

SUSTAINABLE GOVERNANCE, ESG PERFORMANCE AND FIRM VALUE: A DYNAMIC PANEL-DATA INVESTIGATION OF BRSR-REPORTING FIRMS IN THE INDIAN MANUFACTURING SECTOR

Ruffee¹, Dr. Nameeta Garg²

¹ Department of Business Management and Commerce, Desh Bhagat University, Mandi Gobindgarh, India

² Department of Business Management and Commerce, Desh Bhagat University, Mandi Gobindgarh, India

ABSTRACT

Background: Companies are increasingly aware that sustainability, which has become a key element of corporate decision-making, cannot be separated from post financial outcomes. The comparative nature of sustainability-related information in India has improved with the initiation of the Business Responsibility and Sustainability Reporting ((BRSR)) framework. Nevertheless, a clearer picture of the impact sustainable governance and ESG performance have on firm value is still yet to be determined; with specific focus in the Indian manufacturing sector.

Objective: The major objective of this article is to evaluate the independent relationship between sustainable governance mechanisms & ESG performance as well as whether these outcomes in turn provide crucial value creation through firm value among BRSR-reporting Indian manufacturing firms

Methods: It employs a quantitative longitudinal research design based on 250 firm-year observations (2021–2025) over five years, using a panel of 50 Indian manufacturing firms. This is typically expressed through board independence, board diversity, mentally establishing sustainability oversight and accountability embodied into a Sustainable Governance Index (SGI). Aggregate ESG score and separate environmental, social, and governance dimensions are used to assess ESG performance, while Tobin's Q measures firm value; control variables include firm size, leverage, profitability, and sales growth. We use a dynamic panel-data framework based on System Generalised exclusive Method of Moments (System-GMM) which accounts for persistence in firm value, potential endogeneity, reverse causality and unobserved firm-specific effects.

Results: The early results show that sustainable governance is a positive structural influence on overall ESG performance. The evidence of positive associations between sustainable governance and social or governance performance is stronger than the evidence with environmental performance. Our findings produced in the first analysis (firm-value) of sustainable governance are positively related with Tobin's Q, meaning it has a positive integrated relation to firm value. Aggregate ESG performance, on the other hand, is not contemporaneously predictive of firm value in the working specification. The results indicate that strong ESG performance does not directly lead to greater market cap, and that ESG may indeed be a channel through which sustainable governance affects firm value.

Conclusion: The study suggests that sustainable governance mechanisms may be critical in enhancing ESG-related outcomes and sustained corporate value creation, content likely underpinning India emerging sustainability-reporting environment. It further emphasizes separating ESG disclosure from ESG performance, and it establishes an active framework to analyze the governance–ESG–firm value link with firm-level BRSR, financial and market data.

Keywords: Sustainable Corporate Governance; ESG performance; Corporate Valuation; BRSR Framework; Value Creation

INTRODUCTION

1.1 Background

ESG, Environmental Social and Governance issues are finding their way into the very core of many businesses. Well, given an expanded perspective, broadly speaking Consider the modern-day Accounting Standards that guided decision making data backdated till October 2023 without having FTAs treated in two-dimensional space as big digits numbers play out to impact any bottom line yet so-called (and help pass virtue signal and easy-talk missions on climate action for eons behind). This is major change, particularly for manufacturing (as such activities are usually connected to significant aspects such as resource consumption, emissions and/or waste generation and so on; furthermore, in this context ES&H, supply-chain risks as well as regulatory requirements) corporate governance plays a key role in addressing such issues. The board and senior management identify, monitoring and integrates sustainability issues into the company's" decisions. Board independence, Board diversity, Sustainability role of the board and sustainability-related accountability can help in enabling organisational antecedents to invoke sustainability-related policies. In this regard, sustainable governance may be defined as implementing the actual practice of sustainability, wherein firms reflect the transcendental aspiration of action on sustainability in its operations.

The second event which has attracted significant attention in Indian corporate reporting landscape is the SEBI framework on Business Responsibility and Sustainability Reporting (BRSR). In the case of BRSR, reporting that can be done is more specific, especially in environment, social and governance (ESG) areas. For FY 2021–22 voluntary and thereafter mandatory for the top 1000 listed companies (large market capitalisation) from FY 2022–23 This has made sustainability data more available and shows an important setting for researching the doings of the firms with regard to ESG. However, more availability of ESG information does no better mean that the firms perform well on various ESG indicators. There are two issues in play: Reporting, and actual sustainability performance. One company can get a lot of detail in, but the actual environmental, social or governance performance varies vastly between companies. Therefore, it is important to examine whether governance mechanisms are related to any objective measures of ESG performance and asks whether such performance is associated with firm value.

The QUOTE WHOPPING problem is more relevant in manufacturing space. The manufacturing firm's decisions on sustainability may affect operating cost, compliance of regulation, employee relations, resource efficiency; reputation and long-term business risk. Information related to sustainability risks may be very well incorporate by investors in the assessment of future company performance and risk. As governance is considered to be a key factor influencing both ESG performance (e.g. governance is one of the components of ESG ratings) and firm value, it becomes empirically interesting to examine how this relationship changes over time too! Although some ESG initiatives may have initial outlays associated with them, the benefits that materialise from these investments can take years to be recognised — evident through longer-term returns as a result of better efficiency, superior risk management, enhanced stakeholder confidence and greater resilience. Blonding also exists as firms smooth as they transition between their new value at the firm level and financially stronger firms appear to hang onto their bullishness on ESG. By virtue, therefore, of these features the relationship thus formed is subject to persistence, reverse causality and endogeneity when being tested empirically. Against this backdrop, the current study explores how sustainable governance affects ESG and firm value for Indian manufacturing firms reporting to the BRSR.

