Promotion effect	0.011	0.012	0.006	0.008	0.011
Inhibition effect	0.051	0.079	0.012	0.027	0.057
Combined effect	−0.040	0.079	−0.048	−0.019	−0.001
Panel D: assumption of a half-normal distribution					
Promotion effect	0.000	0.000	0.000	0.000	0.000
Inhibition effect	0.060	0.080	0.018	0.039	0.074
Combined effect	−0.060	0.080	−0.074	−0.039	−0.018

structures is often not fully understood by external tourism consumers (Wu et al., 2020). This inequality of information may result in consumers being unable to accurately assess a firm's ESG risks and opportunities, thereby influencing their consumption decisions and the

profitability of tourism firms. Previous exploration of ESG practices and firm profitability relationship usually attributes to “firm reputation” advantages and “transaction cost” challenges (Wu et al., 2024). Considering the information asymmetry in the tourism market, we can

gain deeper insights into the connection between ESG practices and firm profitability.

This paper employs a two-tier SFA model to delve into the correlation between ESG practices and firm profitability. Through variance decomposition, it dissects the promoting, inhibiting, and combined effects of these practices. The results reveal that tourism firms, as the information originator, generally have more advantageous ESG practices information compared to consumers, as the information receiver. The interplay between the promotion and inhibition effects of ESG practices suggests that the inhibitory aspect prevails, leading to tourism firms achieving an actual profitability level lower than the benchmark. While, our application of the fixed effects model and system GMM reveal a positive impact of ESG practices on firm profitability, indicating a value-enhancing effect. The comparison of contrary results indicates that the joint impact of the promoting and inhibiting factors of ESG practices on firm profitability can be quantitatively assessed using the two-tier SFA model, which contains the effect of information asymmetry in the process of ESG practices communications between tourism consumers and firms.

Consumers in the tourism consumption market face a more pronounced information asymmetry regarding ESG practices compared to businesses. They encounter heightened disparities in information, implying increased uncertainty when making choices about tourism services (Nicolau & Sellers, 2010). Simultaneously, firms may possess a greater ability to mitigate this information asymmetry through strategic communication and transparency in their ESG practices (Kim & Park, 2023; Lin et al., 2024a). The explanatory power of ESG practices in determining firm profitability is evident in both their promotional and inhibitory effects. This underscores the significant influence of information asymmetry in the dynamic relationship between firms and consumers. Notably, the predominant inhibitory effect of ESG practices results in a relative negative deviation of actual firm profitability from the benchmark profitability level. This emphasizes the power of information asymmetry of ESG practice on shaping the financial outcomes of firms in the market.

The yearly time progression reveals that the inhibitory impact of ESG practices on firm profitability has become even more pronounced amid the COVID-19 pandemic. One possible explanation is that investing in ESG practices essentially consumes resources, potentially constraining firms from allocating their limited resources to other strategic initiatives, particularly when confronted with numerous uncertainties amid the ongoing epidemic (Wu et al., 2023). Moreover, given the pandemic's impact on the delicate tourism market, information related to ESG practices may be disrupted by the influx of external environmental data noise, and information asymmetry becomes more serious. This interference can hinder the

“firm reputation” advantages and exacerbate the “transaction cost” challenges. Besides, across diverse business types, varying degrees of harm to firm financial performance will result from asymmetric information about ESG practices between firms and consumers.

The attributes of state-owned enterprises play a crucial role in mitigating the inhibitory impact of ESG practices on the profitability of tourism firms. Compared to their private counterparts, state-owned enterprises frequently enjoy advantages stemming from political connections and unique perks tied to government procurement, subsidies, and external financing (Li & Singal, 2022). Additionally, their robust fundamentals often make them better equipped to endure risks and seasonal fluctuations in the tourism industry. Given their solid resource acquisition capabilities and the ability to maintain a relatively stable participant base in the consumption market (Lin et al., 2024b), ESG practices might have a less detrimental impact on the financial performance of state-owned enterprises when compared to private firms. State-owned enterprises, with their unique features, act as a stabilizing force, helping tourism firms navigate and counterbalance the challenges posed by ESG practices.

