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Exploring the Financial Perspective in Sustainability Strategies: The Case of the Tourism Industry

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ABSTRACT

This study examines the relationship between sustainability and corporate financial performance in the tourism sector. To address the mixed and inconclusive evidence in prior research, we develop an integrated theoretical framework that combines stakeholder theory, the resource-based view, legitimacy theory, and agency theory and distinguishes between value-creation and risk-perception mechanisms. Using a global panel of 141 listed tourism firms across 26 countries over the period 2002–2021, we adopt a multidimensional perspective on financial performance grounded in the Economic Value Added framework, jointly considering return on equity and the cost of equity. The results show that sustainability has no significant effect on short-term profitability but is associated with a higher cost of equity. These findings highlight asymmetric effects across financial dimensions, suggesting that sustainability may generate offsetting value effects while increasing perceived risk. Overall, the study contributes to the sustainability-finance literature by offering a unified theoretical framework and showing how sustainability influences different dimensions of financial performance through distinct, potentially conflicting mechanisms.

JEL Classification: G32, M14

1 | Introduction

Sustainability has become a central yet contentious dimension of corporate strategy, particularly in the tourism sector, where firms are deeply embedded in environmental and social ecosystems (Moneva et al. 2020; Uyar et al. 2020) and face intense stakeholder scrutiny. Tourism activities entail substantial environmental footprints and involve diverse and often vulnerable stakeholders, making sustainability both a strategic necessity and a source of tension (Uyar et al. 2020; Tran et al. 2021). Although tourism creates economic and social value, it also imposes high costs on local communities and natural systems, including biodiversity loss (de Grosbois 2012; Su et al. 2020). Despite a large body of research, the relationship between sustainability and corporate financial performance

(CFP) remains theoretically ambiguous and empirically inconclusive (Alatawi et al. 2023; Lee et al. 2023), highlighting the need to better understand the underlying mechanisms.

This ambiguity largely stems from a lack of theoretical integration in prior research. Existing contributions often rely on isolated perspectives, such as stakeholder theory, the resource-based view (RBV), legitimacy theory, or agency theory, without explicitly reconciling their predictions. As a result, the mechanisms through which sustainability affects financial outcomes remain only partially understood.

A second limitation is that the literature predominantly adopts a unidimensional view of financial performance, typically focusing on accounting-based measures such as profitability. This

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approach overlooks the possibility that sustainability may affect firm value through multiple, potentially offsetting channels. In particular, sustainability initiatives may simultaneously generate benefits (e.g., stronger stakeholder relationships, enhanced capabilities, and better legitimacy) and costs (e.g., inefficient resource allocation), thereby affecting different dimensions of financial performance in distinct ways. Ignoring this multidimensionality may partly explain the mixed empirical evidence documented in prior studies and limit the ability to interpret seemingly conflicting findings.

To address these gaps, this study develops an integrated framework that links sustainability to financial performance through two core mechanisms: value creation and risk perception. Although prior theories offer competing predictions, we argue that their insights can be reconciled by recognizing that sustainability affects both firms' ability to generate value and investors' risk perception. We further introduce two key frictions: temporal mismatch between costs and benefits and information asymmetry that shape the net effect of sustainability across different financial dimensions and help explain heterogeneous empirical findings.

Building on this framework, we adopt a multidimensional perspective on financial performance based on the Economic Value Added (EVA) approach. Specifically, we jointly examine return on equity (ROE), which captures short-term profitability, and the cost of equity, which captures investor risk perception. This allows us to disentangle how sustainability affects different dimensions of CFP, rather than treating financial performance as a single outcome.

Empirically, we analyze a panel of 141 listed tourism firms across 26 countries and six industries over the period 2002–2021. We employ a dynamic panel data approach using the system GMM estimator, which accounts for persistence in financial performance and unobserved heterogeneity (Arellano and Bover 1995; Blundell and Bond 1998).

This paper makes two main contributions. First, it develops a unified theoretical framework that integrates stakeholder theory, the RBV, legitimacy theory, and agency theory to explain how sustainability simultaneously affects value creation and risk perception. Incorporating temporal mismatch and information asymmetry as key frictions helps clarify the inconsistent findings in prior research.

Second, it advances the sustainability-CFP literature by adopting a multidimensional perspective on financial performance. Instead of asking whether sustainability “pays,” the analysis examines how it influences different financial dimensions through potentially offsetting mechanisms. By jointly considering profitability and the cost of equity within an EVA-based framework, we disentangle value-creation and risk-perception effects and show that sustainability can have asymmetric impacts. Focusing on the tourism sector, characterized by complex stakeholder environments and strategically significant sustainability investments, we provide new cross-country evidence from a large international panel dataset, contributing to a still limited empirical literature.

2 | Literature Review and Hypotheses

The next subsections develop our framework and hypotheses by reviewing the role of sustainability in the tourism sector and the mechanisms linking it to CFP.

2.1 | Perspectives on Sustainability in the Tourism Sector

In the tourism sector, sustainability has become increasingly embedded in corporate practices. However, its adoption remains heterogeneous and largely driven by managerial discretion rather than standardized organizational practices (Lee et al. 2023). Managerial discretion in balancing shareholder value with broader societal expectations (Inoue and Lee 2011) is shaped by structural and contextual factors such as stakeholder pressure, industry characteristics (e.g., airlines, casinos, and hotels), firm size and age, market positioning, and reputational concerns (Miller 2001; Martínez et al. 2013; Lin et al. 2018; Chan et al. 2020).

This heterogeneity in sustainability engagement is likely to be reflected in the variability of sustainability-related performance outcomes. Literature identifies several channels through which sustainability may generate value, including enhanced reputation and brand image (Kang et al. 2016; Li et al. 2019), increased customer loyalty (Nicolau 2008), and stronger competitive positioning (Mair and Jago 2010). In addition, sustainability initiatives may contribute to long-term value creation and risk perception (Kang et al. 2016; Park et al. 2017), as well as improved stakeholder relationships, including employee engagement and community well-being (Lee et al. 2018; Su and Swanson 2019).

However, sustainability initiatives often entail upfront costs and uncertain returns, with benefits that may not materialize immediately or be guaranteed. As a result, their overall impact on CFP remains unclear, warranting a more nuanced assessment across various financial outcomes.

2.2 | The Impact of Sustainability on CFP in the Tourism Sector

Although the relationship between sustainability and CFP in the tourism sector has been widely studied (Kim et al. 2018; Alatawi et al. 2023), empirical findings remain mixed and inconclusive, reflecting the heterogeneity in sustainability engagement and its underlying mechanisms (Wang et al. 2019). Although some studies identify negative effects of sustainability on CFP (Dogru and Sirakaya-Turk 2016; Kim et al. 2016; Shin et al. 2021), others report positive effects (Choi and Lee 2018; Assaf et al. 2017; Shin et al. 2021), and others find no significant relationship (Chen and Lin 2015; Chen 2019). These discrepancies often reflect differences in sustainability and performance measures (Lee et al. 2023), model choices (Alatawi et al. 2023; Lee et al. 2023), and time horizons (Park and Lee 2009; Park et al. 2017), with short-term analyses potentially underestimating benefits that materialize only gradually as stakeholder trust develops (Alatawi et al. 2023).

These patterns are further shaped by industry- and region-specific factors. Performance and risk profiles differ across tourism industries, with airlines often displaying weaker CFP than hotels (Casado-Díaz et al. 2014). Even within the same industry, empirical findings are far from uniform: In the airline industry, for instance, Lee and Park (2009) found positive effects of sustainability, whereas Lee et al. (2018) found no significant effects, and Kang et al. (2010) reported negative ones. Similar variation is also observed in studies of casinos, hotels, and restaurants (Lee et al. 2023).

Table 1 synthesizes this fragmented body of evidence by organizing studies across different time periods, geographical contexts, and tourism industries, each characterized by distinct competitive, regulatory, and demand conditions. By structuring a broad and heterogeneous set of empirical contributions, the table facilitates comparison across findings that would otherwise be difficult to reconcile. Importantly, it suggests that the observed inconsistencies are not necessarily contradictory but rather reflect differences in contextual conditions and methodological approaches. As a result, the existing evidence is difficult to generalize across industries and contexts (García-Rodríguez and del mar Armas Cruz 2007), highlighting the need for a more integrated and theoretically grounded explanation of the sustainability–CFP relationship.

2.3 | Theoretical Foundations: An Integrated Framework

Building on the mixed and context-dependent evidence summarized in Table 1, no single theoretical perspective appears sufficient to fully explain the sustainability–CFP relationship in the tourism sector. To address this complexity, we develop an integrated framework built around two core mechanisms: value creation, which affects profitability, and risk perception, which affects actual risk and the cost of capital. To explain how these mechanisms operate, we draw on four complementary theoretical perspectives: stakeholder theory (Freeman 1984), the RBV (Barney 1991), legitimacy theory (Suchman 1995), and agency theory (Jensen and Meckling 1976). Table 2 provides a comprehensive overview of the theoretical framework developed in this study.