1.2 Problem Statement

While sustainable governance through ESG reporting is finding traction in investor conversations in India, the empirical clarity to interlink sustainable governance with ESG performance and firm value appears weak. Although the recent BRSR introduction has improved corporate sustainability disclosures, simply disclosing does not lead to better ESG performance among firms but may affect market price. Accordingly,

the key research questions this study seeks to answer is whether stronger sustainable governance leads to improved ESG performance and if varnished governance along with ESG performance enhances firm value. This challenge becomes more pronounced when these dimensions of ESG are examined separately. Environmental, social and governance (ESG) initiatives can lead to a range of investments, associated risks and anticipated benefits. In the case of S, one example is that while environmental benefits require large investment on greening technologies and resource efficiency in developing industries, social performance is much more related to employee/stakeholder practices. In contrast, governance performance may be more tightly tied to oversight and accountability mechanisms; decision-making structures. So to by grouping together all the three dimension as one we may lost some differences main them. The other thing is that relative relationships shift. Current performance alone does not define firm value and ESG practices do not just spring up from some vacuum away from a firm's historical performance and resources. This suggests that a simple static relationship could prove inadequate. The current study adopts a dynamic panel-data framework to tackle this problem.

1.3 Research Gap

The existing literature is relatively well integrated in combining data on corporate governance, ESG performance and firm value; however, there are significant gaps. Although research has been conducted on the relationship between governance (and ESG) and firm value, three main observations emerge from a review of the previous literature. Few studies integrate these connections and examine whether governance influences ESG performance, or whether ESG performance in turn affects firm valuation. Evidence on India — especially following the passage of BRSR —the Business Responsibility and Sustainability Report, is only beginning to emerge. There are limited indications of how ESG performance and market value may be linked to sustainable governance, as the BRSR framework provides a template for this relatively new reporting environment. Third, many studies were pooled businesses in multiple industries. It may complicate interpretation because sustainability risks and practices can vary widely from sector to sector. Manufacturing companies are different in terms of environmental, social, operational and regulatory standards and thus need to be considered separately. Fourth, most studies only use static regression models. First, these models likely do not adequately factor in the persistence of firm value and ESG performance or that governance, ESG practices and financial performance may interact with one another. A Dynamic panel approach can deal with these issues. Finally, aggregate ESG scores may hide differences across the environmental, social and governance dimensions. This shows why they should examine the three ESG pillars independently and not assume their relationship to firm value is similar. Last, ESG performance as a channel that connects ESG governance quality and firm value has not been widely researched. This allows us to conceptualise ESG as an output variable—as well as a process that could serve as the link between corporate governance and market valuation.

1.4 Objectives of the Study

The aim of this study is:

To explore the relationship between sustainable governance and ESG performance in Indian manufacturing firms reporting BRSR.

To examine the relationship between sustainable governance and value after controlling for important firm level characteristics.

To examine the potential mediating role of ESG performance in the relationship between sustainable governance and firm value.

To explore whether or not environmental, social and governance vary in their effects on firm value.

1.5 Novelty of the Research

This study contributes to the literature by understanding sustainable governance, ESG performance and firm value in a mutual manner. Instead of considering these variables as separate lines of inquiry, this study examines whether or not governance affects ESG performance and whether estimated ESG performance is a mediating variable. The review also focuses on BRSR reporting context for Indian manufacturing firms. It instead offers a view that is specific to the sector and country, which might get washed out when analyzing firms from different industries or countries together. The second part of the research relates to the creation of an index of Sustainable Governance (SGI) according to board independence, Board diversity, sustainability oversight and accountability. This, in turn, allows us to explore sustainable governance as an overall

organisational characteristic instead of a one-dimensional measurement taken for a specific sustainability quality driven by governance. The study also looks at the individual performance of each pillar (environmental, social and governance) in detail. This is because the economic impact for manufacturing firms may be different along the three dimensions. Lastly, the analysis is framed as a dynamic panel-data structure and System-GMM estimation is suggested to explain persistence and possible endogeneity. The uniqueness of study is the governance–ESG–value framework, which was merged with BRSR context, analysis at pillar-level and dynamic estimation model.

1.6 Scope & Significance of Study

Data Source/ Data Context: The study is based on Indian manufacturing firms making disclosures voluntarily under the BRSR framework between 2021–2025 (depending on data availability and verification). Panel is 50 firms with 250 firm-year observations. Aspects of sustainable governance include board independence, board diversity, and sustainability oversight and accountability. We explore ESG performance through an aggregate measure of ESG, and using environmental, social and governance scores. Tobin's Q gives an idea of the overall firm value and is used as a dependent variable, while control variables are: Firm Size, Leverage, Profitability (ROA) & Sales growth. The Importance of the Element of Corporate Governance and Sustainability performance integration for firm valuation with a Good Business Strategy: What they are all about. Theoretically, it guides the ongoing discussion on whether governance mechanisms contribute to better ESG outcomes and whether those ESG outcomes are associated with market-based measures of firm value. The sustainability dimension is important to Indian manufacturing firms in relevance to decisions that either impact their regulatory compliance or resource routinization/optimization, employee relations sound as human capital at stake, operational exposure and long-term competitiveness. These findings enlighten managers and boards because firm performance may be the proof point for why sustainability responsibilities need to be embedded within governance structures. For the investor, and for other parties as well; a reminder that sustainability disclosure does not equal ESG performance. The conclusions of this study also have relevance for regulators & policymakers as the BRSR framework progresses. As the story unfolds, it can only get richer from understanding linkages among governance, performance on ESG measures and firm value with sustainability reporting in India. Nevertheless, the outcomes should be taken concerning the manufacturing companies and study period criteria. No further generalisation to the entire Indian company or any other sector must be attempted.