Theoretical Implications

This paper stands as one of the pioneering studies investigating the asymmetry of ESG practices within the tourism market, highlighting the typicality of information asymmetry in tourism scenarios. The information-intensive nature of the tourism sector, the highly competitive environment of tourism firms, and the discretionary behavior of tourism consumers accentuate the prominence of information asymmetry in the tourism context. The theoretical foundation supporting the impact of ESG practices on firm financial performance is closely linked to the advantages of “firm reputation” and the challenges associated with “transaction cost,” both intricately tied to the issue of information asymmetry. This paper provides incremental knowledge for the exploration of the relationship between ESG practices and tourism firm financial performance under information asymmetry.

This paper challenges the conventional assumption of linear symmetry by employing the two-tier SFA model, enhancing our comprehension of the bilateral effects between ESG practices and tourism firm profitability. ESG practices are posited to exert a dual influence on firm profitability, that is the promotion effect brought by “firm reputation” advantages and the inhibition effect brought by “transaction cost” challenges. This paper provides a more refined understanding of the connection between ESG practices and firm profitability, by decomposing it into two opposing effects to obtain a combined effect. That is to say, capturing the impact of information asymmetry in tourism markets, the inhibitory effect of

ESG practices results in a relative negative deviation from the firm's baseline profitability. Interestingly, this conclusion goes against the traditional assumptions of linear symmetry logic and bring us new cognition.

This paper extends the boundary of the bilateral effect relationship and underscores the heterogeneous impact of temporal changes, business types, and corporate property rights. While we identified an overall negative impact of ESG practices on firm revenue, delving into the heterogeneous effects of underlying factors may yield more valuable insights. The inhibitory effect of ESG practices on firm financial performance has intensified further during the COVID-19 pandemic, providing new evidence for our analysis of the pandemic's impact on the tourism sector. Various business types experience disparate impacts from information asymmetry, manifested in varying degrees of the inhibitory effect of ESG practices. State-owned enterprises have demonstrated increased resilience in resisting the suppressive effects of ESG practices.

Practical Implications

Understanding information asymmetry is critical to enhancing the effectiveness and transparency of ESG decision-making. First, policymakers should craft regulations and policies that enhance the transparency and quality of ESG information. Promote communication and collaboration between tourism firms and consumers. These measures aim to enhance the efficiency of the tourism consumption market, resulting in a positive impact on society and the environment. Second, private firms should intensify the promotion of their ESG practices and explore innovative approaches for disclosing ESG information. The insufficient and often inaccurate information available makes it difficult for consumers to grasp the actual performance of tourism firms in terms of social responsibility, environmental protection, and governance initiatives. Information asymmetry not only hampers these firms' ability to attract responsible consumers but may also diminish their motivation to enhance ESG performance. Third, tourism consumers should enhance their capability to analyze ESG information, enabling a better understanding and response to ESG risks. Due to information asymmetry, firms may engage in "greenwashing" behavior, fabricating or exaggerating their ESG practices, causing consumers to experience irresponsible consumption risks. Actively engaging in professional training and education can heighten awareness of ESG issues, equipping consumers with the skills to effectively utilize this information for risk assessment and decision-making in consumption.

Limitations and Future Research

This paper has certain limitations that will be addressed in future research. First, our study is confined to a sample

of listed tourism firms in China. Future research could undertake cross-national comparative studies or test the findings within the context of small and medium-sized tourism firms. Second, despite conducting a series of robustness tests on the two-sided SFA model, it might be challenging to entirely mitigate the impact of endogeneity. Future research could delve into model enhancements to more effectively address concerns related to endogeneity. Third, this paper focuses exclusively on the impact of information asymmetry on the communication of ESG practices between tourism firms and consumers, neglecting the role of other stakeholders. Future research could explore the interactions and communications among other key stakeholders under information asymmetry, thereby assessing their influence on tourism firms' operational efficiency, stock market returns, and other performance dimensions.

Author Contributions

Dongdong Wu: Conceptualization; Data curation; Methodology; Writing - original draft; Writing - review & editing.

Hui Li: Conceptualization; Funding acquisition; Supervision; Writing - original draft; Writing - review & editing.