According to the stakeholder perspective, sustainability can create value by strengthening relationships with customers, employees, suppliers, communities, and regulators, thereby improving loyalty, service quality, and organizational commitment (Kim and Kim 2014; Jang et al. 2017; Theodoulidis et al. 2017; Kim and Kim 2019; Moneva et al. 2020). In addition, the RBV argues that, when embedded in organizational routines, innovation processes, and culture, sustainability may become a firm-specific capability that supports competitive advantage over time (Pereira-Moliner et al. 2012; González-Rodríguez et al. 2021). In contrast, agency theory highlights the potential for value disruption driven by managerial opportunism in resource allocation decisions, as managers may overinvest in corporate social responsibility activities to pursue personal reputational benefits, thereby reducing profitability (Ioannou and Serafeim 2012; Chen and Lin 2015; Choi and Lee 2018; Wang et al. 2019; Yeon et al. 2023).

TABLE 1 | Empirical evidence on the sustainability–CFP relationship.

Authors	Year	Journal	Industry	Period	N	Country	FP measure	CSR/ESG measure	Methodology	Data	Theory	Causal logic	Findings
Assaf et al.	2017	TEU	Multi-industry	2001–2012	31	United States	MVA; Sales	MSCI KLD (aggregate)	RE	Panel	Signaling; decision; cognitive dissonance	Sust/CSR/ESG × advertising → CFP	CSR strengthens ads
Casado-Díaz et al.	2014	KYB	Multi-industry	1990–2007	248	Spain	AR; Risk	CSR announcements	Event study	Event	Cybernetic	Sust/CSR/ESG → CFP; Risk	+
Chen	2019	IJHM	Multi-industry; tourism sector	1996–2011	13	Taiwan	Labor productivity; sales growth	CG (donations/sales)	FE; Granger	Panel	Value enhancement	Sust/CSR/ESG → CFP (indirect)	Mixed
Chen & Lin	2015	IJHM	Multi-industry; tourism sector	1996–2011	13	Taiwan	Return, ROA; ROE; Tobin's Q	CG (donations/sales)	FE; RE; OLS	Panel	Agency; value enhancement	Sust/CSR/ESG → CFP	Mixed
Choi & Lee	2018	IJCHM	Restaurant	2000–2013	40	United States	OCF; ROE	MSCI KLD (aggregate)	FE	Panel	Slack resource; agency	CFP → Sust/CSR/ESG	+

(Continues)

TABLE 1 | (Continued)

Authors	Year	Journal	Industry	Period	N	Country	FP measure	CSR/ESG measure	Methodology	Data	Theory	Causal logic	Findings
Dogru & Sirakaya-Turk	2016	JHFM	Hotel	2009–2013	15	United States	Abnormal returns (AR)	LEED-certified hotel openings	Event study	Event	Pollution abatement	Sust/CSR/ESG → CFP	–
García Rodríguez & Armas Cruz	2007	IJHM	Hotel	2002	80	Spain	ROA	CSR index (Likert)	OLS	Cross-section	Resource dependence	Sust/CSR/ESG → CFP	+
Inoue & Lee	2011	TM	Multi-industry	1991–2007	22	United States	ROA; Tobin's Q	KLD (strengths & concerns)	OLS	Panel	Stakeholder; RBV	Sust/CSR/ESG → CFP	Mixed
Kang et al.	2010	IJHM	Multi-industry	1991–2007	20	United States	PER; ROE; ROS; Tobin's Q	KLD (strengths & concerns)	OLS	Panel	Positivity/Negativity Bias	Sust/CSR/ESG → CFP	Mixed
Kim & Kim	2014	IJHM	Restaurant	1991–2011	165	United States	Risk; Tobin's Q	KLD (strengths & concerns)	RE	Panel	Stakeholder; moral capital (not stated)	Sust/CSR/ESG → CFP	Mixed
Lee et al.	2018	IJCHM	Airline	1991–2015	8	United States	Tobin's Q	MSCI ESG (material vs. immaterial)	FE	Panel	Stakeholder; institutional	Sust/CSR/ESG → CFP	Mixed
Lee & Park	2009	IJHM	Multi-industry	1991–2006	85	United States	AMV; ROA; ROE	KLD (strengths & concerns)	OLS; 2SLS	Panel	Stakeholder; slack resources	Sust/CSR/ESG ↔ CFP	Mixed
Moneva et al.	2020	JOST	Multi-industry	2004–2017	134	International	ROA; Tobin's Q	ESG (E, S, G)	FE; RE; GMM	Panel	Stakeholder; slack resources	Sust/CSR/ESG ↔ CFP	Mixed
Nicolau	2008	ATR	Hotel	1996–2006	2	Spain	AR; Market value	CSR announcements	Event study	Event	Stakeholder; TBL	Sust/CSR/ESG → CFP	+
Park et al.	2017	TM	Restaurant	2000–2013	39	United States	Risk	MSCI KLD (aggregate)	FE	Panel	Organizational learning; stakeholder	Sust/CSR/ESG → CFP	Mixed
Shin et al.	2021	TM	Hotel	2020	6	United States	AR	Strategic philanthropy	Event study; ANOVA	Event	Strategic philanthropy	Sust/CSR/ESG → CFP	–
Theodoulidis et al.	2017	TM	Multi-industry	2005–2014	114	United States	ROA; Tobin's Q	KLD (strengths & concerns)	FE	Panel	Stakeholder	Sust/CSR/ESG → CFP	+
Wang et al.	2019	TEU	Tourism	2003–2015	26	China	Growth; ROA; ROE; Tobin's Q	CG (donations/sales)	FE; OLS	Panel	Agency; value enhancement	Sust/CSR/ESG → CFP	Mixed

TABLE 2 | Theoretical framework and hypothesis development.

Theory	Mechanism	Drivers	Sustainability-Profitability relationship	Friction
(1) Stakeholder theory + (2) RBV	Value creation	(1) Relations with customers, employees; (2) firm-specific capabilities	(+)	Temporal mismatch: delayed effect
Agency theory	Value creation	Managerial opportunism	(−)	Temporal mismatch: immediate effect
Expected effect			Indeterminate	Not positive on short-term profitability

Theory	Mechanism	Drivers	Sustainability-risk (cost of capital) relationship	Friction
Legitimacy theory	Risk perception	Regulatory and reputational risk	(−)	Information asymmetry can weaken the credibility of sustainability signals (e.g., greenwashing concerns)
Agency theory	Risk perception	Managerial opportunism	(+)	Information asymmetry can amplify concerns about managerial opportunism
Expected effect			Indeterminate	Not negative on market-based risk/cost of capital

If we focus on the risk-perception mechanism, legitimacy theory suggests that sustainability reduces reputational and regulatory risks, thereby lowering actual risk and the cost of capital. However, agency theory indicates that sustainability initiatives may also increase perceived risk if investors interpret them as signals of managerial opportunism.

These competing mechanisms can be jointly captured through performance and risk measures that integrate accounting- and market-based dimensions.

2.4 | Hypotheses

We conceptualize financial performance using the EVA approach (Stern et al. 1995). EVA represents a suitable and novel choice in this context, as it allows us to jointly capture the key mechanisms emphasized in our framework (value creation and risk perception) within a single analytical construct. This stems from its structure, which combines two components: ROE, an accounting-based measure of profitability that reflects a short-term perspective, and the cost of equity, an economic measure that reflects risk and the opportunity cost of capital. The dual perspective of EVA, which combines accounting- and market-based components, motivates our focus on publicly listed firms, for which both components are observable. Listed firms are exposed to investor expectations and short-term performance pressures, which are central to our theoretical framework,

particularly from an agency perspective. Although private firms represent the majority of the tourism sector, data limitations and lower transparency make them less suitable for our analysis.

As highlighted in previous sections, tourism is not a homogeneous sector (Alatawi et al. 2023; Lee et al. 2023). Industries such as airlines, gambling, hotels, and travel services differ in terms of capital intensity, environmental exposure, stakeholder visibility, and regulatory pressure. These differences may be reflected in firms' sustainability strategies. To provide contextual background for interpreting the sustainability–CFP relationship, we examine whether this heterogeneity is associated with differences in sustainability engagement across tourism industries. Accordingly, our first hypothesis is as follows:

Hypothesis 1. *Sustainability engagement of listed tourism firms differs across tourism industries.*

We now turn to the analysis of the relationship between sustainability and financial performance. We disentangle the two components of EVA: ROE and the cost of equity. Focusing on ROE, stakeholder theory and the RBV suggest that sustainability investments can enhance firm value through improved stakeholder relationships and the development of valuable capabilities. In contrast, agency theory highlights the risk of managerial opportunism and inefficient resource allocation, which may negatively affect short-term performance. Taken together, these perspectives imply that the overall effect of sustainability on

profitability may be indeterminate. To more precisely identify the expected direction, we consider the role of a key source of friction, namely, temporal mismatch. The benefits emphasized by stakeholder theory and the RBV are unlikely to translate into immediate financial returns, whereas the costs associated with sustainability tend to be incurred upfront. This is particularly relevant in the tourism sector, where such investments are often costly and operationally complex. As a result, when short-term accounting measures such as ROE are considered, the overall effect may be null or negative, which provides the basis for Hypothesis 2.