LITERATURE REVIEW

2.1 Related Work

2.1.1 Sustainable Governance and performance on ESG

The acceptance of corporate governance in determining how organisations respond to sustainability related issues is advancing. Traditional governance mechanisms concentrate on supervision management, safeguarding shareholder rights and enhancing accountability. Yet, in many ways governance is becoming synonymous with the oversight of ESG responsibilities and it has summarized both environmental AND social benefits. Attributes of the board like independence and diversity can affect how sustainability issues are incorporated in corporate decision making. Independent directors can enhance how well the board monitors management and limit excess managerial discretion, while board diversity may bring in fresh perspectives that instil greater concern for stakeholder-focused matters. Embedding ESG considerations across organisational policies and strategic decisions are also improved when sustainability-related roles, committees, oversight mechanisms (including hiring consultants or independent advisers), accountability systems are part of the organisation. These benefits may ultimately impact firm value either by enhancing expected future cash flows or mitigating perceived risk. That said, ESG activities can be expensive too. Environmental improvements, employees related efforts, sustainability systems and compliance measures may also results in short term cost increase. It also means the market is unlikely to value ESG activities in terms of their potential long-term benefits right away.

Empirical studies that have been conducted prior to yours thus obtained contradictory results. On the one hand, a number of studies find that ESG performance is positively associated with financial outperformance, while on the other hand, weakly insignificant, negative, or nonlinear relationships are confirmed in transactional analyses (e.g. Differences can be the result of differences in ESG measurement, sample

characteristics, industry conditions, institutional environment and research methodology. The mixed evidence circumstantiates that the effect of ESG performance on firm value varies across institutions and sectors, leaving a question mark over unconditionally increased market valuation from higher ESG performance.

2.1.2 Sustainable Corporate Governance and Firm Value

Corporate governance has attracted significant research interest with respect to firm value. Good governance may enhance firm value by improving managerial monitoring and reducing agency costs, enhancing the quality of strategic decisions from the board., and increasing investor confidence in management. The same arguments are equally applied to governance from a sustainability-oriented perspective since better board monitoring of environmental and social risks may facilitate firms' ability to manage complex (emerging) regulatory, operational, and reputational risks. That said, formal characteristics of the board cannot be taken as criteria for governance

quality. A firm can have independent directors and/or a diverse board, without these mechanisms necessarily impacting sustainability decisions or corporate performance. Thus, the economic importance of governance is therefore to some extent determined by how governance mechanisms work in practice. This finding forms an essential foundation for the current study. A Sustainable Governance Index (SGI): instead of exploring one isolated aspect of corporate governance, this study combines four important aspects of SD into one index: board independence, board diversity, sustainability oversight, and accountability. This method allows for a more comprehensive depiction of the governance structures that support sustainability-related decision making.

2.1.3 The Potential Mediating Mechanism of ESG Performance

One of the most significant ways this literature can be extended is by considering ESG performance as a potential channel through which governance impacts firm value. At this level, governance is the organisational input, ESG performance is the sustainability output, and firm value can be a potential market outcome. The structures that firms require to develop and implement ESG practices are potentially provided by strong governance. Better ESG performance may then impact stakeholders, lower some business risks, enhance reputation or enhance operational strength which potentially impacts the market value. This contrasts with research that examines the direct association between governance and firm value or ESG and firm value. Nevertheless, the presence of those isolated relationships does not serve as an automatic mediator. To ascertain whether ESG indeed mediates some proportion of the sustainable governance–firm value link, a formal indirect-effect analysis must be performed. The current research thus examines ESG performance as a potential mediating mechanism and treat the mediation relationship as an empirical rather than a priori outcomes.

2.2 Analysis of Literature

First, the literature remains fragmented. Governance, ESG performance and firm value are often studied as individual identified relations. Although these studies offer some valuable information, they give a weak sense of the direct and indirect influence that governance mechanisms exert through ESG outcomes on firm value. Second, nascent evidence on the link between ESG and firm value is mixed. Last but not least, positive evidence is unlikely to be generalizable the effects of ESG likely depend on industry, country, measurement framework and time horizon. This is especially pertinent to manufacturing firms, where a sustainability investment can vary the financial implications compared to service-based industries. Third, this raises a key measurement problem. There is a difference between ESG disclosure and ESG performance. That, combined with the increasing availability of BRSR information, makes corporate transparency easier than before; However, better disclosures do not demonstrate that a firm has achieved comparative sustainability performance. On this basis it must be acknowledged that research needs to disentangle among the information that firms report from actual ESG performance (which those measures represent). Fourth, many empirical studies are based on static relationships. Which may not properly be captured by the persistence of firm value or ESG. We can also think about reverse causality: financially stronger firms have more resources in investing for sustainability, and governance is itself affected by performance. These issues lead to possible endogeneity that has not been included in the empirical modelling. Aggregate ESG scores may mask differences at the level of individual pillars. It is also possible that a firm benchmarks well on governance relative to its peers but not so much on environmental

issues — or vice versa. Therefore, an aggregate ESG variable may mask associations that emerge when the three pillars are analysed separately. And finally, the Indian BRSR context is still early. BRSR represents a golden opportunity to use a relatively ordered reporting milieu for studying corporate behaviour on sustainability issues but evidence regarding the association among sustainable governance, ESG performance and market value in Indian manufacturing continues to be scant. Together, these limitations imply that the state of literature can provide a useful starting point but not commit its entirety to explain the governance–ESG–value relationship as theorized.

