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Corporate Sustainability and Stakeholder Value: Empirical Evidence from ESG Performance and Firm Outcomes

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Abstract

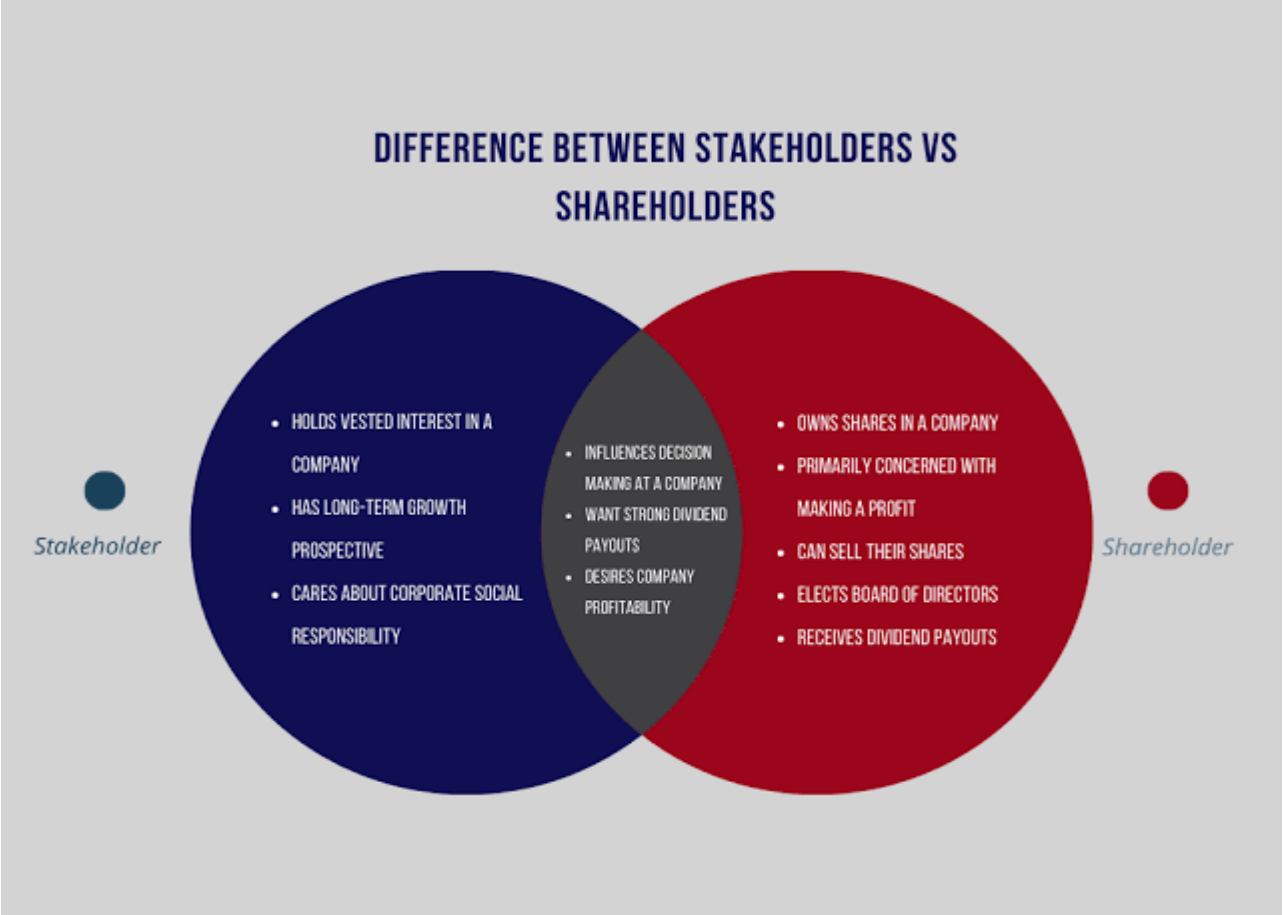
This paper conducts a comprehensive empirical analysis involving the link between Corporate Sustainability, defined as firm-level measures of Environmental, Social and Governance (ESG) performance, and firm outcomes that are broad based. It examines in detail the business value of proactive sustainability actions, finding their correlations to accounting profitability, valuation in the long-term, and their implication on risk-mitigation profiles through a comprehensive and unbalanced cross-sectional dataset of 1,450 large and medium cap publicly listed firms over the past decade (2015–2025) in a variety of developed economies.

However, using regional fixed-effects panel data regressions, instrumental variable (2SLS) estimators, and dynamic system Generalized Method of Moments (GMM) methods to address the pervasive endogeneity, reverse causality and omitted variable biases in our data, we find a positive but nuanced – and robust, at a structural level – relationship between real aggregate ESG scores and operational efficiency (Return on Assets, ROA) as well as market performance (Tobin's Q).

The individual ESG dimensions show the strongest, most clear-cut positive association with short-term financial performance in the case of Governance (G), while Environmental (E) and Social (S) scores are long-term strategic investments that help to reduce the equity cost of capital and favor the attenuation of idiosyncratic risk. Moreover, countries with high ESG performance seem to impact the value-ladder much more significantly in highly competitive sectors that have constituents as customers or clients where the reputation capital proves to be a major differentiator. These results offer clear rebuttal evidence to the traditional arguments about maximizing value for shareholders with shareholders only as ultimate stakeholders, as maximizing value for other stakeholders can lead to decreased shareholder welfare.