Hypothesis 2. *Ceteris paribus, sustainability in listed tourism firms is associated with a null or negative effect on short-term accounting profitability, measured by ROE.*

A similar reasoning applies to the cost of equity. Legitimacy theory suggests that sustainability engagement reduces reputational and regulatory risk, thereby lowering the cost of equity. However, agency theory indicates that sustainability initiatives may also increase perceived risk if investors interpret them as signals of managerial opportunism. As with profitability, these opposing effects imply that the overall effect on the cost of equity may be indeterminate. To refine expectations, we consider the role of information asymmetry. Limited transparency may weaken the credibility of sustainability signals, reducing the risk-mitigating effect predicted by legitimacy theory while amplifying investor concerns about managerial opportunism. This mechanism is particularly relevant in the tourism sector, given its exposure to macroeconomic shocks, environmental pressures, and volatile demand. Such conditions increase uncertainty, which is further amplified by the central role of intangible assets, such as brand and customer experience, that are difficult to assess. Moreover, in listed firms, the separation between ownership and control may be pronounced, further amplifying information asymmetries and investor concerns. Under these conditions, investors are likely to require a higher risk premium. As a result, the overall effect may be null or positive, which motivates Hypothesis 3.

Hypothesis 3. *Ceteris paribus, sustainability in listed tourism firms is associated with a null or positive effect on the cost of equity.*

3 | Data and Methodology

3.1 | Data Source

Our paper empirically investigates the relationship between ROE or the cost of equity and sustainability scores in the tourism sector, using a panel dataset of listed firms across 26 countries from 2002 to 2021, with 1788 firm-year observations.

We form our sample using two datasets from the Refinitiv (now LSEG) database: Asset4 and Datastream. Asset4 provides sustainability performance and disclosure data, collected by analysts from internal sources (e.g., CSR and annual reports) and external ones (e.g., stock exchange filings, NGO websites, and news outlets). It includes over 450 data points across three pillars (environmental, social, and governance)

aggregated into 10 categories, with firms scored annually on a scale of 0–100.

Asset4 offers several advantages. It aggregates comprehensive, multisource sustainability data and provides composite indicators across dimensions (Ioannou and Serafeim 2012; Lee et al. 2023). Used by investors managing over \$3 trillion, including BlackRock (Serafeim 2015), Asset4 ensures high external validity through global coverage of over 9000 firms listed on major indices (e.g., S&P 500, FTSE 250, and MSCI World). Unlike the United States–focused KLD dataset, which shows weak correlation with other providers (Berg et al. 2022), Asset4 scores are more correlated (correlations of 0.6–0.8) and include firms regardless of their sustainability communication policies, reducing self-selection bias (Ioannou and Serafeim 2012; Desender and Epure 2021). Despite these advantages, Asset4 is not without limitations. ESG ratings vary across providers due to differences in scope, measurement, and weighting schemes, implying that no single, universally accepted measure of sustainability exists and that available indicators should be interpreted as proxies rather than objective benchmarks (Berg et al. 2022). In addition, Asset4 scores may be subject to historical revisions and may reflect coverage biases toward large, listed firms in developed markets. To mitigate these concerns, we conduct robustness checks using a restricted time period when scores are considered stable and adopt a conservative interpretation of the results, acknowledging that potential measurement error is likely to attenuate estimated effects.

At the same time, Asset4 is a widely used and well-established compromise in empirical research, particularly in finance and management, owing to its broad coverage, standardized structure, and multidimensional assessment of sustainability. Despite its extensive adoption in these fields, it remains relatively underutilized in tourism studies, where recent contributions encourage the use of large-scale ESG datasets to enhance empirical rigor and comparability (Lee et al. 2023).

After compiling the initial universe of firms, we construct our final sample through a sequence of filtering steps. In particular, we begin with all publicly listed firms covered by the Asset4 database, which includes approximately 9000 companies worldwide. From this universe, we identify firms operating in tourism-related industries based on the INDM5 classification, including airlines, hotels, gambling, recreational services, restaurants and bars, and travel and tourism. This initial industry-based selection yields 157 firms. We then apply data availability criteria, retaining only firms for which sustainability information is available in Asset4, specifically environmental and social scores, for at least 1 year during the sample period. In a further step, we match these firms with accounting and financial data from Datastream, requiring sufficient information to compute both ROE and the cost of equity. After applying these filters, the final sample consists of 141 listed tourism firms across 26 countries, corresponding to 1788 firm-year observations over the period 2002–2021. This sample is not intended to be representative of the entire tourism sector, which is largely composed of small and privately held firms. Rather, our focus on listed firms is consistent with the research design, as the cost of equity is observable only for publicly traded companies and is central to our analysis.

3.2 | Variable Description

As discussed in the previous section, CFP is commonly measured using two classes of indicators. The first includes accounting-based measures, which capture short-term operational performance, such as profitability. Typical examples include return on assets (ROA), ROE, and return on sales (ROS), which are widely used in tourism and hospitality research (e.g., Kim and Kim 2014; Lee and Park 2009; Theodoulidis et al. 2017). The second class includes market-based measures that reflect investors' expectations and incorporate information on past, current, and future performance, such as total shareholder return and Tobin's Q (e.g., Kang et al. 2010; Inoue and Lee 2011; Rhou et al. 2016). In addition, some studies consider risk-related outcomes, including the cost of capital and systematic risk (Husted and Allen 2010; Albuquerque et al. 2019).

In this study, we adopt a shareholder-oriented perspective and focus on the equity side of firm performance. Specifically, we use ROE and the cost of equity as our main dependent variables, as they capture complementary dimensions of financial performance. ROE reflects the firm's ability to generate profits from shareholders' investment and captures short-term operational efficiency. In contrast, the cost of equity represents the return required by investors as compensation for risk and reflects market-based risk perception. We jointly analyze these two dimensions within the EVA framework, which provides an integrated view of value by combining profitability and the cost of capital. This approach is particularly suitable for our study, as it aligns with the theoretical framework developed in Section 2.3, which distinguishes between value-creation and risk-perception mechanisms. By considering both ROE and the cost of equity, we capture how sustainability affects different components of financial performance rather than relying on a single indicator.

Although we can calculate ROE directly, we use a multistep procedure to determine the cost of equity. First, we collect daily stock prices for each year and calculate the corresponding returns. Second, we regress each firm's daily stock returns on the returns of the market portfolio, represented by the MSCI World Index. Applying a simple market model allows us to calculate annual equity betas for each firm (Brealey et al. 2020). After collecting annual data on risk-free rates and market risk premia from the Kenneth French data library,¹ we apply the Capital Asset Pricing Model to obtain annual costs of equity for each firm.

Literature often uses sustainability as a determinant of CFP and measures it in several ways. For instance, Assaf et al. (2012) distinguish environmental issues from social and economic ones. Inoue and Lee (2011) identify various sustainability activities involving stakeholders such as employees, customers, communities, and the environment. Other studies distinguish between positive and negative sustainability activities, and some consider operations-related and nonoperations-related dimensions of sustainability. Some researchers also use composite measures (García-Sánchez and Martínez-Ferrero 2019). Identifying a representative measure of sustainability is challenging, as sustainability is a multifaceted concept; for example, measuring a single aspect (e.g., corporate philanthropy) would

provide only a limited perspective on firm performance across other dimensions. Following Ioannou and Serafeim (2012), we use the environmental and social dimensions and omit the economic and corporate governance dimensions, as the latter are less closely associated with the concept of Socially Responsible Investment (Lys et al. 2015). Then, following Hillman and Keim (2001), we obtain an aggregate sustainability score for each firm by assigning equal weights to both scores. Each score, in turn, comprises several subdimensions: three for the environmental dimension (emission reduction, product innovation, and resource reduction) and four for the social dimension (community, customer/product, responsibility, human rights, and workforce). Tables 1 and A1 provide more details on the variables used in our analysis.

Although sustainability measures have been used as determinants of CFP, they are often not the only independent variables included in these models. A combination of several financial, sustainability, and other variables is typically used to identify the factors that shape CFP. We control for voluntary CSR reporting. Consistent with Dhaliwal et al. (2012) and Lys et al. (2015), we use the publication of standalone CSR reports as an indicator of CSR reporting. Our variable, *CSRDisc*, is a dummy that equals 1 if a firm publishes a separate CSR/H&S/sustainability report or a section (at least five pages) in its annual report on CSR/H&S/Sustainability and 0 otherwise. For firms that publish biannual CSR reports, *CSRDisc* equals 1 only in the year in which the report is published.