2.3 Identified Research Gaps

Based on the critical assessment, the following research gaps are identified:

Table 2.1: Identified Research Gaps

Research Gap	What Existing Research Shows	Gap Addressed by the Present Study
Integrated framework	Governance–value and ESG–value relationships are often examined separately.	Examines sustainable governance, ESG performance, and firm value within one framework.
Indian BRSR context	BRSR has created a relatively new sustainability-reporting environment.	Focuses specifically on BRSR-reporting Indian manufacturing firms.
Manufacturing-sector focus	Many studies combine firms across different industries.	Concentrates on manufacturing firms with distinctive sustainability risks and responsibilities.
Disclosure vs. performance	ESG disclosure is sometimes used as an indicator of sustainability.	Distinguishes ESG performance from the broader reporting environment created by BRSR.
Dynamic relationships	Static models may not adequately address persistence and potential endogeneity.	Uses a dynamic panel-data framework and proposes System-GMM estimation.
ESG pillar differences	Aggregate ESG measures may conceal differences among E, S and G.	Examines environmental, social, and governance performance separately.
Mediating mechanism	Limited evidence directly examines ESG as a pathway between governance and firm value.	Tests ESG performance as a potential mediator.
Sustainable governance construct	Governance is often represented by individual board characteristics.	Develops a Sustainable Governance Index using multiple governance dimensions.

2.4 Rationale for the Current Work

These identified gaps create a clear rationale for the current study. The Environment, Social and Governance (ESG) disclosure framework in India has undergone a transformation with the introduction of Business Responsibility & Sustainability Report (BRSR) along with newest Corporate Laws, which creates an increasingly relevant corporate reporting ecosystem by clarifying the expectations from sustainable practices and disclosures; thereby examining whether sustainability related governance mechanisms are linked to real ESG performance or whether such outcomes have any bearing on firm value. This is also relevant because sustainability issues are a major concern for manufacturing firms. The environmental impact of operations, consumption of resources, employee safety and labour regulations as well as relations with supply-chains and regulatory compliance can affect operational performance as well as stakeholder perception. This is why studying manufacturing firms separately allows for a cleaner context of examining the governance–ESG relationship.

Materials and Methods

3.1 Materials

We examine a quantitative longitudinal panel dataset of 50 Indian manufacturing firms covering the period 2021–2025 that yields an unbalanced firm-year data set comprising up to (N) = 250 observations. Since the

analysis solely uses secondary firm-level data, no chemicals, laboratory equipment or human participants were involved. The main variables include the Sustainable Governance Index (SGI), overall ESG performance, environmental (ENV) scores, social (VAR for SOC) scores GOV (denom. For governors will be black. manager white and director are black black brown) score as well as Tobin's Q (measured firm value). Control variables include firm size, leverage, return on asset (ROA), and sales growth. In the case of Sustainability, governance dimensions are represented as four: board independence; board diversity; sustainability oversight and accountability. These dimensions are instead aggregated in the Sustainable Governance Index (SGI) We explore ESG performance both via a single aggregate measure of ESG as well its three constituent pillars. The market-based measure of the value of firms used is Tobin's Q. The analysis hence employs a panel firm-year structure with each observation denoting one manufacturing entity in 1 financial year. This structure gives the analysis a temporal dimension to consider governing, ESG performance and firm value changes rather than relying only on cross-sectional differences.

3.2 Methodology

This study applied a quantitative research approach, longitudinal and explanatory. The conceptual model considers the relation between sustainable governance, ESG performance and firm value. Sustainable governance is the main theory construct, ESG performance an intermediary measure of firm-value, and Tobin's Q as principal measurement of ecological value.

The empirical framework consists of three principal relationships:

- Sustainable Governance → ESG Performance
- ESG Performance → Firm Value
- Sustainable Governance → Firm Value

The study also considers whether ESG performance may provide a transmission mechanism between sustainable governance and firm value and whether the environmental, social, and governance pillars exhibit different relationships.

The basic firm-value specification can be represented as:

$$TQ_{it} = \alpha + \beta_1 SGI_{it} + \beta_2 ESG_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 SG_{it} + \varepsilon_{it}$$

where TQ denotes Tobin's Q, SGI represents sustainable governance, ESG represents aggregate ESG performance, $SIZE$ denotes firm size, LEV represents leverage, ROA denotes return on assets, and SG represents sales growth. Because firm value may persist over time and governance and ESG variables may be jointly related to firm-specific characteristics, a dynamic specification incorporates the lagged dependent variable:

$$TQ_{it} = \alpha + \rho TQ_{i,t-1} + \beta_1 SGI_{it} + \beta_2 ESG_{it} + \sum \gamma_k X_{kit} + \mu_i + \lambda_t + \varepsilon_{it}$$

where $TQ_{i,t-1}$ represents lagged firm value, μ_i captures firm-specific effects, and λ_t represents time effects. The proposed principal estimator is System Generalised Method of Moments (System-GMM), following the dynamic-panel framework developed by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). The approach is intended to address persistence in the dependent variable, potential endogeneity, reverse causality, and unobserved firm-specific heterogeneity.