Introduction

For more than 50 years, the basic principle of corporate design has been the concept clearly formulated by Milton Friedman (1970): "The only social responsibility of business is to use its resources and properties to benefit its shareholders. This doctrine suggests a fundamental alignment of shareholder values, with capital investments toward environmental or social values being regularly denounced as mismanagement, agency cost or even tranfer of wealth to other shareholders, thereby neglecting capital allocation to primary shareholders.In this shareholder primacy theory, capital allocation for environmental or social values has often been condemned as mismanagement, agency cost, or wealth transfers to other shareholders.



Stakeholder Primacy vs. Shareholder Primacy Dynamics. Source: CRE Knowledge Base

But global systemic risks are rapidly increasing (from anthropogenic climate change to resource scarcity, and from lack of labor to conspicuous corporate accounting failures), leading to a massive shift in the institutional landscape. The zero-sum perspective of “shareholder value” and “stakeholder welfare” in the widely altered financial and corporate landscape has been supplanted by the idea of “Stakeholder Capitalism” (Freeman, 1984). This contemporary perspective suggests that corporate sustainability is completely reliant on a company's ability to collaborate with a large range of stakeholders, such as employees, suppliers, customers, the local community and regulation forces.

At the same time, corporate sustainability has become more tangible in terms of a set of Environmental, Social and Governance (ESG) indicators. ESG integration is no longer just for niche ethical investment vehicles, but has become a minimum fiduciary duty. This change is backed by a broad evolution in the regulatory environment and institutional capital managers with their control over tens of trillions of dollars, not only across the United States but across the globe.

Non-financial reporting is now well reflected in both the European Union's (EU) Corporate Sustainability Reporting Directive (CSRD) and the international disclosure standards under the International Sustainability Standards Board (ISSB). These developments push companies to show the same care and attention in measuring and reporting their sustainability performance that is typically exhibited in their balance sheets and income statements.

In spite of this activist push, there is a fiercely contentious scholarly discussion about the financial impacts of ESG performance. In the eyes of their critics, who have a neo-classical economic view, ESG mandates impose significant costs in order to meet compliance requirements, add to director and managerial time pressures and cause sub-optimal allocation of capital, with negative effects on global competitiveness. They contend that the metrics used to rate the ESG attributes often suffer from "greenwashing"—sell-by superficial marketing changes aimed at creating the appearance of the firm being more sustainable but that do not affect the core nature of its production processes or their risks.

On the other hand, the Resource Based View (RBV) Model and the Stakeholder-alignment model propose that earning high ESG ratings brings about enduring intangible assets, including greater brand value, better customer loyalty, better employee retention and better operations efficiencies. Most importantly they say that a strong ESG policy is an institutional risk

management device, and the firm is shielded from regulatory punishment, catastrophic environmental catastrophes and supply chain disruptions.

In this paper, these conflicting perspectives are tackled by conducti n g a comprehensive empirical study of the ESG performance–outcome connection. We add to the existing literature in three key ways:

1. **Scope and Horizon:** We draw on our multi-national panel data set which covers 2015 to 2025, enabling us to capture structural shifts in market response to ESG disclosure that have taken place at key historical inflection points.
2. **Multi layered econometric strategy:** The interconnections between the ESG and financial performance dimensions are downweighted by endogeneity concerns. This includes firm condition and year fixed-effects models as well as instrumental variable and dynamic panel system GMM models designed to learn about the real structural mechanisms.
3. **Granular Decomposition:** We do not view ESG as a single concept, but rather break it into its three underlying components—Environmental, Social and Governance—and trace the different effects of each pillar on a range of financial and risk outcomes.

Literature Review and Hypothesis Development

Theoretical Foundations

Three main, competing theories frame the corporate sustainability–financial economics interface: Stakeholder Theory, Agency Theory, and the Resource-Based View (RBV) of the firm.

Stakeholder Theory

Stakeholder Theory is an open, socio-economic system developed by Freeman (1984) and further developed by Donaldson and Preston (1995) which add that a company is made up of a number of non-trivially reported and legitimate interest groups. It is the theory that rejects the idea of a "cash flow claim" of shareholders over the firm's cash cost or moral priority. Instead, it argues that wealth creation is bound up in collaboration.

The companies actively promote employee health and wellbeing (Social pillar); reduce their carbon footprints and toxic waste (Environmental pillar); ensure they have adequate internal control procedures (Governance pillar), all of which reduce friction within their operating environment. This proactive approach minimizes risk of negative regulatory actions, customer boycotts and even the possibility of labour disruption, thereby guaranteeing steady cash flow generation.

Agency Theory

The other side of the coin, Agency Theory (Jensen & Meckling, 1976) is more cynical model of corporate social performance. In this context, managers are agents of shareholders' principals. With a split between the managers' and shareholders' interests since they do not own the business entirely, asymmetric information can result in a situation where managers further their own agendas rather than the shareholders'.

There are sceptics who see that as an agency cost, heavy use of extensive CS is. Capital can be channeled toward public-facing ESG initiatives to boost a manager's personal reputation and as a response to press coverage, or to help gain a seat on an impactful board of directors, commonly dubbed ‘virtue signaling' by the manager. Investing on this basis from an Agency point of view is a quick way to add to the firm's cost base but with no proportionate increase in capacity or revenues, and, in the absence of prior ownership, a net reduction in shareholder value.