Several other controls have been used in the literature to specify better the models adopted in studies on CFP. These controls capture specific aspects of a company's operations and performance and account for potential confounding factors that may affect the relationship between sustainability and financial performance. In our study, following Sharfman and Fernando (2008) and el Ghoul et al. (2011), we control for firm size (Kim et al. 2018; García-Sánchez and Martínez-Ferrero 2019; Xie et al. 2019), financial leverage (Lee et al. 2013; Kim and Kim 2014), and firm growth. Firm size is proxied by the natural logarithm of the market capitalization; financial leverage is proxied by the total debt-to-total assets ratio; firm growth is proxied by the market-to-book ratio. All variable descriptions are in Table A1.

3.3 | Statistical Method

Various methodologies have been employed in the empirical literature to assess the impact of sustainability strategies on CFP, as shown in Table 1. Some papers use descriptive statistics and tests, classical multiple regressions (Inoue and Lee 2011; Singal 2014), GARCH models (Nicolau 2008; Casado-Díaz et al. 2014), and cybernetic models of decision-making and heuristics (Casado-Díaz et al. 2014). Lee and Park (2009) adopted two-stage least squares (2SLS), whereas some papers adopt two-way random-effects or fixed-effects models (Theodoulidis et al. 2017; Kim et al. 2018; García-Sánchez and Martínez-Ferrero 2019; Lee et al. 2023). Xie et al. (2019) adopt a two-step procedure, first estimating firm efficiency using Data Envelopment Analysis (DEA) and then running a regression to test the factors affecting it.

To analyze the impact of sustainability on ROE and the cost of equity, we use a dynamic panel regression model. This approach leverages the advantages of panel data, combining cross-sectional and time-series elements to control for unobserved heterogeneity and capture both short- and long-term dynamics. Unlike static models, dynamic models account for time effects and past outcomes, helping to address endogeneity concerns, which are particularly relevant when analyzing the relationship between sustainability and CFP (Crane et al. 2017). In our context, they allow us to estimate both the immediate and lagged effects of sustainability on CFP.

We use the following regression model:

$$Y_{i,t} = \alpha Y_{i,t-1} + \theta \text{Sustscore}_{i,t-1} + \mathbf{x}'_{i,t-1} \boldsymbol{\beta} + \mu_i + \tau_t + \varepsilon_{it} \quad (1)$$

where $Y_{i,t}$ is one of our dependent variables (either ROE or cost of equity) for the firm i at time t , with α being the coefficient on the autoregressive term; $\text{Sustscore}_{i,t-1}$ is a sustainability score (which can be either an aggregate score or one of its components), with coefficient θ ; $\mathbf{x}_{i,t-1}$ is a vector including all control variables described in the previous subsection, with a vector of coefficients $\boldsymbol{\beta}$; μ_i denotes an unobservable time-invariant firm effect; τ_t denotes an unobservable firm-invariant time effect; and ε_{it} indicates a zero-mean idiosyncratic stochastic error term. As is customary, we lag independent variables because they are likely to have delayed effects on the dependent variable.

In our paper, we estimate Equation (1) using the two-step system GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998) (see also Baltagi 2013). This estimator is particularly suitable in our context, as it addresses three key issues: (i) the dynamic nature of financial performance, (ii) unobserved firm-specific heterogeneity, and (iii) potential endogeneity of sustainability and control variables. In the system GMM framework, endogenous variables are instrumented using their own lagged values. Specifically, lagged levels of the dependent variable (dated $t-2$ and earlier) are used as instruments for the equation in first differences, whereas lagged first differences are used as instruments for the equation in levels. This structure allows us to exploit additional moment conditions and improve efficiency relative to difference GMM. Regarding the treatment of regressors, the lagged dependent variable and sustainability measures are treated as endogenous due to potential reverse causality and simultaneity. Control variables are included in the instrument matrix based on their assumed degree of exogeneity, and all regressors are lagged by one period to mitigate contemporaneous feedback effects and reflect the delayed impact of sustainability on financial performance. To avoid instrument proliferation, which may weaken the validity of overidentification tests and bias the estimates, we adopt a parsimonious instrument strategy by restricting the lag depth and collapsing the instrument matrix. This ensures that the number of instruments remains well below the number of cross-sectional units, in line with standard recommendations in the literature. Our inference is based on Windmeijer's (2005) finite sample corrected robust standard errors. Within this framework, the coefficient θ captures the short-run effect of sustainability on financial performance (Greene 2011). The corresponding

long-run effect, Θ , is computed as $\Theta = \theta/(1 - \alpha)$, accounting for the persistence captured by the autoregressive term.

4 | Results

4.1 | Descriptive Statistics

Table 3 shows the sample breakdown by country, industry, and year. As Figure 1 also shows, the three countries most represented in the sample are the United States (approximately 20% of the observations), the United Kingdom (approximately 19%),

TABLE 3 | Sample breakdown by country, industry, and year.

Country	N	%	Industry	N	%
Australia	115	6.43	Airlines	339	18.96
Austria	6	0.34	Gambling	389	21.76
Brazil	6	0.34	Hotels	124	6.94
Canada	35	1.96	Recreational services	105	5.87
Chile	12	0.67	Restaurants & bars	346	19.35
China	22	1.23	Travel & tourism	485	27.13
France	57	3.19			
Germany	38	2.13	Year	N	%
Greece	21	1.17	2002	30	1.68
Hongkong	159	8.89	2003	30	1.68
Italy	19	1.06	2004	59	3.30
Japan	293	16.39	2005	73	4.08
Malaysia	54	3.02	2006	75	4.19
New Zealand	18	1.01	2007	75	4.19
Philippines	11	0.62	2008	86	4.81
Singapore	45	2.52	2009	99	5.54
South Africa	37	2.07	2010	118	6.60
South Korea	21	1.17	2011	114	6.38
Spain	28	1.57	2012	126	7.05
Sweden	20	1.12	2013	125	6.99
Switzerland	14	0.78	2014	119	6.66
Taiwan	31	1.73	2015	113	6.32
Thailand	10	0.56	2016	107	5.98
Turkey	5	0.28	2017	105	5.87
United Kingdom	342	19.13	2018	105	5.87
United States	369	20.64	2019	99	5.54
			2020	87	4.87
Total	1788	100	2021	43	2.40

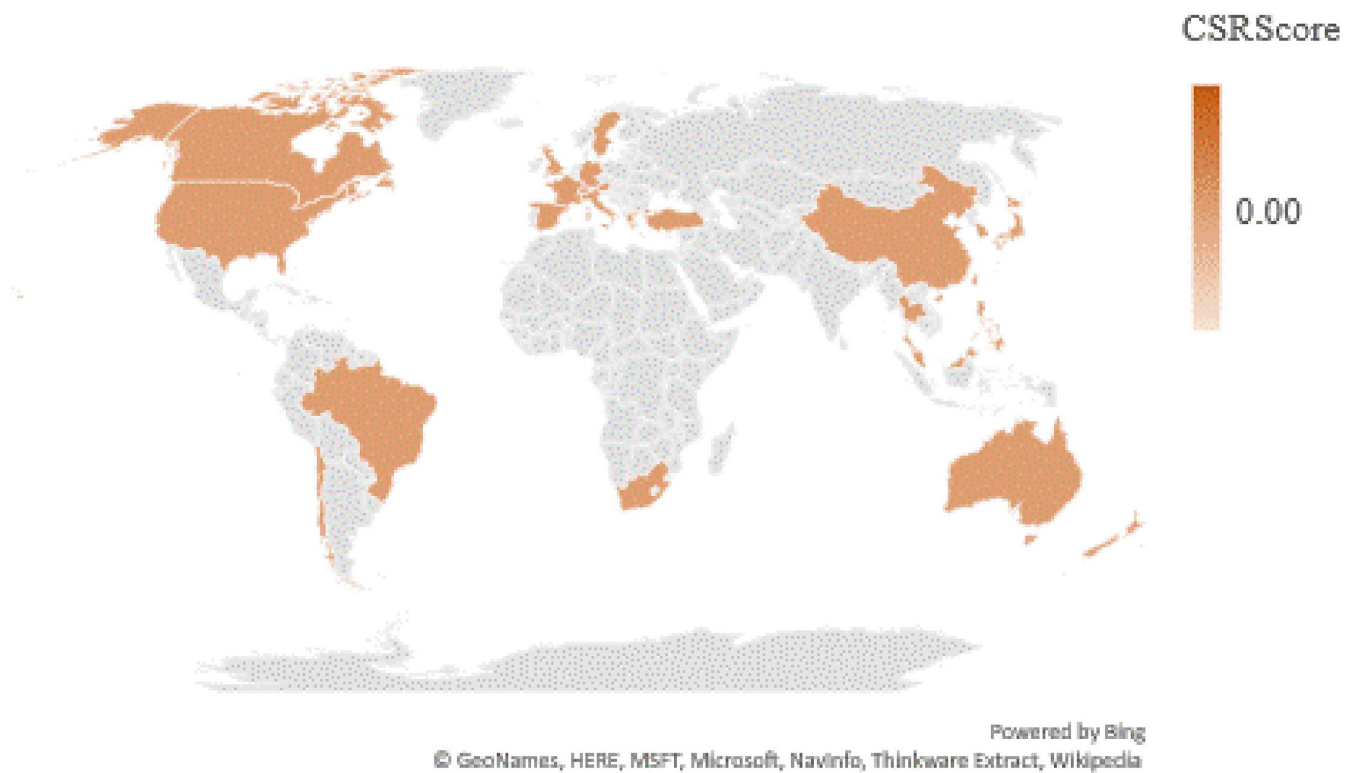


FIGURE 1 | Sustainability by country.