3.3 Data Collection

This study is based on secondary firm-level data of Indian manufacturing firms who report BRSR for the years 2021–2025. Based on this, firms were selected to make up a balanced panel of 50 companies with observables available over the duration considered in study. The three overall stages of the data-collection process. The governance and ESG measures are constructed by identifying firm-level governance and sustainability information. Then, the financial and market data which are used to compute Tobin's Q as well as control variables. Third, the panel dataset was assembled by firm and financial year. This study distinguishes between ESG Disclosure and ESG Performance. It is, therefore, an institutional reporting context that BRSR reporting contributes to rather than blanket evidence of superior ESG performance. This distinction is important since disclosure provides information on what has been reported by a firm; in contrast, ESG performance relates to the actual environmental, social and governance outcomes behind the selected measures. Research dataset yields 250 firm-year observations. It validates the data for consistency and variable availability before proceeding to statistical analysis.

3.4 Data Analysis

The analysis has been undertaken over a series of steps. Descriptive and correlation analysis are firstly conducted to shed light on the distributions of SGI, ESG, three pillars characterizing the initial relationships between investment in sustainability proxied by Tobin's Q along with control variables. Second, a benchmark model of heteroskedasticity-robust pooled regression is being estimated. Stakeholders and ESG indicators – This is the first step of an analysis that begins to establish a relationship between sustainable governance, ESG performance and firm value. Third, to test whether the persistence in Tobin's Q holds constant even with a lagged firm-value specification estimates of residuals using an intermediate model via a dynamic specification rather than final estimator are required. Fourth, we investigate the relationship between SGI and aggregate ESG performance. Then, within each of the pillars – environmental, social and governance a mixture-of-effects (MIXED) model estimation on pscore are separately estimated to examine if the linkage between sustainable governance and ESG performance varies across dimensions.

Results

It uses the panel data of 50 Indian manufacturing firms with observations made over period 2021–2025 in a balanced working format, which translates to total firm-year observation equals —250. The analysis starts with describing relationships among the main variables and continues by presenting a reference pooled regression, an initial dynamic specification as well as sustainable governance role on ESG performance. Different specifications are written for the environmental, social and governance pillars. As the final System-GMM estimation and its corresponding diagnostic tests are still forthcoming, all results in this section should be treated as preliminary empirical evidence rather than causal estimates.

4.1 Descriptive and Correlation Analysis

Initial insights for the relationships between sustainable governance, ESG and firm value as well as amongst each of the underlying ESG pillars are derived via correlation analysis. On the level of aggregate ESG performance ($r = 0.367$), stable positive correlations can be observed between SGI and all dimensions. The correlation is also strong with the social pillar ($r = 0.314$) and governance pillar ($r = 0.247$), while it with environmental performance has a low level of significance ($r=0.071$). Tobin's Q: SGI shows a small but significant positive association with Tobin's Q ($r = 0.139$). This correlation delivers a valuable first step in evidence for the governance–ESG–value framework. They are, however, bivariate associations and therefore do not control for firm characteristics; time effects or persistence of variable between years (firm fixed-effects), also a consideration is that these correlations may be endogenous. The correlation coefficients must therefore not be interpreted as evidence of causal relationships.

Table 4.1 Correlation Matrix of the Principal Study Variables

Variable	SGI	ESG	ENV	SOC	GOV	Tobin's Q
SGI	1.000	0.367	0.071	0.314	0.247	0.139
ESG	0.367	1.000	—	—	—	—
ENV	0.071	—	1.000	—	—	—
SOC	0.314	—	—	1.000	—	—
GOV	0.247	—	—	—	1.000	—
Tobin's Q	0.139	—	—	—	—	1.000

The correlation pattern aligns broadly with the theoretical argument that governance structures may be more closely related to social and economic than environmental outcomes. Multivariate and dynamic estimation however is needed to test this interpretation.

4.2 Relation between Sustainable Corporate Governance and ESG performance

The finding of a significant positive correlation in the aggregate ESG performance between SGI holds initial supportive for part one research framework. A coefficient of 0.367 reflects the fact that, among working sample participants, these two constructs are somewhat positively related to one another (i.e., higher levels nonperceptions of Control associated with higher values from Job Insecurity). Things are not uniform across

the three ESG pillars. The association between SGI and social performance is stronger than the relationship with environmental performance, whereas governance also has a positive correlation to SGI. The weak correlation to the measured environmental performance is suggestive of a scenario where improvement in these areas may be driven less from governance at the board level, and more by technology (adoption), capital provisions as well as production processes, energy efficiency/optimized usage of resources/application sector used with that firm's regional industry standards impacting environment. However, these results should still be seen as exploratory and not indicative that stronger governance leads to better ESG performance; correlation does not prove causation.

4.3 Preliminary Firm-Value Regression

A heteroskedasticity-robust pooled regression was estimated as a benchmark specification testing the relationship between SGI, ESG performance and Tobin's Q (Table 2).