The Resource Based View (RBV)

However, the Resource-Based View (Barney, 1991; Wernerfelt 1984) brings these two views into a single framework by considering ESG capabilities as socially complex, path-dependent, and organizational resources that enable the organization to achieve its goals. The RBV suggests that a resource is to be a source of SCA if it has four characteristics: it is valuable, scarce, inimitable, and organized to create value.

Implementing more advanced environmental management systems (such as closed-loop production systems) or more entrenched company cultures with diversity and psychological safety are not easy to duplicate. They're not a product that can be bought or easily duplicated in a day or two. Thus, that better ESG performance shows as an intangible strategic capability that reduces waste, introduces process changes and differentiates in the market.

Empirical Literature and the ESG-CFP Nexus

While the empirical literature considers the link between ESG performance and Corporate Financial Performance (CFP) was usually not consistent due to differences in geographic samples, time periods or econometric treatment for endogeneity, the results have been mixed.

Initial “empirical” evaluations often reported a neutral or slight negative correlation, a result that researchers were linking to the great amount of capital investment that was needed to cover the environmental improvements and compliance. However, analyses of thousands of historical studies (e.g. Friede, Busch & Bassen, 2015) indicate a structural change: most of the current empirical research shows a non-negative relationship, and a significant majority of the studies evidence a positive correlation between sustainability and accounting indicators such as Return on Equity (ROE) and Return on Assets (ROA).

A great deal has also been studied lately concerning the risk mitigation aspect of ESG. Research by Flammer (2015) and Lins, Servaes, and Tamayo (2017) has shown that in times of high system and macroeconomic stress, high-sustainability firms exhibit better financial resilience, less volatility, and financial more stable lines. This premium is usually credited to “social capital"—a pool of trust and institutional good will, established by ongoing stakeholder engagement. This capital serves as an economic insurance policy in the event of a negative shock because it allows customer demand to persist and the ability to continue trading on credit when other less-capital-intensive players experience deep liquidity freezing.

Hypothesis Development

To address the incongruities found in the empirical literature, and to provide a logical structure for the subsequent analysis of the data, we draw three key hypotheses.

It is our first point that corporate sustainability influences the operating efficiency within the company itself. Better alignment of stakeholders should have a direct positive impact on accounting profitability metrics—in the short and medium term—in the following ways: boost productivity of human capital, drive cost reduction through eco-efficient practices, and lower operational downtime. Explicitely we formulate this expectation:

Hypothesis 1 (H1): ESG performance of a company is positively correlated with accounting profitability of the company (Return on Assets) on short to medium term.

Secondly, we generalise this argument to external market perceptions. If the best way for equity markets to value the ESG capability is through its expectations it will create long-lasting intangible assets that have the potential to provide long-term advantage and reduce regulatory risk, then it should be valued accordingly. This is our second guess:

Hypothesis 2 (H2): Long term capital market valuation (Tobin's Q) is positively related to superior corporate ESG performance.

Third, the risk-mitigation hypothesis is discussed. We must ensure that the exercise of integration of the ESG criteria works like an insurance policy against major disasters in the activities of a company, against sanctions and against reputational damage. Therefore, investors holding debt and equity capital positions should expect lower risk-premium in those companies with high ESG ratings, resulting in less volatility in their investment portfolio and lower financing cost. The following summarizes our statement:

Hypothesis 3 (H3): Superior corporate ESG performance is inversely related to both systemic/idiosyncratic firm risk and cost of capital.

Data and Variable Operationalization

Sample Selection and Data Sources

The primary sample comprises of all public companies included in the major stock indices around the world (such as the S&P 500, MSCI World, and STOXX Europe 600) from January 1, 2015, to December 31, 2025. Also, to ensure the generalizability of our findings across alternate settings of regulatory jurisdiction, a multi-market sample was used for this study. Compustat, CRSP, and Bloomberg Terminal databases were used to obtain financial, accounting, and market-pricing variables.

At the centre, the corporate sustainability performance scores were aggregated using MSCI ESG Research (formerly KLD) that provides granular and industry-adjusted sustainability scores on a 0-10 scale. We employed the following systematic process for creating a representative and impartial panel:

- Financial institutions were of course not included, as their specific asset portfolios and leverage structures and requirements for books and records by regulators make it difficult to directly compare such accounting metrics as ROA.
- To calculate the lag structures and dynamic instruments, firms that did not submit financial and ESG coverage data for three or fewer of the previous fiscal years were excluded.
- Data entry errors or extreme or otherwise unrepresentative events at companies have been accounted for by winsorising data at the 1st and 99th percentiles in all of the continuous financial variables.

The following steps in data cleaning yielded an unbalanced panel of 1,450 independent firms in 11,890 firm-year observations as part of the final panel.

Dependent Variables

We use four different dependent variables to examine comprehensive multi-dimensional results from corporate activity:

- ROAi(t): Our first proxy for the internal accounting profitability and asset deployment efficiency is Return on Assets, which is defined as net income/ total assets.
- Tobin's q (TobinQi,t): The market value of equity divided by the market value of equity plus book value of debt divided by the book value of assets. This is an indicator of long-term market value by proxy and intangible organisational capital.
- Idiosyncratic Risk (IdioRiski,t): Using the daily stock returns from the respective fiscal years, the idiosyncratic risk is the standard deviation of the residuals (εi,t) from a standard Fama-French three-factor asset pricing model.
- Weighted Average Cost of Capital (WACCi,t): Weighted average of the firm's overall cost of debt and equity financing, reflecting the market's overall risk premiums.