TABLE 4 | Descriptive statistics. The dependent and control variables, except for CSRDisc, are obtained from Datastream. The explanatory variables and CSRDisc are sourced from Asset4.

Variable	Definition	N	Mean	SD	Min	Max
Dependent variables						
ROE	Return on equity	1788	0.12	0.20	−0.34	0.60
Re	Cost of equity	1788	0.09	0.05	0.00	0.21
Explanatory variables						
SustScore	Sustainability score	1788	0.42	0.26	0.00	0.97
EnScore	Environmental score	1788	0.39	0.29	0.00	0.97
Eners	Emission reduction	1788	0.42	0.34	0.00	1.00
Enpis	Product innovation	1788	0.12	0.23	0.00	0.97
Enrr	Resource reduction	1788	0.43	0.34	0.00	1.00
SoScore	Social score	1788	0.45	0.25	0.00	0.97
Soprs	Product responsibility	1788	0.45	0.34	0.00	1.00
Socos	Community	1788	0.50	0.30	0.00	1.00
Sohrs	Human rights	1788	0.24	0.33	0.00	0.99
Sowos	Workforce	1788	0.56	0.29	0.00	1.00
Control variables						
CSRDisc	CSR report	1788	0.60	0.49	0.00	1.00
LogMV	Size	1788	22.11	1.15	17.02	25.41
DebtRatio	Leverage	1788	0.35	0.24	0.00	0.99
MTBV	Growth	1788	2.72	1.96	0.67	6.87

and Japan (approximately 16%). Travel and tourism (about 27% of observations) and gambling (about 22%) are the two most-represented tourism industries. The sample comprises 141 firms.

Tables 4 and A2 present descriptive statistics and correlations for all variables in the sample. All sustainability measures have an average value of about 0.40 (compared to a theoretical maximum of 1). The environmental subdimension product innovation records the lowest value (0.12), whereas the social subdimension workforce records the highest value (0.56).

Table 5 has three parts. On the left, the average aggregate sustainability score is reported for each country. The values range from a minimum of 0.13 in Austria to a maximum of 0.73 in France. At the top of the same table on the right, the average

aggregate sustainability scores are reported for each industry. The values range from a minimum value of 0.32 for travel and tourism to a maximum value of 0.54 for airlines. These results show variability across industries, supporting our Hypothesis 1. At the bottom, we report the probability of publishing a separate CSR/H&S/sustainability report (or at least a section of at least five pages in a firm's annual report on CSR/H&S/sustainability). This probability is 83% for Airlines, whereas the lowest, at 49%, is recorded for travel and tourism.

4.2 | Regression Results

Table 6 presents six GMM regression models explaining ROE and the cost of equity. All models are particular cases of the general model described in Equation (1). Models [1]–[3] use ROE as

TABLE 5 | Country and industry analysis.

Country	N	SustScore	SE	Industry	N	SustScore	SE
Australia	115	0.35***	0.02	Airlines	339	0.54***	0.01
Austria	6	0.13	0.09	Gambling	389	0.34***	0.01
Brazil	6	0.52***	0.09	Hotels	124	0.52***	0.02
Canada	35	0.28***	0.04	Recreational services	105	0.41***	0.02
Chile	12	0.71***	0.06	Restaurants & bars	346	0.50***	0.01
China	22	0.43***	0.05	Travel & tourism	485	0.32***	0.01
France	57	0.73***	0.03				
Germany	38	0.68***	0.04				
Greece	21	0.44***	0.05				
Hongkong	159	0.42***	0.02	Industry	N	Pr (CSRDisc = 1)	SE
Italy	19	0.63***	0.05	Airlines	339	0.83***	0.02
Japan	293	0.22***	0.01	Gambling	389	0.52***	0.03
Malaysia	54	0.34***	0.03	Hotels	124	0.65***	0.04
New Zealand	18	0.39***	0.05	Recreational services	105	0.52***	0.05
Philippines	11	0.30***	0.07	Restaurants & bars	346	0.59***	0.03
Singapore	45	0.40***	0.03	Travel & tourism	485	0.49***	0.02
South Africa	37	0.47***	0.04				
South Korea	21	0.69***	0.05				
Spain	28	0.69***	0.04				
Sweden	20	0.61***	0.05				
Switzerland	14	0.53***	0.06				
Taiwan	31	0.42***	0.04				
Thailand	10	0.51***	0.07				
Turkey	5	0.34***	0.10				
United Kingdom	342	0.47***	0.01				
United States	369	0.44***	0.01				

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

TABLE 6 | Analysis based on the aggregate scores and on the period 2002–2021.

Variable	(1) ROE	(2) ROE	(3) ROE	(4) Re	(5) Re	(6) Re
ROE ($t-1$)	0.195*** [0.056]	0.191*** [0.055]	0.196*** [0.057]			
Re ($t-1$)				0.256*** [0.050]	0.279*** [0.047]	0.253*** [0.048]
SustScore ($t-1$)	0.052 [0.047]			0.052*** [0.015]		
EnScore ($t-1$)		0.045 [0.040]			0.027* [0.014]	
SoScore ($t-1$)			0.024 [0.038]			0.052*** [0.013]
CSRDisc ($t-1$)	-0.009 [0.013]	-0.010 [0.013]	-0.006 [0.013]	0.000 [0.005]	0.003 [0.005]	0.004 [0.005]
LogMV ($t-1$)	-0.004 [0.028]	-0.004 [0.028]	-0.001 [0.028]	0.003 [0.005]	0.002 [0.005]	0.003 [0.005]
DebtRatio ($t-1$)	-0.136 [0.098]	-0.138 [0.098]	-0.124 [0.094]	-0.014 [0.017]	-0.016 [0.017]	-0.011 [0.018]
MTBV ($t-1$)	0.006 [0.011]	0.006 [0.011]	0.006 [0.011]	0.001 [0.002]	0.001 [0.002]	0.000 [0.002]
Constant	0.191 [0.625]	0.197 [0.622]	0.127 [0.622]	0.003 [0.101]	0.021 [0.101]	0.000 [0.101]
<i>N</i>	1626	1626	1626	1626	1626	1626
Arellano–Bond lag 1 (<i>p</i> value)	0.000	0.000	0.000	0.000	0.000	0.000
Arellano–Bond lag 2 (<i>p</i> value)	0.373	0.376	0.373	0.905	0.933	0.900
Sargan (<i>p</i> value)	0.127	0.130	0.115	0.000	0.000	0.000

Note: GMM estimates of the model in Equation (1). The dependent variable is either ROE or cost of equity. For variable definitions, see Subsection 3.2. All independent variables are lagged. Cluster robust standard errors in brackets.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

the dependent variable, whereas Models [4]–[6] focus on the cost of equity.

Across all specifications, sustainability has no statistically significant effect on ROE. The estimated coefficients on the aggregate sustainability score and its environmental and social components are positive but small in magnitude and not statistically different from zero (e.g., Model [1]: $\beta = 0.052$, n.s.; Model [2]: $\beta = 0.045$, n.s.; and Model [3]: $\beta = 0.024$, n.s.). This pattern indicates that, in the short term, the potential benefits of sustainability initiatives are offset by their associated costs, resulting in no discernible impact on accounting profitability, consistent with Hypothesis 2.

In contrast, sustainability is positively and significantly associated with the cost of equity across all specifications. The coefficient on the aggregate sustainability score is positive and statistically

significant at the 1% level (Model [4]: $\beta = 0.052$, $p < 0.01$), indicating that higher sustainability performance is associated with higher required returns by investors. Similar results are obtained when considering environmental and social dimensions separately (Models [5] and [6]), although the magnitude of the effect varies across specifications (Model [5]: $\beta = 0.027$, $p < 0.10$; Model [6]: $\beta = 0.052$, $p < 0.01$). These findings are consistent with Hypothesis 3.