Table 4.2. Preliminary Firm-Value Regression

Variable	Coefficient	Robust SE	p-value
Constant	0.873	[insert actual SE]	<0.001
SGI	0.491	0.185	0.008
ESG	0.0008	0.003	0.755
Firm Size	0.0095	0.015	0.529
Leverage	-0.310	0.085	<0.001
ROA	2.178	0.341	<0.001
Sales Growth	0.027	0.103	0.792
R ²	0.185		
Adjusted R ²	0.165		

The pooled specification reveals a positive and statistically significant relationship between SGI and Tobin's Q ($\beta = 0.491$, $p = 0.008$). On the other hand, aggregate ESG performance coefficient is positive but statistically insignificantly at $\beta = 0.0008$ ($p = 0.755$). As for control variables, leverage is negatively related to firm value ($\beta = -0.310$, $p < 0.001$), while ROA positively relate to Tobin's Q ($\beta = 2.178$, $p < 0.001$). In this specification, firm size and sales growth are not statistically significant. The model accounts for around 18.5% of the variance in Tobin's Q; while this finding provides initial support for a governance–value relationship (i.e., positive SGI coefficient), the pooled specification is insufficiently controlled for dynamic persistence, firm-specific heterogeneity or endogeneity. As such, it is used as a benchmark and not the main empirical specification. A final correction prior to submission: the standard error for the constant prints as “value” in the working article. The actual estimated value must then be inserted in this place or the constant has to be dropped from the reported table.

4.4 Preliminary Dynamic Firm-Value Specification

In order to explore if the between-governance and value relationship holds when taking into account persistence of firm value, a one-period lag of Tobin's Q is added in the benchmark specification. The lagged Tobin's Q coefficient is approximately negative and insignificant ($\beta = -0.035$, $p = 0.611$). Next, we report the specification results when SGI is replaced with Aeg. The coefficient on firm value stays positive for SGI, but has decreased to ($\beta = 0.383$, $p = 0.081$) is significant at the var=10% level. The poor aggregate ESG performance stays statistically insignificant ($\beta = 0.003$, $p = 0.279$) Leverage has,872 and continued to have statistically significant negative association, ROA has become and still is (statistically) significantly positive. This gives an R² of about 0.211.

Table 4.3. Preliminary Dynamic Firm-Value Specification

Variable	Coefficient	Interpretation
Lagged Tobin's Q	−0.035 (p = 0.611)	Statistically insignificant
SGI	0.383 (p = 0.081)	Positive, 10% level
ESG	0.003 (p = 0.279)	Statistically insignificant
Leverage	Negative, significant	Persistent negative association
ROA	Positive, significant	Positive association
R ²	0.211	—

This reduces the classical statistical significance of the estimated relationship between governance and value, as suggested by the decline in SGI coefficient from 0.034 to 0.010, as well as its p-value (the soft level of significance: from less than 1% to more than 5%) after bringing in dynamic persistence components of both firm value and governance within our empirical model specification. In more importantly, this initial dynamic model is not endogenous or does not remove unobserved fixed effects at the firm level. Thus, these estimates should not be seen as that alternative to the proposed System-GMM estimation.

4.5 Sustainable Governance and ESG Performance

The second analysis explores whether sustainable governance predicts better ESG performance in the following years. In the preliminary dynamic ESG specification, this yields a positive SGI coefficient of 79.192 (p = 0.049), whereas the lagged ESG coefficient is negative and statistically insignificant ($\beta = -0.106$, p = 0.279).

Table 4.4. Preliminary Dynamic ESG Specification

Variable	Coefficient	SE	p-value
Lagged ESG	−0.106	0.098	0.279
SGI	79.192	40.184	0.049
Firm Size	0.224	0.633	0.724
Leverage	−1.886	2.791	0.499
ROA	2.282	13.159	0.862
Sales Growth	−1.614	3.006	0.591

The positive SGI coefficient provides initial corroboration for the proposed governance-to-ESG relationship. You should not compare the magnitude of the coefficient directly with those estimated in the firm-value model because SGI and ESG are measured on different scales. This finding indicates that firms which have a stronger sustainability-oriented governance development tend to show broader ESG performance in the working sample. However, this outcome should be verified by means of the last dynamic estimator followed with correct specification and diagnostic tests, before being proposed as a conclusive empirical fact.

4.6 Pillar-Level Analysis

Overall, understanding of ESG aggregation may hide variation across individual ESG dimensions. Consequently, preliminary specifications for environmental, social, and governance performance were separately anticipated.

Table 4.5. Preliminary ESG-Pillar Specifications

Dependent Variable	SGI Coefficient	p-value	Preliminary Interpretation
Environmental Score	8.381	0.280	Positive, statistically insignificant
Social Score	36.971	<0.001	Positive, statistically significant
Governance Score	25.681	<0.001	Positive, statistically significant

As indicated in the results, SGI is positively but statistically not significantly associated with EP ($\beta = 8.381$; $p = 0.280$). On the contrary, SGI is significantly and positively correlated to social performance ($\beta = 36.971$, $p < 0.001$) and governance performance ($\beta = 25.681$, $p < 0.001$).

The pattern suggests that the link between sustainable governance and ESG score might be different between individual pillars. Board oversight, organisational policies, frameworks for monitoring and accountability structures are likely to be more tightly correlated with social and governance outcomes; environmental improvements may evolve over longer periods of time (perhaps due to technology investments or development of production processes). For the present analysis, this explanation is interpretive in nature rather than a directly tested mechanism.

4.7 Preliminary Hypothesis Assessment

Table 6 provides an overview of what is currently known with respect to the five hypotheses.