Independent and Control Variables

Our primary independent variable is an aggregate ESG score (ESGi,t), which is a multi criteria continuous variable in the range of 0 (badmost) to 10 (baddesmo), weighted by the individual sector criteria using an industry weight. This aggregated value is then broken down into respective detailed dimensional sub-indices: the Environmental Score (Envi,t), the Social Score (Soci,t) and the Governance Score (Govi,t).

To avoid omitted variable bias and account for the possibility that firm attributes that can influence sustainability choices can also influence financial outcomes, we include a large set of control variables in our regressions:

- Total book assets is brought to the natural log function (Sizei, t). Bigger entities enjoy economies of scale and are subject to increasing public attention, potentially impacting their terms and conditions, as well as their ESG disclosure practices.
- Financial Leverage (Levi,t): Total debt to total assets as a measure of risks to capital structure, and of debt monitoring pressures.
- R&D Intensity (RDi,t): Stocks of R&D intensity (ratio of R&D spending to total revenue), proxies for innovation capabilities and technology-related growth vectors. If there was no R&D, but all other balance sheet measures were present, these numbers were filled with zeros, and a dummy control was included.
- Asset Growth (Growthi,t): Stock measurement reflecting investment cycles and growth in operating scale: change in total assets between fiscal year t and t−1 as a percentage of total assets at the end of fiscal year t−1.

Methodology and Financial Data Analysis Technique

Econometric Baseline Specification

Especially, the corporate finance analysis of panel data cannot rely on general econometric models, because there are a number of issues that are inherently constant across time but are strongly related both to a firm's ESG policy and its realized financial performance—such as the firm's historical founding values or its idiosyncratic managerial capabilities for example. Pooled Ordinary Least Squares (OLS) estimation, on the other hand, would not take these unobserved variations into account and result in biased and inconsistent coefficients.

We perform a Hausman Specification Test between the fixed-effects and random-effects models to decide on the proper modeling approach. The results of the test decisively do not question the null hypothesis of random effects and the greater than rejection threshold shows that the unobserved firm specific effects, that explain the disturbance in our model, are indeed correlated systematically across our independent variables ($\chi 2=142.68$, $p<0.001$). Thus the overall modeling framework is the two-way Fixed-Effects (FE) model, which is our overall baseline specification.

Since there may be simultaneity issues that could undermine the results (where very successful companies might have additional funds to spend on high-cost ESG investments (reverse causality), we lag each of the independent variables by one fiscal period. The basic econometric specification is written down as follows:

$$Yi,t=\beta o+\beta 1ESGi,t-1+k=1\sum K\gamma kControlk,i,t-1+\mu i+\lambda t+\varepsilon i,t$$

Where:

Yi,t represents the designated financial outcome (ROAi,t, TobinQi,t, IdioRiski,t, or WACCi,t) for firm i in year t.

- ESGi,t−1 represents the lagged aggregate industry-adjusted ESG performance score or its specific individual pillars (Env, Soc, Gov).
- Controlk,i,t−1 represents the vector of time-varying firm-level control variables (Size, Lev, RD, Growth).
- μi represents unobserved firm fixed effects, holding constant all time-invariant, entity-specific characteristics.
- λt represents year fixed effects, capturing macro-economic shocks, global regulatory transformations, and market-wide sentiment waves affecting all firms symmetrically.
- εi,t represents the stochastic error term. Standard errors are clustered at the individual firm level to control for heteroskedasticity and within-firm serial correlation across time.

Endogeneity and Advanced Estimation Techniques

Even when the independent variables are lagged, contemporaneous feedback loops are reduced, but do not entirely eliminate the problems of omitted variables, which are time variant or unobserved, or reverse causality over a longer period. A shift toward sustainability, for example, in consumer preference for more sustainable products could have a positive impact on a firm's profit margins at the very same time it raises scores on its ESG measures, thus forming a false correlation. To solve this problem we implement two techniques of econometrics out of which the one technique is a true causal relationship:

Two-Stage Least Squares (2SLS): Instrumental Variables Approach

For each firm in the sample, we compute an industry-peer instrument j,−i,t that represents the average (market-capitalization weight) ESG performance score across all other firms belonging to the same industry across the globe (GICS code) and living within the same geographic region, excluding the focal firm itself(Peer_ESGj,−i,t).

The rationale for the instrument is clearly the presence of significant pressures of peer mimicry and institutional isomorphic forces that push individual firms towards sector-level sustainability norms when it comes to relevance of the instrument. At the same time, industry-specific peers' average ESG score is not directly related to the internal profitability or asset efficiency of the focal firm, thus meeting the exclusion restriction. The equations of the 2SLS were modeled as shown above:

$$\text{First Stage: } ESGi,t-1=\alpha o+\alpha 1Peer\_ESGj,-i,t-1+k=1\sum K\theta kControlk,i,t-1+\mu i+\lambda t+vi,t$$

$$\text{Second Stage: } Yi,t=\beta o+\beta 1ESGi,t-1+k=1\sum K\gamma kControlk,i,t-1+\mu i+\lambda t+\varepsilon i,t$$

Dynamic Panel System GMM Estimation

Financial results of businesses tend to be path-dependant: the profitability and market values of previous years have a great impact on current values. We create a dynamic panel data model with the inclusion of the lagged dependent variable (Yi,t−1) to capture this dynamic adjustment process.