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References

- Aguinis, H., Rupp, D. E., & Glavas, A. (2024). Corporate social responsibility and individual behaviour. *Nature Human Behaviour*, 8, 219–227. <https://doi.org/10.1038/s41562-023-01802-7>.
- Arici, H. E., Saydam, M. B., Sökmen, A., & Cakmakoglu Arici, N. (2024). Corporate social responsibility in hospitality and tourism: A systematic review. *The Service Industries Journal*. Advance online publication. <https://doi.org/10.1080/02642069.2024.2345299>

- Assaf, A. G., & Josiassen, A. (2016). Frontier analysis: A state-of-the-art review and meta-analysis. *Journal of Travel Research*, 55(5), 612–627. <https://doi.org/10.1177/0047287515569776>
- Back, K. J. (2024). ESG for the hospitality and tourism research: Essential demanded research area for all. *Tourism Management*, 105, 104954. <https://doi.org/10.1016/j.tourman.2024.104954>
- Bothello, J., Ioannou, I., Porumb, V. A., & Zengin-Karaibrahimglu, Y. (2023). CSR decoupling within business groups and the risk of perceived greenwashing. *Strategic Management Journal*, 44(13), 3217–3251. <https://doi.org/10.1002/smj.3532>
- Chen, M.-H., Chen, C.-C., & Jiang, Y. (2022). Risk reduction effect of hospitality philanthropic giving: Theoretical framework and empirical evidence. *International Journal of Hospitality Management*, 103, 103224. <https://doi.org/10.1016/j.ijhm.2022.103224>
- Chen, S., Song, Y., & Gao, P. (2023). Environmental, social, and governance (ESG) performance and financial outcomes: Analyzing the impact of ESG on financial performance. *Journal of Environmental Management*, 345, 118829. <https://doi.org/10.1016/j.jenvman.2023.118829>
- Cornell, B., & Shapiro, A. C. (1987). Corporate stakeholders and corporate finance. *Financial Management*, 16(1), 5–14. <https://doi.org/10.2307/3665543>
- Dogru, T., Akyildirim, E., Cepni, O., Ozdemir, O., Sharma, A., & Yilmaz, M. H. (2022). The effect of environmental, social and governance risks. *Annals of Tourism Research*, 95, 103432. <https://doi.org/10.1016/j.annals.2022.103432>
- Geremew, Y. M., Huang, W.-J., & Hung, K. (2024). Fuzzy-set qualitative comparative analysis as a mixed-method and analysis technique: A comprehensive systematic review. *Journal of Travel Research*, 63(1), 3–26. <https://doi.org/10.1177/00472875231168619>
- Ginder, W., Kwon, W. S., & Byun, S. E. (2021). Effects of internal-external congruence-based CSR positioning: An attribution theory approach. *Journal of Business Ethics*, 169, 355–369. <https://doi.org/10.1007/s10551-019-04282-w>
- Hu, B., Shen, L., & Dong, J. (2020). The market value effect of corporate social responsibility of listed tourism enterprises in China: A perspective of marketing strategy. *Tourism Tribune*, 35(10), 15–27. <https://doi.org/10.14134/j.cnki.cn33-1336/f.2024.09.006>
- Hwang, D. H. S., Song, H. J., Lee, S., & Kang, K. H. (2024). The moderating role of national economic development on the relationship between ESG and firm performance in the global hospitality industry. *International Journal of Hospitality Management*, 120, 103788. <https://doi.org/10.1016/j.ijhm.2024.103788>
- Johnsen, D. B. (2009). The ethics of “commercial bribery”: Integrative social contract theory meets transaction cost economics. *Journal of Business Ethics*, 88, 791–803. <https://doi.org/10.1007/s10551-009-0323-6>