To assess the validity of the dynamic specifications, we rely on standard diagnostic tests for system GMM estimators reported at the bottom of Table 6. The Arellano–Bond tests display the expected pattern of serial correlation, supporting the validity of the moment conditions and the use of lagged variables as instruments. With respect to overidentification tests, the results differ across dependent variables. For the ROE specifications, the tests do not raise major concerns about instrument validity.

TABLE 7 | Analysis based on single components.

Panel A							
	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Variable	ROE	ROE	ROE	ROE	ROE	ROE	ROE
Roe ($t-1$)	0.193*** [0.056]	0.192*** [0.055]	0.192*** [0.056]	0.193*** [0.057]	0.195*** [0.056]	0.197*** [0.057]	0.194*** [0.057]
Eners ($t-1$)	0.022 [0.028]						
Enpis ($t-1$)		0.068 [0.054]					
Enrrs ($t-1$)			0.027 [0.031]				
Soprs ($t-1$)				0.009 [0.022]			
Socos ($t-1$)					0.007 [0.036]		
Sohrs ($t-1$)						0.030 [0.032]	
Sowos ($t-1$)							-0.011 [0.033]
CSRDisc ($t-1$)	-0.008 [0.013]	-0.005 [0.013]	-0.008 [0.013]	-0.004 [0.013]	-0.005 [0.013]	-0.006 [0.013]	-0.004 [0.013]
LogMV ($t-1$)	-0.002 [0.029]	-0.001 [0.028]	-0.002 [0.028]	-0.000 [0.028]	0.000 [0.029]	-0.001 [0.028]	0.003 [0.028]
DebtRatio ($t-1$)	-0.129 [0.098]	-0.125 [0.090]	-0.132 [0.096]	-0.121 [0.091]	-0.115 [0.091]	-0.126 [0.092]	-0.109 [0.096]
MTBV ($t-1$)	0.006 [0.011]	0.005 [0.010]	0.006 [0.011]	0.005 [0.011]	0.006 [0.011]	0.005 [0.011]	0.005 [0.011]
Constant	0.165 [0.628]	0.129 [0.609]	0.160 [0.618]	0.110 [0.607]	0.100 [0.629]	0.147 [0.622]	0.046 [0.616]
<i>N</i>	1626	1626	1626	1626	1626	1626	1626
Arellano–Bond lag 1 (<i>p</i> value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arellano–Bond lag 2 (<i>p</i> value)	0.370	0.411	0.382	0.383	0.378	0.372	0.387
Sargan (<i>p</i> value)	0.119	0.134	0.125	0.109	0.108	0.107	0.108
Panel B							
	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Variable	Re	Re	Re	Re	Re	Re	Re
Re ($t-1$)	0.275*** [0.046]	0.295*** [0.041]	0.288*** [0.045]	0.274*** [0.046]	0.268*** [0.046]	0.297*** [0.043]	0.283*** [0.044]

(Continues)

TABLE 7 | (Continued)

Panel B							
	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Variable	Re	Re	Re	Re	Re	Re	Re
Eners ($t-1$)	0.025** [0.011]						
Enpis ($t-1$)		0.007 [0.012]					
Enrrs ($t-1$)			0.010 [0.010]				
Soprs ($t-1$)				0.021** [0.008]			
Socos ($t-1$)					0.030*** [0.010]		
Sohrs ($t-1$)						0.019** [0.009]	
Sowos ($t-1$)							0.022** [0.011]
CSRDisc ($t-1$)	0.003 [0.005]	0.008* [0.005]	0.006 [0.005]	0.007 [0.004]	0.006 [0.004]	0.006 [0.005]	0.006 [0.004]
LogMV ($t-1$)	0.001 [0.005]	0.002 [0.005]	0.002 [0.005]	0.002 [0.005]	−0.000 [0.005]	0.002 [0.004]	0.003 [0.004]
DebtRatio ($t-1$)	−0.018 [0.017]	−0.013 [0.018]	−0.015 [0.017]	−0.013 [0.018]	−0.018 [0.018]	−0.018 [0.018]	−0.009 [0.018]
MTBV ($t-1$)	0.001 [0.002]	0.001 [0.002]	0.001 [0.002]	0.000 [0.002]	0.001 [0.002]	0.001 [0.002]	0.001 [0.002]
Constant	0.049 [0.100]	0.030 [0.104]	0.023 [0.101]	0.024 [0.104]	0.065 [0.098]	0.032 [0.099]	−0.007 [0.099]
<i>N</i>	1626	1626	1626	1626	1626	1626	1626
Arellano–Bond lag 1 (<i>p</i> value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arellano–Bond lag 2 (<i>p</i> value)	0.982	0.747	0.844	0.893	0.917	0.886	0.899
Sargan (<i>p</i> value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: GMM estimates of the model in Equation (1). The dependent variable is ROE. For variable definitions, see Subsection 3.2. All independent variables are lagged. Cluster-robust standard errors in brackets.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

For the cost-of-equity specifications, however, the tests provide less satisfactory results, suggesting that these estimates should be interpreted with greater caution. This outcome is not uncommon for market-based variables, which tend to be more volatile and more sensitive to model specification. Accordingly, we do not rely exclusively on overidentification tests to assess the credibility of the estimates; rather, we combine diagnostic evidence with a parsimonious instrument strategy, a restricted lag depth,

and robustness checks using alternative samples and estimation methods.

Focusing on the subdimensions (Table 7), the increase in the cost of equity appears to be driven by several specific components. In particular, emission reduction is positively and significantly associated with the cost of equity (Model [14]: $\beta = 0.025$, $p < 0.05$). Within the social dimension, all four

components show positive and statistically significant effects: customer/product responsibility (Model [17]: $\beta=0.021$, $p<0.05$), community (Model [18]: $\beta=0.030$, $p<0.01$), human rights (Model [19]: $\beta=0.019$, $p<0.05$), and workforce (Model [20]: $\beta=0.022$, $p<0.05$). Among these, community shows the largest estimated coefficient. These results suggest that the positive association between sustainability and the cost of equity is not confined to a single dimension but is particularly pronounced for social components and, to a lesser extent, emission-related environmental initiatives.

Several robustness checks are performed and presented in Tables 8 and 9 to assess the stability of our findings and address potential sources of bias. First, following concerns about revisions to Asset4 scores (Berg et al. 2020), we re-estimate our models using only data from 2002 to 2016, a period for which scores are considered stable (Table 8). This test directly addresses potential measurement noise arising from retrospective changes in the ESG ratings over longer time horizons. The results remain consistent with the baseline

findings: Sustainability does not significantly affect ROE but is positively associated with the cost of equity across all specifications. More generally, to the extent that sustainability measures are subject to measurement error, as is common with ESG ratings, our estimates are likely to be biased toward zero. This implies that the absence of a significant effect on ROE should be interpreted cautiously, as it may reflect attenuation rather than the absence of an underlying relationship. At the same time, the positive association observed for the cost of equity may represent a conservative estimate of the effect of sustainability on investor risk perception.

Second, we perform subsample analyses to account for potential sample composition effects. Given the relatively large share of US firms in our dataset, we re-estimate the models excluding US observations to verify that the results are not driven by country-specific dynamics (Alatawi et al. 2023). Similarly, we exclude firms in the travel and tourism segment, the most represented industry in the sample, to ensure that our findings are not disproportionately influenced by a single industry. In both

TABLE 8 | Analysis based on the aggregate scores and on the period 2002–2016.

Variable	(21) ROE	(22) ROE	(23) ROE	(24) Re	(25) Re	(26) Re
Roe ($t-1$)	0.226*** [0.064]	0.222*** [0.064]	0.227*** [0.065]			
Re ($t-1$)				-0.193*** [0.027]	-0.187*** [0.028]	-0.190*** [0.027]
SustScore ($t-1$)	0.022 [0.036]			0.147*** [0.050]		
EnScore ($t-1$)		0.051 [0.031]			0.104** [0.047]	
SoScore ($t-1$)			-0.016 [0.032]			0.123*** [0.040]
CSRDisc ($t-1$)	0.011 [0.013]	0.008 [0.013]	0.015 [0.013]	-0.002 [0.015]	0.002 [0.016]	0.004 [0.015]
LogMV ($t-1$)	-0.017 [0.023]	-0.020 [0.022]	-0.016 [0.025]	-0.034* [0.019]	-0.023 [0.018]	-0.033* [0.020]
DebtRatio ($t-1$)	0.012 [0.084]	0.005 [0.083]	0.016 [0.083]	0.280*** [0.078]	0.313*** [0.079]	0.290*** [0.076]
MTBV ($t-1$)	0.019* [0.010]	0.020** [0.010]	0.019* [0.010]	0.001 [0.003]	0.000 [0.003]	0.001 [0.003]
Constant	0.391 [0.503]	0.444 [0.482]	0.385 [0.532]	0.876** [0.406]	0.651* [0.391]	0.852** [0.426]
N	1270	1270	1270	1270	1270	1270

Note: GMM estimates of the model in Equation (1). The dependent variable is either ROE or the cost of equity. For variable definitions, see Subsection 3.2. All independent variables are lagged. Cluster robust standard errors in brackets.