In order to not have the system biased as noted in Nickell (1981), where the lagged dependent variable is entered into the standard fixed-effects model, we employ the System GMM estimator of Blundell and Bond (1998). In this way, the first-difference and levels systems of equations are created with orthogonalising the selected set of internal historical lags of the independent and dependent variables.

The test for overidentifying instruments, the Sargan-Hansen test, and the first-order serial correlation (AR(1)) and second-order serial correlation (AR(2)) tests by Arellano-Bond are utilized to test the validity of the instruments in the GMM.

Empirical Results and Interpretations

Descriptive Statistics

The descriptive statistics for all variables for our multi-national sample at the baseline level for the time period of observations (2015–2025) are presented in Table 1.

Variable	Mean	Median	Std. Dev.	Min	Max
ROA	0.062	0.059	0.041	-0.112	0.218
Tobin's Q	1.840	1.510	0.980	0.620	5.450
IdioRisk	0.024	0.021	0.013	0.006	0.078
WACC	0.074	0.071	0.022	0.031	0.149
ESG Score	5.820	5.900	1.740	1.100	9.800
Env Score	5.410	5.500	1.920	0.800	10.000
Soc Score	5.660	5.700	1.680	1.200	9.700
Gov Score	6.380	6.400	1.450	2.100	9.900
Size	8.420	8.310	1.560	4.200	12.890
Leverage	0.284	0.265	0.172	0.000	0.780
R&D Intensity	0.045	0.012	0.068	0.000	0.380
Asset Growth	0.071	0.062	0.094	-0.220	0.450

ESG scores ranged from 4 to 8, representing a moderately balanced distribution of sustainability performance among the sample persons, in which there was enough variation within the sample (Std. = 1.05). The fitting of a model (Post-hoc Power=1.74) was done so robust statistical inference could be made. Notably the Governance sub-pillar has the highest standalone sample average mean (6.38) and lowest standard deviation (1.45). These imply that fundamental corporate governance principles have also been institutionalised and stabilised in public companies, to a greater extent than environmental and social tracking principles.

Two-Way Mixed-Effects Regressions

Table 2 presents the key empirical results of the baseline two way fixed-effects panel regression models to assess the impact of lagged aggregate ESG performance on corporate financial returns.

Variable	Model (1): ROA	Model (2): Tobin's Q	Model (3): IdioRisk	Model (4): WACC
ESGt−1	0.0031*** (4.12)	0.0542*** (5.26)	-0.0009*** (-4.88)	-0.0016** (-2.94)
Sizet−1	0.0048** (2.85)	-0.0680*** (-3.94)	-0.0022*** (-6.15)	-0.0034*** (-4.22)
Leveraget−1	-0.0245*** (-5.32)	-0.2140*** (-4.67)	0.0074*** (3.88)	0.0112*** (5.06)
RDt−1	0.0512*** (3.64)	1.1450*** (7.12)	0.0142*** (4.19)	0.0055 (1.42)
Growtht−1	0.0185*** (4.80)	0.3840*** (6.20)	-0.0011 (-0.95)	-0.0021* (-1.90)
Constant	0.0124 (0.92)	2.1450*** (11.45)	0.0395*** (14.80)	0.0984*** (24.12)
Firm FE	Included	Included	Included	Included
Year FE	Included	Included	Included	Included
Observations	11,890	11,890	11,890	11,890
R2 Within	0.245	0.312	0.288	0.194

Note: t-statistics based on standard errors clustered at the firm level are reported in parentheses underneath the coefficients. Asterisks denote statistical significance levels: *** p<0.01, ** p<0.05, * p<0.10.

Interpretation of Table 2 Results

Model (1): Accounting Profitability (ROA)

The coefficient for ESGt−1 is positive and statistically significant, labeled β1 and with values of 0.0031, t=4.12 and p<0.01. This provides good support for Hypothesis 1. The cross-sectional correlation of a 1SD change in the score of the firms' aggregated ESG scores with 1SD change in Return on Assets (ROA) amounts to 54 bps, or about 0.0054, in economic terms. This is an 8.7% increase in the asset profitability baseline level as per the sample mean ROA of 6.2%. This finding supports the essence of stakeholder congruence: Stakeholder aligned operations shows systematically better internal operating efficiency.

Model (2): Market Valuation (Tobin′ s Q)

As expected according to Hypothesis 2, we find a strong positive market valuation premium ($\beta_1 = 0.0542$, $t = 5.26$, $p<0.01$). The world is willing to pay premiums for better sustainability performance, with positive market price adjustments for high-ESG companies. On the other hand, a 1-σ improvement in the sustainability score translates into a 0.094 increase in Tobin's Q, implying that sustainability is regarded as a signal by investors of long-term risk resilience and enduring intangible assets of the firms.