- Kim, E.-H., & Lyon, T. P. (2015). Greenwash vs. brownwash: Exaggeration and undue modesty in corporate sustainability disclosure. *Organization Science*, 26(3), 705–723. <https://doi.org/10.1287/orsc.2014.0949>
- Kim, J. W., & Park, C. K. (2023). Can ESG performance mitigate information asymmetry? Moderating effect of assurance services. *Applied Economics*, 55(26), 2993–3007. <https://doi.org/10.1080/00036846.2022.2107991>
- Kim, K.-H., Kim, M., & Qian, C. (2018). Effects of corporate social responsibility on corporate financial performance: A competitive-action perspective. *Journal of Management*, 44(3), 1097–1118. <https://doi.org/10.1177/0149206315602530>
- Koh, Y. (2024). The industry-academia gap on the corporate governance issues in tourism and hospitality: A critical review and future research suggestions. *Journal of Travel & Tourism Marketing*, 41(1), 3–19. <https://doi.org/10.1080/10548408.2023.2229364>
- Kumbhakar, S. C., & Parmeter, C. F. (2009). The effects of match uncertainty and bargaining on labor market outcomes: Evidence from firm and worker specific estimates. *Journal of Productivity Analysis*, 31, 1–14. <https://doi.org/10.1007/s11123-008-0117-3>
- Lee, S., Yeon, J., & Song, H. J. (2023). Current status and future perspective of the link of corporate social responsibility-corporate financial performance in the tourism and hospitality industry. *Tourism Economics*, 29(7), 1703–1735. <https://doi.org/10.1177/13548166221140505>
- Lee, W., & Lu, L. (2025). Good theories predict: Unveiling the untapped potential of “necessity” theorizing. *Journal of Hospitality & Tourism Research*, 49(2), 219–234. <https://doi.org/10.1177/10963480231188666>
- Legendre, T. S., Ding, A., & Back, K.-J. (2024). A bibliometric analysis of the hospitality and tourism environmental, social, and governance (ESG) literature. *Journal of Hospitality and Tourism Management*, 58, 309–321. <https://doi.org/10.1016/j.jhtm.2024.01.003>
- Li, H., & Wu, D. (2024). Online investor attention and firm restructuring performance: Insights from an event-based DEA-Tobit model. *Omega*, 122, 102967. <https://doi.org/10.1016/j.omega.2023.102967>
- Li, Y., & Singal, M. (2022). Corporate governance in the hospitality and tourism industry: Theoretical foundations and future research. *Journal of Hospitality & Tourism Research*, 46(7), 1347–1383. <https://doi.org/10.1177/10963480211011718>
- Lian, Y., Liu, C., & Parmeter, C. F. (2023). Two-tier stochastic frontier analysis using Stata. *The Stata Journal*, 23(1), 197–229. <https://doi.org/10.1177/1536867X231162033>
- Lin, M. S., Sharma, A., Pan, B., & Quadri-Felitti, D. (2023). Information asymmetry in the innovation adoption decision of tourism and hospitality SMEs in emerging markets: A mixed-method analysis. *Tourism Management*, 99, 104793. <https://doi.org/10.1016/j.tourman.2023.104793>
- Lin, M. S., Zhang, H., Luo, Y., & Li, Y. (2024a). Environmental, social, and governance (ESG) measurement in the tourism and hospitality industry: Views from a developing country. *Journal of Travel & Tourism Marketing*, 41(1), 154–168. <https://doi.org/10.1080/10548408.2023.2293008>
- Lin, Y., Lu, Z., Fan, D., & Zheng, Z. (2024b). The bright and dark sides of ESG during the COVID-19 pandemic: Evidence from China hospitality industry. *International Journal of Contemporary Hospitality Management*, 36(4), 1393–1417. <https://doi.org/10.1108/IJCHM-11-2022-1384>