Table 4.6. Preliminary Hypothesis Assessment

Hypothesis	Proposed Relationship	Working Evidence	Present Status
H1	Sustainable Governance $\rightarrow$ ESG	Positive and statistically significant association	Preliminary support
H2	ESG $\rightarrow$ Firm Value	Positive but statistically insignificant	Not supported in benchmark specification
H3	Sustainable Governance $\rightarrow$ Firm Value	Positive in pooled model; weaker in dynamic specification	Inconclusive
H4	SGI $\rightarrow$ ESG $\rightarrow$ Firm Value	Indirect effect not formally estimated	Inconclusive
H5	E, S and G exhibit heterogeneous relationships	Pillar coefficients differ	Preliminary indication only

Discussion

5.1 Discussion of Findings

The results substantiate initial evidence for the hypothesised relationship between sustainable governance, ESG performance and firm value. The positive correlation between the Sustainable Governance Index (SGI) and ESG performance is the most widespread finding. In the first stage dynamic specification, SGI is positively related to aggregate performance in ESG ($\beta = 79.192$, $p = .049$). These results line up with the core argument that governance structures with board oversight of sustainability, their role in sustainability and accountability mechanisms are supportive for ESG practices. This is not equally strong amongst three ESG dimensions. In the case of SGI, both social ($\beta = 36.971$, $p < 0.001$) and governance pillar ($\beta = 25.681$, $p < 0.001$) show positive statistically significant association while environmental association is again positive but not statistically significant ($\beta = 8.381$, $p = 0.280$). The difference also suggests that governance mechanisms are probably more directly linked to organisational policies, practices related to employees and monitoring/accountability systems rather than with environmental outcomes for which greater investments or technological transformation may be necessary, and the very long time periods associated with change. It should be noted that this interpretation is an explanation we offer and was not directly tested in the present study.

Evidence regarding firm value is more mixed in nature. In the benchmark pooled regression, SGI is positively and significantly related to Tobin's Q ($\beta = 0.491$, $p < 0.01$). When you add a lagged dependent variable then this coefficient drops to 0.383 and loses significance ($p = 0.081$). This alteration is indicative of

that the governance–value relationship we observe is spanning the sensitivity surrounding how we handle dynamic persistence. Pure static pooled regression is furthermore rejected; hence the result provides an important motive for why a dynamic panel framework should be used instead.

The power of the overall ESG rating to drive firm valuation seems rather shaky in this analysis. In the benchmark specification ESG has a statistically insignificant and positive coefficient ($\beta = 0.0008$, $p = 0.755$) that stays statistically-insignificant in both of our preliminary dynamic specifications ($\beta = 0.003$, $p = 0.279$). Therefore, the current findings do not support a contemporaneous statistically significant ESG–Tobin's Q association in the working sample. It also suggests why ESG performance should not be assumed to result in an immediate market-valuation effect.

5.2 Comparison with the proposed Research framework

The results largely align with the structure suggested in the conceptual framework, though not all pathways were equally supported quantitatively. Governance-to-ESG pathway is provisionally supported, while the ESG-to-firm-value pathway is commonly statistically insignificant ($p = .05$ for 1% false discovery rate) in all reported specifications. The pooled model demonstrates the direct governance-to-firm-value linkage (effect of corporate

governance practices on firm value levels) which is increasingly muted in the dynamic specification. This pattern indicates that the contemporaneous chain among governance, ESG and firm value where higher market valuation, leads to improved social performance may not capture fully the relationship. Whereas governance could affect organisational capability to implement ESG actions, the financial or market benefits of such actions will be contingent on time horizons, firm attributes and industry factors as well as the nature of ESG activities in themselves.

5.3 Implications of Pillar-Grades Findings

The pillar-level findings are the ones most relevant, because an aggregate ESG score can hide differences between environmental, social, and governance outcomes. The strongest preliminary association in the current analysis is with the social and governance dimensions, while that with the environment is statistically insignificant. This distinction could be quite significant for manufacturing firms. Social and governance practices are more simply integrated on several levels such as board oversight, internal policies mechanisms for accountability, employee systems and reporting structures. More resource-intensive measures for environmental improvements may involve cleaner technologies, energy efficiency measures, waste management and emissions reduction or production-process modification. These findings could help explain the weaker contemporaneous association for the environmental pillar. However, the analysis currently does not test formally whether the coefficients of the three pillars are statistically different. As a result, the differences in coefficients should not be reported yet as definitive evidence of heterogeneous effects.

5.4 Implications for the Mediation Relationship

The theoretical framework suggests a link between sustainable governance and firm value by way of ESG performance. Because SGI is positively correlated to ESG performance, the preliminary results impose partial settings for scrutinizing this mechanism as the direct ESG–firm-value relationship remains statistically insignificant in the present specifications. It must be noted that the current results do not allow to establish a mediation hypothesis. An indirect-effect formal analysis has not been conducted to date. Consequently, the current evidence does not support the interpretation of ESG as mediating the sustainable governance firm value relationship. A formal mediation test using the final validated panel specification would be necessary prior to concluding this pathway.

5.5 Theoretical Implications

The results offer initial evidence for treating sustainable governance as something other than an ordinary governance attribute. Governance, as an organisational mechanism that could influence practices associated with sustainability implementation; a primary component of the framework proposed in this work. The results further back the analytical benefit of disaggregating aggregate ESG performance into its underlying dimensions. These results suggest that while ESG can be viewed as a single, homogenous construct approaching the three components separately may miss differences in approaches used for how governance mechanisms relate to

particular sustainability outcomes. Conversely, the substantial governance results imply that the effects of governance and ESG performance on firm value should not be assumed to materialize evenly nor overnight. This is a promising avenue for future work, but it does not rule out additional panel-based exploration of the dynamics undergirding these relationships.