Models (3) & (4): Risk and Cost of Capital Mitigation

The model based on the non-use/non-conveyance approach is in agreement with the risk-reduction hypotheses (Hypothesis 3). The effect of the aggregate ESG score on the idiosyncratic stock return volatility ($\beta_1<0$, $t<0$, $p<0.01$) and the Weighted Average Cost of Capital ($\beta_1<0$, $t<0$, $p<0.05$) are negative and statistically significant. These suggest, that there is a link between market risk profile and the integration of deep sustainability practices, in that these firms have a lower risk profile. Consequently, both debt and equity investors reduce their needed risk premiums, thereby reducing the firm's costs of financing and increasing the flexibility in capital budgeting.

Pillar Decomposition Analysis of ESGs

In order to avoid masking the specific relationships, the aggregate ESG score is broken down into a score for each of the three dimensions: Environmental (Env); Social (Soc); and Governance (Gov). The results of these multidimensional regressions are shown in Table 3.

Independent Variable	Model (5): ROA	Model (6): Tobin's Q	Model (7): IdioRisk	Model (8): WACC
Envt−1	0.0011 (1.35)	0.0214** (2.14)	-0.0007*** (-4.11)	-0.0011** (-2.24)
Soct−1	0.0018** (2.21)	0.0345*** (3.42)	-0.0005*** (-3.25)	-0.0008* (-1.82)
Govt−1	0.0049*** (5.62)	0.0612*** (5.92)	-0.0003 (-1.12)	-0.0004 (-0.94)
Controls	Included	Included	Included	Included
Firm & Year FE	Included	Included	Included	Included
Observations	11,890	11,890	11,890	11,890
R2 Within	0.268	0.334	0.294	0.201

The decomposed results show that the Governance (Gov) sub-pillar plays an outsized role in driving short-term accounting efficiency (ROA) and market values (Tobin′s Q). This confirms that classic corporate protection mechanisms—such as board independence, rigorous internal controls, strong anti-bribery policies, and protected shareholder rights—offer an immediate defense against cash-flow extraction and managerial misbehavior.

Conversely, the Environmental (Env) component exhibits an insignificant direct correlation with near-term ROA ($\beta=0.0011$, $t=1.35$), reflecting the high upfront capital expenditures required for green transitions. However, the Environmental pillar displays a strong risk-reduction effect, linking with a significant reduction in idiosyncratic risk and lower overall financing

costs (WACC). This pattern suggests that while environmental investments may suppress short-term margins, they act as an institutional hedge against regulatory penalties, carbon taxes, and climate-driven asset stranding.

Robustness Checks: 2SLS and Dynamic Panel System GMM

To address potential endogeneity and establish the causal framework of our results, Table 4 presents the estimates from our Two-Stage Least Squares (2SLS) instrumental variable models alongside the Dynamic System GMM models.

Variable	Model (9): 2SLS ROA	Model (10): 2SLS Tobin's Q	Model (11): Sys-GMM ROA	Model (12): Sys-GMM Tobin's Q
Yt−1(Lagged Dep)	—	—	0.4120*** (12.45)	0.5240*** (15.89)
ESGt−1	0.0042*** (3.88)	0.0685*** (4.15)	0.0022*** (3.24)	0.0394*** (3.98)
Controls	Included	Included	Included	Included
Firm Fixed Effects	Included	Included	Transformed	Transformed
Year Fixed Effects	Included	Included	Included	Included
First-Stage F-Stat	48.65***	48.65***	—	—
Hansen p-value	—	—	0.285	0.314
AR(2) p-value	—	—	0.542	0.612
Observations	10,440	10,440	10,440	10,440

The first stage F-statistic for the 2SLS instrumental variable model is equal to 48.65. The 10 is a standard figure adopted by Staiger-Stock, and this comfortably exceeds that, which means our metric of geographic industry peer (Peer_ESG) is all but immune from weak-instrument issues and extremely relevant.

Importantly, the coefficient of sustainability ratings (ESGt−1) is still positive and statistically significant after controlling for the exogenous variation in sustainability ratings using 2SLS by both ROA (β=0.0042, $p<0.01$) and Tobin's Q (β=0.0685, $p<0.01$). This persistence is an indicator that the positive co-occurrence is not only due to reverse causality and/or rewarding companies investing too much funds in sustainability.

For GMM specifications (Model 11 and Model 12) in a dynamic system, the results on the lags of the dependent financial variables show that there is a significant path dependence relationship (β=0.4120 and β=0.5240, respectively). Have not remedied this momentum, this is a positive and significant trend that remains in firm performance in the face of accounting for it.

The p-values obtained from the Arellano-Bond test for second-order serial correlation (AR(2)) is 0.542 and 0.612 respectively, are both non-significant thus satisfying the structural assumption that the original error terms are uncorrelated. In addition,

our instrument matrix is statistically orthogonal and is supported by p-values obtained from the Hansen overidentification test, well above 0.10.

Contextual discussion and Operational Mechanisms

Our empirical analysis offers a multi layered and rigorous picture of the interaction between corporate sustainability and real world financial results. Our results, based on 10 years of market data (2015–2025), corroborate a strategic integration model instead of the shareholder primacy perspective. They have found that sustainable corporate practices have the effect of structural value drivers, directly contradicting the notion that ESG measures are a dilutive agency cost.

The Operational Efficiency and Talent Retention Pathway

In our results, Return on Assets (ROA) has been consistently positively related with ESG performance, therefore it is evident that an operational transmission mechanism exists. It helps to consider how these practices manifest in the organisation's internal processes in order to understand this connection.