- Liu, B., Deng, R., & Luo, C. (2024). A study of peer effects in the digital transformation of listed companies in tourism and related service enterprises. *Tourism Tribune*, 39(10), 49–69. <https://doi.org/10.19765/j.cnki.1002-5006.2020.10.007>
- Ma, R., Liu, H., Li, Z., Ma, Y., & Fu, S. (2024). Promoting sustainable development: Revisiting digital economy agglomeration and inclusive green growth through two-tier stochastic frontier model. *Journal of Environmental Management*, 355, 120491. <https://doi.org/10.1016/j.jenvman.2024.120491>
- Majeed, S., & Kim, W. G. (2023). A reflection of greenwashing practices in the hospitality industry: A scoping review. *International Journal of Contemporary Hospitality Management*, 35(3), 1125–1146. <https://doi.org/10.1108/IJCHM-04-2022-0495>
- Moneva, J. M., Bonilla-Priego, M. J., & Ortas, E. (2020). Corporate social responsibility and organisational performance in the tourism sector. *Journal of Sustainable Tourism*, 28(6), 853–872. <https://doi.org/10.1080/09669582.2019.1707838>
- Murè, P., Spallone, M., Mango, F., Marzioni, S., & Bittucci, L. (2021). ESG and reputation: The case of sanctioned Italian banks. *Corporate Social Responsibility and Environmental Management*, 28(1), 265–277. <https://doi.org/10.1002/csr.2047>
- Narula, R., Rao, P., Kumar, S., & Paltrinieri, A. (2025). ESG investing & firm performance: Retrospections of past & reflections of future. *Corporate Social Responsibility and Environmental Management*, 32(1), 1096–1121. <https://doi.org/10.1002/csr.2982>
- Nicolau, J. L., & Sellers, R. (2010). The quality of quality awards: Diminishing information asymmetries in a hotel chain. *Journal of Business Research*, 63(8), 832–839. <https://doi.org/10.1016/j.jbusres.2009.06.009>
- Ozdemir, O., Erkmén, E., & Han, W. (2023). EPU and financial performance in the hospitality and tourism industry: Moderating effect of CSR, institutional ownership and cash holding. *Tourism Management*, 98, 104769. <https://doi.org/10.1016/j.tourman.2023.104769>
- Park, J., Lee, H., & Kim, C. (2014). Corporate social responsibilities, consumer trust and corporate reputation: South Korean consumers' perspectives. *Journal of Business Research*, 67(3), 295–302. <https://doi.org/10.1016/j.jbusres.2013.05.016>
- Papadopoulos, A. (2015). The half-normal specification for the two-tier stochastic frontier model. *Journal of Productivity Analysis*, 43, 225–230. <https://doi.org/10.1007/s11123-014-0389-8>
- Papagiannakis, G. E., Vlachos, P. A., Koritos, C. D., & Kassimis, G. I. (2024). Are publicly traded tourism and hospitality providers greenwashing? *Tourism Management*, 103, 104893. <https://doi.org/10.1016/j.tourman.2024.104893>
- Peng, X., Wang, H., Fang, P., Song, W., & Zhou, D. (2023). Mapping progress in hospitality CSR research: A bibliometric review from 2006 to 2023. *Journal of Hospitality and Tourism Management*, 57, 284–302. <https://doi.org/10.1016/j.jhtm.2023.09.003>
- Poretti, C., & Heo, C. Y. (2022). COVID-19 and firm value drivers in the tourism industry. *Annals of Tourism Research*, 95, 103433. <https://doi.org/10.1016/j.annals.2022.103433>
- Preston, L. E., & O'bannon, D. P. (1997). The corporate social-financial performance relationship: A typology and analysis. *Business & Society*, 36(4), 419–429. <https://doi.org/10.1177/000765039703600406>
- Qiu, S. C., Jiang, J., Liu, X., Chen, M.-H., & Yuan, X. (2021). Can corporate social responsibility protect firm value during the COVID-19 pandemic? *International Journal of Hospitality Management*, 93, 102759. <https://doi.org/10.1016/j.ijhm.2020.102759>
- Shen, H., Lin, H., Han, W., & Wu, H. (2023). ESG in China: A review of practice and research, and future research avenues. *China Journal of Accounting Research*, 16(3), 100325. <https://doi.org/10.1016/j.cjar.2023.100325>
- Shin, H., Song, H. J., & Kang, K. H. (2024). The moderating effect of interest rates on the relationship between ESG and firm performance in the US restaurant industry. *Journal of Sustainable Tourism*. Advance online publication. <https://doi.org/10.1080/09669582.2024.2382427>
- Singal, M. (2015). How is the hospitality and tourism industry different? An empirical test of some structural characteristics. *International Journal of Hospitality Management*, 47, 116–119. <https://doi.org/10.1016/j.ijhm.2015.03.006>
- Song, H. J., Yeon, J., & Lin, M. S. (2024). The more diverse, the better? Exploring the moderating role of hospitality top management team diversity on CSR-FP link. *International Journal of Hospitality Management*, 117, 103650. <https://doi.org/10.1016/j.ijhm.2023.103650>
- Song, W., & Han, X. (2022). The bilateral effects of foreign direct investment on green innovation efficiency: Evidence from 30 Chinese provinces. *Energy*, 261, 125332. <https://doi.org/10.1016/j.energy.2022.125332>
- Taddeo, S., Agnese, P., & Busato, F. (2024). Rethinking the effect of ESG practices on profitability through cross-dimensional substitutability. *Journal of Environmental Management*, 352, 120115. <https://doi.org/10.1016/j.jenvman.2024.120115>
- Theodoulidis, B., Diaz, D., Crotto, F., & Rancati, E. (2017). Exploring corporate social responsibility and financial performance through stakeholder theory in the tourism industries. *Tourism Management*, 62, 173–188. <https://doi.org/10.1016/j.tourman.2017.03.018>
- Todaro, D. L., & Torelli, R. (2024). From greenwashing to ESG-washing: A focus on the circular economy field. *Corporate Social Responsibility and Environmental Management*, 31(5), 4034–4046. <https://doi.org/10.1002/csr.2786>
- Ullah, S., Akhtar, P., & Zafarian, G. (2018). Dealing with endogeneity bias: The generalized method of moments (GMM) for panel data. *Industrial Marketing Management*, 71, 69–78. <https://doi.org/10.1016/j.indmarman.2017.11.010>
- Wang, J., & Xia, W. (2022). Public attention and investment efficiency: Incentive effect or deterrent effect? Analysis on heterogeneous bilateral stochastic frontier model. *Technological Forecasting and Social Change*, 185, 122043. <https://doi.org/10.1016/j.techfore.2022.122043>
- Wang, L., & Chen, L. (2023). Impacts of digital economy agglomeration on carbon emission: A two-tier stochastic frontier and spatial decomposition analysis of China. *Sustainable Cities and Society*, 95, 104624. <https://doi.org/10.1016/j.scs.2023.104624>