* $p<0.10$.

** $p<0.05$.

*** $p<0.01$.

TABLE 9 | Additional robustness checks.

Panel A						
Dynamic models—without US firms						
	(27)	(28)	(29)	(30)	(31)	(32)
Variable	Roe	Roe	Roe	Re	Re	Re
Roe ($t-1$)	0.222*** [0.077]	0.222*** [0.078]	0.222*** [0.076]			
Re ($t-1$)				0.160*** [0.049]	0.178*** [0.047]	0.162*** [0.045]
SustScore ($t-1$)	0.007 [0.058]			0.069*** [0.018]		
EnScore ($t-1$)		0.015 [0.048]			0.044*** [0.017]	
SoScore ($t-1$)			−0.014 [0.048]			0.059*** [0.015]
CSRDisc ($t-1$)	−0.011 [0.016]	−0.011 [0.017]	−0.009 [0.015]	0.006 [0.006]	0.009 [0.006]	0.010* [0.006]
LogMV ($t-1$)	0.013 [0.029]	0.012 [0.030]	0.013 [0.027]	−0.007 [0.005]	−0.009* [0.005]	−0.007 [0.004]
DebtRatio ($t-1$)	−0.147 [0.106]	−0.148 [0.110]	−0.146 [0.099]	−0.023 [0.018]	−0.027 [0.019]	−0.025 [0.017]
MTBV ($t-1$)	−0.007 [0.011]	−0.007 [0.011]	−0.008 [0.011]	0.003 [0.002]	0.003 [0.002]	0.002 [0.002]
Constant	−0.105 [0.636]	−0.103 [0.655]	−0.111 [0.584]	0.227** [0.100]	0.278*** [0.103]	0.220** [0.094]
<i>N</i>	1295	1295	1295	1295	1295	1295

Panel B						
Dynamic models—without firms belonging to travel & tourism industry						
	(33)	(34)	(35)	(36)	(37)	(38)
Variable	Roe	Roe	Roe	Re	Re	Re
Roe ($t-1$)	0.185*** [0.064]	0.183*** [0.063]	0.186*** [0.066]			
Re ($t-1$)				0.225*** [0.055]	0.234*** [0.054]	0.229*** [0.054]
SustScore ($t-1$)	0.045 [0.057]			0.037*** [0.015]		
EnScore ($t-1$)		0.045 [0.047]			0.023* [0.013]	
SoScore ($t-1$)			0.018 [0.045]			0.032*** [0.012]

(Continues)

TABLE 9 | (Continued)

Panel B						
Dynamic models—without firms belonging to travel & tourism industry						
	(33)	(34)	(35)	(36)	(37)	(38)
Variable	Roe	Roe	Roe	Re	Re	Re
CSRDisc ($t-1$)	−0.006 [0.014]	−0.008 [0.013]	−0.003 [0.013]	−0.003 [0.005]	−0.002 [0.005]	−0.000 [0.004]
LogMV ($t-1$)	0.009 [0.029]	0.008 [0.029]	0.012 [0.028]	0.012** [0.005]	0.012** [0.005]	0.012** [0.005]
DebtRatio ($t-1$)	−0.081 [0.109]	−0.084 [0.109]	−0.079 [0.109]	0.009 [0.016]	0.008 [0.016]	0.011 [0.016]
MTBV ($t-1$)	0.010 [0.012]	0.010 [0.012]	0.010 [0.012]	−0.000 [0.001]	−0.000 [0.001]	−0.000 [0.001]
Constant	−0.145 [0.639]	−0.116 [0.640]	−0.200 [0.621]	−0.191* [0.104]	−0.190* [0.101]	−0.201* [0.109]
<i>N</i>	1182	1182	1182	1182	1182	1182
Panel C						
Fixed effects						
	(39)	(40)	(41)	(42)	(43)	(44)
Variable	Roe	Roe	Roe	Re	Re	Re
SustScore ($t-1$)	0.000 [0.043]			0.014* [0.008]		
EnScore ($t-1$)		0.022 [0.033]			0.015** [0.007]	
SoScore ($t-1$)			−0.030 [0.036]			0.004 [0.007]
CSRDisc ($t-1$)	−0.010 [0.013]	−0.013 [0.014]	−0.008 [0.013]	−0.000 [0.002]	−0.001 [0.002]	0.001 [0.002]
LogMV ($t-1$)	0.019 [0.016]	0.018 [0.016]	0.019 [0.016]	−0.000 [0.003]	−0.000 [0.003]	0.000 [0.003]
DebtRatio ($t-1$)	−0.184*** [0.057]	−0.190*** [0.057]	−0.179*** [0.057]	0.025*** [0.009]	0.023*** [0.009]	0.027*** [0.009]
MTBV ($t-1$)	0.035*** [0.007]	0.035*** [0.007]	0.035*** [0.007]	0.000 [0.001]	0.000 [0.001]	0.000 [0.001]
Constant	−0.495 [0.367]	−0.485 [0.370]	−0.483 [0.365]	0.067 [0.059]	0.074 [0.059]	0.065 [0.059]
<i>N</i>	1626	1626	1626	1626	1626	1626

Note: GMM estimates of the model in Equation (1). The dependent variable is either ROE or the cost of equity. For variable definitions, see Subsection 3.2. All independent variables are lagged. Cluster robust standard errors in brackets.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

cases, the results remain qualitatively unchanged (Table 9A,B), suggesting that our conclusions are robust to alternative sample definitions.

Third, we complement the dynamic GMM estimations with fixed-effects models as a methodological benchmark (Lee et al. 2023). This comparison allows us to assess whether the results are sensitive to the estimation approach and to verify that the main findings are not driven by the use of internal instruments. The consistency of results across methods (Table 9C) further strengthens the robustness of our conclusions.

Overall, the evidence consistently indicates that sustainability does not have a statistically significant effect on short-term accounting profitability but is associated with a higher cost of equity. These findings provide empirical support for Hypotheses 2 and 3, suggesting that the impact of sustainability differs across financial dimensions and reflects the coexistence of offsetting effects on profitability and a positive association with perceived risk.

5 | Discussion and Conclusion

This study investigates the relationship between sustainability and CFP in the tourism sector by jointly examining operational profitability (ROE) and investor-required returns (cost of equity). Our results reveal a nuanced pattern: Sustainability has no significant effect on ROE but is positively associated with the cost of equity. These findings indicate that the two mechanisms identified in our framework (value creation and risk perception) do not unfold symmetrically in the short term. In the case of ROE, the delayed benefits of sustainability are counterbalanced by immediate costs. In contrast, for the cost of equity, information asymmetry may heighten concerns about managerial opportunism.

Our first contribution is theoretical. We propose an integrated framework that brings together stakeholder theory, the RBV, legitimacy theory, and agency theory to clarify the mechanisms underlying the sustainability–CFP relationship. From a stakeholder and RBV perspective, sustainability investments are expected to generate relational and capability-based benefits, such as improved reputation, customer loyalty, and organizational capabilities. However, the absence of a significant effect on ROE suggests that, despite upfront costs consistent with agency theory, these benefits do not materialize in the short term in terms of accounting profitability. Consistent with prior research (Franco et al. 2020), our findings indicate that, in the tourism sector, stakeholder-related advantages and capability development require time to affect financial outcomes. From a legitimacy perspective, sustainability should improve firms' social acceptance and limit exposure to reputational and regulatory risks. At the same time, agency theory offers an alternative interpretation, whereby sustainability initiatives may increase perceived risk if investors view them as potentially self-serving managerial actions. Our results show that sustainability is associated with a higher cost of equity as information asymmetry plays a dual role: It can undermine the credibility of sustainability signals (e.g., greenwashing concerns) while reinforcing investor concerns about managerial opportunism. This

mechanism is particularly relevant for tourism firms operating in high-uncertainty environments driven by macroeconomic shocks, environmental pressures, and volatile demand. Such uncertainty is further reinforced by the central role of intangible assets, such as brand and customer experience, which are difficult to assess. Moreover, in listed firms, the separation between ownership and control may be pronounced, further amplifying information asymmetries and investor concerns.

Our second contribution is empirical: We provide evidence of an asymmetric effect across two distinct dimensions of financial performance, identified through an EVA-based perspective that allows us to jointly consider value creation and risk perception. By disentangling these dimensions, we highlight the importance of multidimensional approaches to financial performance and help reconcile the mixed and inconclusive evidence in the tourism literature (e.g., Lee and Park 2009; Alatawi et al. 2023), by showing that sustainability may simultaneously fail to affect accounting returns while increasing financing costs.