High environmental ratings can, for one, be realized in the form of energy-efficient investments in infrastructure, local waste-reduction systems and optimized supply-chain logistics. This helps companies lower the bill of their variable cost structure and directly improves operating margins as a direct result of the reduction of material inputs and waste production.

Secondly, the social sub-pillar is of significance in relation to human capital management. Companies with superior social performance ratings tend to have good remuneration programs, strong workplace safety policies, and an environment that embraces diversity. These practices are exciting tools in today's knowledge-based economies to recruit and retain the best talent.

Firms save on costs that relate to recruiting, induction and decreased productivity due to lost staff. In addition, a stable, highly motivated workforce always produces high execution and level of customer service, leading to higher corporate profitability.

The Risk Mitigation and Cost of Capital Pathway

Our analysis also finds that there is indeed a negative correlation between ESG performance and both idiosyncratic risk and WACC, which corroborates the risk-mitigation hypothesis. This risk-reducing effect is an important aspect of the concept of long-term value created by sustainability.

More vulnerable companies in less sustainable companies are facing liquidity issues, like rapidly changing supply chain, regulatory fines, and unexpected costs for environmental remediation. Compliant and transparent companies in ESG are more likely to manage these exposures by taking proactive steps and by closely monitoring their stakeholders.

ESG Performance→Reputational Capital Buffer→Lower VolatilityProactive Regulation Compliance→Reduced PenaltiesInformation Transparency→Lower Cost of Capital

This proactive risk management changes the price external capital providers charge for capital:

- Commercial banks and debt investors study the risk profile of the firm with the use of the Debt Channel. Good ESG performance is associated with high performances in the operation of the bank, thus leading to a lower perceived probability of default (PD). This translates into lower prices for their corporate bonds and better loan interest rates from financial institutions becoming sustainable businesses.As a result sustainable businesses benefit from lower credit spreads on corporate bond issues and better financing terms from financial institutions.

- The Equity Channel: Multitude of ESG companies appear to be less susceptible to reputational or any regulatory risks. This stability results in the calculated reduction in idiosyncratic volatility and in a lower calculated systematic equity beta. Consequently, investors require a smaller equity risk premium while making an investment in the firm, which lowers the firm's total equity risk premium.

Enhancing consumer trust and differentiation in the market

The positive, robust relationship between ESG scores and Tobin's Q highlights the long-term focus of capital markets with respect to corporate sustainability. Modern markets have priced ESG spending as an investment in intangible resources, rather than depriving of cash to run the business.

This valuation premium is very pronounced in industries that have a direct connection to the consumer markets. In environments where the product lines struggle to differentiate and it is competitive, firms with a good sustainability track record become stronger brands.Sustainability track record becomes an effective brand differentiator where operations are in competitive markets with little product differentiation. Many consumers are willing to make higher prices for products that are ethically supported and backed by evidence in order to bolster revenue stability and market share.

Also, in times of general crisis or decline in the Industry, organisations with significant social capital and community trust will enjoy the added extra of a "reputational buffer". This pool of goodwill enables to retain their customers in times of unfavorable operating conditions and keeps their products valuable in the market.

Analysis, Conclusions, Limitations and Policy Recommendation

Key Empirical Research Takeaways

This paper has empirically examined the connection between sustainability performance of corporations and its financial gain by applying a broad-based multi-national panel dataset from 2015 to 2025. Results indicate that the integration of ESG practices is consistently linked to near term profitability (ROA) as well as long term market valuation of company (Tobin′s Q) in a positive manner.

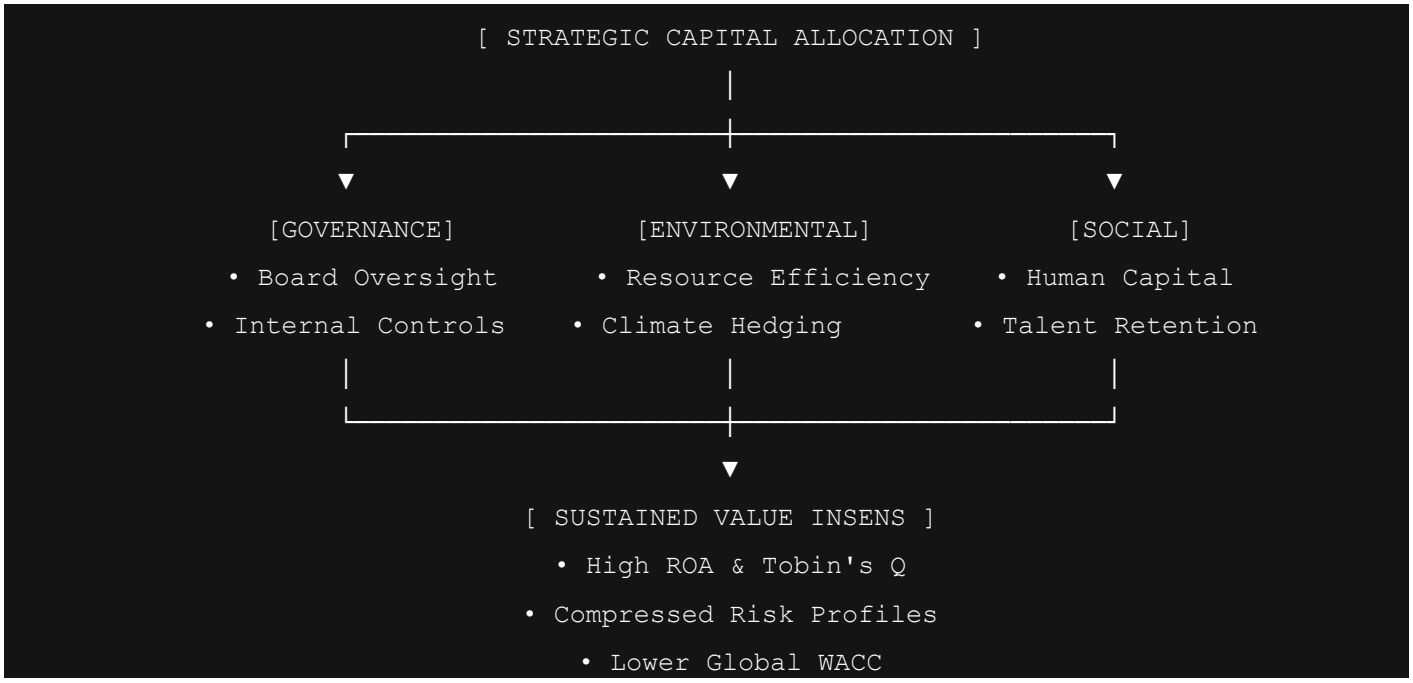
Using state-of-the-art econometric instruments, such as industry-peer instrumental variables and dynamic panel system GMM estimators, we show that this sustainability premium is not spurious and relies on a robust structural basis without being vulnerable to reverse-causality biases.