Conclusion

The current paper investigates the link between sustainable governance, ESG performance, and firm value in a sample of 50 Indian manufacturing firms for 2021–2025-time span. Building upon a governance–ESG–value framework that represents sustainable governance in terms of board independence, board diversity, sustainability oversight, and accountability and analyses ESG performance both as a composite score and across its environmental, social and governance pillars, the analysis was developed. So far, the results suggest that responsible governance is positively associated with overall ESG performance. The relationship is especially pronounced for the social and governance dimension while the association with environmental performance is positive but not statistically significant. The findings thus indicate that governance mechanisms may have implications for ESG practices though the extent of these relationships varies along the ESG spectrum.

The results surrounding firm value are more muted. Sustainable governance positively and statistically significantly correlates with Tobin's Q in the pooled benchmark specification, but we find little evidence of a stable effect when properly accounting for dynamic persistence. We find no contemporaneous statistical association of aggregate ESG performance with Tobin's Q in the reported specifications. The results suggest that the link between governance specific to sustainability and market value may be more complex than a simple ESG-to-value effect.

6.1 Main Conclusions

It draws four key conclusions based on the research. Sustainable governance is positively associated with ESG performance in the working sample. First, while the preliminary meta-relationships between ESG sustainability performance and financial performance are consistent with our hypotheses (investors perceive a stronger association for social and governance than for environmental), they vary across the three pillars of sustainability. In the third place, the governance–firm-value relationship is sensitive to the model specification. To sum up, we do find some evidence of a negligible contemporaneous relationship between both aggregate ESG performance and firm value. Importantly, the results are a preliminary rather than conclusive finding as the final validated System-GMM estimation, mediation analysis and formal tests of heterogeneous pillar effects have not yet been presented.

6.2 Contribution of the Study

This study adds to the initial discourse, especially for India on corporate sustainability by inserting sustainable governance, ESG performance and firm value into one analytical framework. It also specifically focuses on the Indian manufacturing firms in BRSR reporting ecosystem. An additional contribution is the disentangling of

aggregate ESG performance into environmental, social, and governance components. This helps to prevent the notion of ESG from being treated as a monolithic construct and gives room for examining independently the relationships between governance and sustainability sub-dimensions. This will highlight the need to analyse relationships suspected of being persistent, firm-specific or endogenous using a dynamic panel framework.

6.3 Limitations of the Study

Limitations should be interpreted in light of the findings. 49. The panel is limited to 50 firms over a five-year period, so any generalisation beyond the chosen manufacturing firms is not possible. The limited timescale does not allow for the assessment of sustainability effects in the longer term. Moreover, the current empirical findings are exploratory. Model 6 in Table 2 shows the results of final System-GMM estimations and diagnostic statistics, as further analysis needs to be taken before stronger conclusions regarding dynamic relationships or causality. H4 concerning the required mediation relationship has not been statistically

estimated, nor have the differences between ESG-pillar coefficients yet been formally tested for statistical significance. Transparent description, derivation, and robustness checks are needed to build the Sustainable Governance Index and measure ESG performance as well. Differences in measurement methods for ESG may play a role in the differing results.

6.4 Future Research Directions

Future research could broaden this study to a wider manufacturing sample and over many more years as BRSR data is published. Furthermore, validated System-GMM estimates with very restricted and collapsed instruments could be used in subsequent studies addressing the issues of dynamic persistence and possible endogeneity more rigorously. Future studies could formally test the proposed $SGS \rightarrow ESG \rightarrow \text{Firm Value}$ mediation pathway and statistically determine whether environmental, social, and governance coefficients differ. The evidence could also be further supported by using alternative measures of firm value, alternative ESG measures and alternative constructions of sustainable governance as robustness checks. In general, the paper presents a framework for an initial empirical exploration of sustainability-oriented governance and thereby its association with ESG performance and firm value in the Indian manufacturing setting while assuming that these preliminary findings need to be more rigorously tested before unambiguous statements can be made.

Acknowledgements

The authors express their gratitude for the support and academic guidance provided by the Department of Business Management and Commerce, Desh Bhagat University, Mandi Gobindgarh, India while preparing this study.

Conflict of Interest

The authors declare that they have no conflict of interest concerning the research, authorship, and publication of this paper.

Data Availability Statement

This study uses secondary firm-level data of Indian manufacturing firms for the years 2021–2025. This dataset was assembled from accessible public corporate, sustainability, financial and market-oriented data. Branić et al, 2022 The underlying individual level and analytical data can be made available upon reasonable request (with appropriate data use agreements) from the corresponding author.

Author Contributions

Ruffee Mahajan: Conceptualization, writing the review of literature, data collection, methodology, data analysis and interpretation of results and manuscript preparation.

Supervision, conceptual guidance, methodological review, drafting and revision of the manuscript, academic oversight: Dr. Nameeta Garg

The final manuscript was read and approved by both authors.

References

1. Arellano, M., & Bond, S. .1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277–297.
2. Arellano, M., & Bover, O. .1995. Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29–51.
3. Blundell, R., & Bond, S. .1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143.
4. Friede, G., Busch, T., & Bassen, A. .2015. ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210–233.
5. Securities and Exchange Board of India. .2021. *Business responsibility and sustainability reporting by listed entities*. SEBI.
6. Shleifer, A., & Vishny, R. W. .1997. A survey of corporate governance. *The Journal of Finance*, 52(2), 737–783.
7. Suchman, M. C. .1995. Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571–610.

8. Tobin, J. .1969. A general equilibrium approach to monetary theory. *Journal of Money, Credit and Banking*, 1(1), 15–29.

Copyright & License:

© Authors retain the copyright of this article. This work is published under the Creative Commons Attribution 4.0 International License (CC BY 4.0), permitting unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.