Our findings have important implications for managers and policymakers, as they indicate that sustainability investments may be penalized by capital markets in the short term. Managers therefore face a dual challenge: Although sustainability may be strategically necessary, it may also increase the cost of equity if investors do not properly understand it. This implies that firms should complement sustainability investments with targeted communication strategies to reduce investor uncertainty. In particular, firms should explicitly link sustainability initiatives to financial material outcomes, such as risk mitigation, cost savings, revenue stability, or long-term cash-flow generation, that can be incorporated into investors' valuation models. Greater transparency through more granular reporting (e.g., project-level impacts, timelines, and risk-mitigation effects) may help reduce information asymmetries and limit increases in the cost of equity. Importantly, these implications may also vary across tourism industries. Given our evidence that sustainability is associated with a higher cost of equity, the magnitude and nature of this effect are likely to depend on industry characteristics. For instance, capital-intensive industries such as airlines may face stronger short-term cost pressures and greater sensitivity to capital market perceptions, potentially amplifying the increase in the cost of equity. In contrast, service-oriented segments such as hotels may benefit more directly from reputational gains associated with sustainability initiatives, which may partially offset adverse market reactions. This suggests that the financial implications of sustainability are context-dependent and should be interpreted in light of industry-specific characteristics.

From a policy perspective, our findings suggest that sustainability investments may impose short-term financial burdens on firms by increasing their cost of equity. This leads to a misalignment between private financial incentives and broader societal benefits, suggesting a potential market failure in the pricing of sustainability investments. Policymakers should therefore consider targeted interventions to reduce the financial risks associated with sustainability investments. These may include sustainability-linked financing schemes, guarantees, or tax incentives designed to lower firms' cost of equity. In parallel, regulatory initiatives such as the EU Taxonomy and the Corporate Sustainability Reporting Directive (CSRD) may help

reduce information asymmetries by enhancing the transparency and standardization of sustainability-related disclosures. Importantly, such instruments may need to account for heterogeneity across tourism subsectors (e.g., airlines vs. hotels), given differences in capital intensity, regulatory exposure, and environmental impact.

This study is subject to some limitations. First, our focus on publicly listed firms, where the separation between ownership and control tends to be more pronounced, may influence the extent to which information asymmetries shape investors' perceptions of sustainability-related risk. Although this setting is consistent with the EVA approach adopted to examine the two core mechanisms of our framework (value creation and risk perception), it may limit the generalizability of our findings to the broader tourism sector, which includes many privately held firms with different governance structures and information environments. Future research could extend the analysis to nonlisted firms to assess whether similar dynamics emerge in contexts where information asymmetry may differ in both nature and extent. Second, the sustainability–CFP relationship is inherently dynamic. Although our framework captures both short-term and longer term effects, it may not fully reflect the temporal processes through which sustainability investments translate into profitability, risk, and investor perceptions. Future research could investigate these dynamics using alternative longitudinal designs and nonlinear or threshold models to assess whether sustainability effects materialize only beyond certain intensity thresholds. In addition, future research could broaden the set of variables considered and extend the modeling approach. Scholars could examine additional performance and risk indicators, such as credit spreads or the cost of debt, to further explore the valuation and financing implications of sustainability. Moreover, qualitative or mixed-method approaches could complement large-sample evidence by providing deeper insights into the organizational and strategic mechanisms, including information asymmetry, managerial discretion, and capability development, through which sustainability initiatives translate into profitability, risk, and investor perceptions. Third, although we employ a dynamic system GMM estimator to address simultaneity, unobserved heterogeneity, and reverse causality, endogeneity concerns cannot be entirely ruled out. In particular, the sustainability–CFP relationship may give rise to forward-looking behavior and unobserved factors, such as managerial preferences or firm culture, that are not fully captured by lagged instruments. Although our dynamic specification, rich set of controls, and diagnostic tests help mitigate these concerns, future research could further strengthen causal identification by exploiting quasiexperimental settings, regulatory or policy-induced shocks, or instrumental variables based on exogenous sustainability mandates. Fourth, our reliance on Asset4 sustainability scores may introduce measurement error and coverage limitations. ESG ratings vary across providers due to differences in data availability, disclosure practices, and methodologies, and Asset4 coverage is skewed toward large, listed firms in developed markets. Future research could address these issues by triangulating multiple ESG data sources, further disaggregating sustainability dimensions, or combining ratings with firm-level disclosures. Finally, future research could explore heterogeneity across tourism industries to better understand how industry-specific characteristics shape the sustainability–CFP relationship.

Author Contributions

Rebecca Levy Orelli: conceptualization, investigation, methodology, writing – original draft. **Pierpaolo Pattitoni:** conceptualization, investigation, writing – original draft, methodology, writing – review and editing, data curation, formal analysis. **Barbara Petracci:** conceptualization, investigation, writing – original draft, writing – review and editing, methodology, formal analysis, data curation. **Laura Vici:** conceptualization, investigation, writing – original draft, writing – review and editing, formal analysis, methodology, data curation.

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Ethics Statement

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data used and analyzed for the current study are available upon request.

Endnotes

¹ http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#International.

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Appendix

TABLE A1 | Variable description.

Variables	Description
ROE	It is the return on equity, a measure of a company's financial performance and is calculated by dividing net income by shareholders' equity.
Re	It is the cost of equity capital that is the return that a company requires for an investment or project, or the return that an individual requires for an equity investment.
SustScore	Following Waddock and Graves (1997), Hillman and Keim (2001), Ioannou and Serafeim (2012), Lys et al. (2015) we create a composite sustainability performance score by assigning equal importance (and thus equal weight) to the performance on environmental and social dimensions of sustainability.
EnScore	It is the weighted average relative rating of a company based on the reported environmental information and the resulting three environmental category scores.
Eners	It measures a company's commitment and effectiveness toward reducing environmental emission in the production and operational processes.
Enpis	It reflects a company's capacity to reduce the environmental costs and burdens for its customers, and thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.
Enrrs	It reflects a company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management.
SoScore	It is the weighted average relative rating of a company based on the reported social information and the resulting four social category scores.
Soprs	It reflects a company's capacity to produce quality goods and services integrating the customer's health and safety, integrity and data privacy.
Socos	It measures the company's commitment toward being a good citizen, protecting public health and respecting business ethics.
Sohrs	It measures a company's effectiveness toward respecting the fundamental human rights' conventions.
Sowos	It measures a company's effectiveness toward job satisfaction, healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce.
CSRDisc	It is a dummy variable equal to 1 for firms that publish a separate CSR/H&S/Sustainability report or publish a section in their annual report on CSR/H&S/Sustainability and 0 otherwise.
LogMV	It is the natural logarithm of the market value of equity.
DebtRatio	It is the total debt to total assets ratio.
MTBV	It is the market-to-book ratio.

TABLE A2 | Correlation matrix.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
ROE (1)	1															
Re (2)	-0.01	1														
SustScore (3)	-0.09***	0.23***	1													
EnvScore (4)	-0.09***	0.19***	0.95***	1												
Ener (5)	-0.13***	0.21***	0.88***	0.93***	1											
Enpi (6)	-0.06***	0.03	0.46***	0.48***	0.38***	1										
Enrr (7)	-0.06**	0.16***	0.90***	0.94***	0.78***	0.39***	1									
SoScore (8)	-0.08***	0.25***	0.93***	0.78***	0.71***	0.38***	0.75***	1								
Soprs (9)	-0.04	0.07***	0.71***	0.56***	0.49***	0.29***	0.55***	0.81***	1							
Socos (10)	-0.02	0.37***	0.63***	0.51***	0.48***	0.23***	0.49***	0.69***	0.35***	1						
Sohrs (11)	-0.11***	0.19***	0.73***	0.64***	0.60***	0.40***	0.60***	0.73***	0.43***	0.43***	1					
Sowos (12)	-0.07***	0.22***	0.81***	0.72***	0.69***	0.27***	0.68***	0.81***	0.53***	0.46***	0.52***	1				
CSRDisc (13)	-0.10***	0.04*	0.67***	0.68***	0.66***	0.33***	0.62***	0.58***	0.46***	0.30***	0.48***	0.56***	1			
LogMV (14)	0.16***	0.01	0.24***	0.27***	0.25***	0.20***	0.24***	0.17***	0.09***	0.17***	0.17***	0.14***	0.16***	1		
DebtRatio (15)	-0.41***	0.07***	0.13***	0.15***	0.18***	0.11***	0.13***	0.10***	0.09***	0.05**	0.12***	0.06**	0.15***	-0.19***	1	
MTBV (16)	0.46***	0.10***	-0.07***	-0.10***	-0.14***	-0.04*	-0.07***	-0.04	-0.06**	0.06**	-0.04	-0.04*	-0.12***	0.15***	-0.45***	1

* $p < 0.10$.** $p < 0.05$.*** $p < 0.01$.