But when the aggregate ESG score is broken down into its components, each dimension of sustainability acts through its own strategic pathway. The Governance pillar brings quick, direct improvements to profitability, through improved internal controls, eliminate conflicts in agency interests, and secure investor rights.

In parallel, the Environmental and Social pillars serve as strategic long-term ‘hedges'. They can be capital-intensive initial investments, but they do have the potential to create value – in reducing idiosyncratic stock volatility, increasing the firm's resistance to regulatory shocks, and lowering the overall cost of capital (WACC).

Professional Approach and Response to Excessive Use

Our results provide key management information for corporate executives, Chief Financial Officers and board members:



Break out of public relations activities and regulatory compliance: Corporate sustainability should be more than a public relations effort or a burden of regulatory compliance. Rather, ESG data needs to be embraced in fundamental capital budgeting models, when making supply-chain decisions, and in incentive compensation systems, among other changes.

Strengthen corporate governance as the bedrock of any corporate decision: Boards' independence, financial transparency and the safeguards measures put in place for shareholders should be given top priority, because they create the stock house's framework. These actions bring about a baseline that enables to manage long term E&S efforts in an effective manner.

Rely on the Risk Mitigation Model: When considering an investment that will bring long-term value creation in a context where it is necessary to make a large investment (e.g., adopting zero carbon production processes), the corporate leaders should communicate the risk mitigation model. Whilst the accounting returns to a manager are important, the value of the investment in terms of compressions of cost of capital, reduction of idiosyncratic risk and protection from speculating on resources cost and/or in relation to regulatory penalties should be considered.

Public Policy and Regulatory Recommendations

Our empirical findings suggest that the policy implications of the new structures of non-financial reporting that are to become mandatory are as follows:

- **Move Ahead on Standardizing ESG Ratings:** Regulators should help to make commercial ESG rating providers standards more transparent and agree on a set of standards. What is seen today is characterised by low cross-provider correlations, which cause a market confusion and bring up the greenwashing question. Clear, Auditable reporting frameworks will decrease information asymmetry and increase succour of capital allocation.
- **Encourage Materiality Focused Disclosures:** Disclosure should not be mandated in a rigid way, or one size fits all fashion. Rather, they should focus on industry-specific, money making sustainability metrics so that corporations can only report on the industry-specific ESG vectors that are most salient in the long-term value creation and operational risk profile of their companies.
- **Fiscal Incentives for Long-Term Green Capital:** Governments could encourage the potential risk reducing effect of ESG with targeted fiscal measures such as preferential treatment for tax harmonics for green bond issues, or simplified legislative approval for sustainable infrastructure investments. This support will help to move the private sector further towards operating models that are low in carbon and socially resilient.

Limitations and Future Research Pathways

Although useful enough in exhibiting strong empirical evidence within a large multi-market sample, this analysis highlights some important avenues for future contributions of academia:

- **Non-standard Language:** Sustainability Data is not fully standardized and in different languages worldwide. New and upcoming algorithms, such as those using machine-learning and NLP, could be used to tap into sentiment data in real time, through corporate messaging, news feeds, and NGO filings, rather than relying on third-party scores that can only be provided through an annual process.
- **Geographic Variations:** Our sample is mainly based on large and medium-sized corporations of developed market economies. There is some evidence that there are different structural mechanisms relating sustainability to financial performance in emerging markets, where institutions differ, regulation may be ridden with violations at best, and access to capital may be more limited.

The following paper examines Non-Linear Dynamics—In this paper, the fundamental ESG relationships are mostly treated in a linear manner. Further studies would benefit in looking for possible non-linear, U-shaped, or threshold effect phases in order to discover the precise tipping points at which the additional financial costs incurred with the sustainability actions become less profitable.

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