- Wong, A. K. F., Köseoglu, M. A., & Kim, S. S. (2021). The intellectual structure of corporate social responsibility research in tourism and hospitality: A citation/co-citation analysis. *Journal of Hospitality and Tourism Management*, 49, 270–284. <https://doi.org/10.1016/j.jhtm.2021.09.015>
- Wu, D., Li, H., & Liu, Y.-F. (2024). Doing well by doing right: Heterogeneous effects of tourism firms' social responsibility on service productivity and profitability. *Current Issues in Tourism*, 27(24), 4693–4713. <https://doi.org/10.1080/13683500.2023.2283558>
- Wu, D., Li, H., & Yang, J. (2023). How does social responsibility investment strategy contribute to hospitality firms' recovery from public health emergencies? The case of COVID-19 pandemic. *International Journal of Hospitality Management*, 113, 103530. <https://doi.org/10.1016/j.ijhm.2023.103530>
- Wu, Y., Zhang, K., & Xie, J. (2020). Bad greenwashing, good greenwashing: Corporate social responsibility and information transparency. *Management Science*, 66(7), 3095–3112. <https://doi.org/10.1287/mnsc.2019.3340>
- Xie, J., Nozawa, W., Yagi, M., Fujii, H., & Managi, S. (2019). Do environmental, social, and governance activities improve corporate financial performance? *Business Strategy and the Environment*, 28(2), 286–300. <https://doi.org/10.1002/bse.2224>
- Ye, X., Fu, Y.-K., Wang, H., & Zhou, J. (2023). Information asymmetry evaluation in hotel E-commerce market: Dynamics and pricing strategy under pandemic. *Information Processing & Management*, 60(1), 103117. <https://doi.org/10.1016/j.ipm.2022.103117>
- Zhang, H., Zhang, J., Yang, Y., & Zhou, Q. (2018). Bargaining power in tourist shopping. *Journal of Travel Research*, 57(7), 947–961. <https://doi.org/10.1177/0047287517724917>
- Zhou, G., Liu, L., & Luo, S. (2022). Sustainable development, ESG performance and company market value: Mediating effect of financial performance. *Business Strategy and the Environment*, 31(7), 3371–3387. <https://doi.org/10.1002/bse.3089>

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