

SUSTAINABLE SUPPLY CHAIN MANAGEMENT PRACTICES AND THEIR MEDIATION EFFECT ON ECONOMIC RETURNS

Kali Charan Sabat^{*}, Bala Krishnamoorthy^{**}

^{*} Corresponding author, Administrative Staff College of India, Hyderabad, India

Contact details: Administrative Staff College of India, Bella Vista, Raj Bhavan Road, Khairatabad, Hyderabad, 500082. India

^{**} School of Business Management, SVKM's Narsee Monjee Institute of Management Studies, Mumbai, India

Abstract

How to cite this paper: Sabat, K. C., & Krishnamoorthy, B. (2020). Sustainable supply chain management practices and their mediation effect on economic returns. *Corporate Governance and Sustainability Review*, 4(1), 8-20. <http://doi.org/10.22495/cgsrv4i1p1>

Copyright © 2020 by Virtus Interpress. All rights reserved

ISSN Online: 2519-898X
ISSN Print: 2519-8971

Received: 28.10.2019
Accepted: 19.12.2019

JEL Classification: D22, M11, M14, Q56, I52
DOI: 10.22495/cgsrv4i1p1

This paper examines whether companies' sustainable supply chain efforts are related to the companies' corporate governance and economic performance. Data from Bloomberg's Environmental, Social, and Governance (ESG) and Financial Analysis (FA) databases were used to empirically test the relationships. The paper is an effort to contribute to the body of sustainable supply chain management (SSCM) literature by being amongst the first in India to use the secondary data source for investigating financial and corporate governance (CG) benefits' association with social and green supply chain management practices. After collecting data of Indian manufacturing companies listed in the Bloomberg's ESG terminal, we first tested the relationship of the three ESG factors: environmental, social and governance with the companies economic returns (ER). In the next level, we extended the study to find whether firms' CG initiatives mediate the relationship of green supply chain management (GSCM) and socially responsible supply chain management (SRSCM) practices with the firms' ER. In the study, it was observed that CG activities mediate the relationship between SRSCM and ER whereas it has a negligible mediation effect on the association between GSCM and ER.

Keywords: Sustainable, Economic Returns, Corporate Governance, Mediate, Corporate Social Responsibility

Authors' individual contribution: Conceptualization - K.C.S. and B.K.; Methodology - K.C.S. and B.K.; Formal Analysis - K.C.S.; Investigation - K.C.S. and B.K.; Data Curation - K.C.S.; Writing - K.C.S.; Visualization - K.C.S.; Supervision - B.K.

1. INTRODUCTION

In recent years, several studies focussed to test whether environmentally responsible corporate and social practices (Grove & Clouse, 2018; Sarand, Barzoki, & Teimouri, 2019) contribute to the economic growth of the organisation (Ameer & Othman, 2012; Wang & Sarkis, 2013). Mounting institutional and regulatory pressures have driven firms to develop their focus to make organizations sustainable. Sustainable practices mean "environmentally friendly and socially responsible actions not only obligatory by law but going beyond regulatory compliance by voluntarily internalizing externalities" (Zhu, Cordeiro, & Sarkis, 2013, p. 234). Remarkable changes were witnessed in the last two

decades towards the interest level of preserving and sustaining the environment (Chien & Shih, 2007). Organizations are not just facing pressure from regulators and customers to become environment-conscious but are also under pressure to be socially responsible. As stated by the European Commission (2007), for an organization, being socially responsible means that "past legal requirements, businesses accept to bear the cost of practicing ethical behaviour by voluntarily pledging to improving employment conditions, banning child labour and not working with countries that do not respect human rights, protecting the environment and investing in equipment to reduce their carbon footprint, developing partnerships with NGOs, providing funds to charity, etc." (Crifo, Diaye, &

Pekovic, 2016, p.406). Hence, environmental protection and social accountability have become integral elements of the organizations' corporate social responsibility (CSR) (Yeung, 2019).

As part of CSR initiatives firms have started making substantial investments in environmental, social and governance (ESG) practices; therefore it is critical to understand the link of ESG practices with the economic health of the organisation. Companies reporting ESG practices have shown higher financial returns when compared with their non-ESG reporting competitors (Grove & Clouse, 2018).

Quite often companies have adopted the ESG practices due to various external pressures from different stakeholders, without conducting any study to understand the benefits of these practices (Zhu, Sarkis, & Geng, 2005; Zhu & Sarkis, 2006; Lee, 2008; Chang, Kenzhekhanuly, & Park, 2013). For example, regulatory requirements imposed by local governments have triggered the implementation of green supply chain management (GSCM) (Muduli, Biswal, Satapathy, Barve, & Tripathy, 2017; Jasim & Paramasivan, 2017) and socially responsible supply chain management (SRSCM) practices in some countries (Mudgal, Shankar, Talib, & Raj, 2009). Also, many companies have adopted the GSCM and SRSCM practices voluntarily (Narasimhan & Carter, 1998; Christmann, 2000) or due to competitive reasons (Hofer, Cantor, & Dai, 2012; Hsu, Choon Tan, Hanim Mohamad Zailani, & Jayaraman, 2013) or for deriving some kind of economic benefits (Luthra, Kumar, Kumar, Haleem, 2011).

The impact of GSCM and SRSCM practices on firms' economic returns has started receiving substantial notice in the literature (e.g., comprehensive review by Margolis, Elfenbein, & Walsh, 2009). Though several meta-analysis studies (Orlitzky, Schmidt, & Rynes, 2003; Margolis et al., 2009) concluded that the relationship between corporate GSCM and SRSCM practices, and firms' economic returns (ER) are direct and non-negative, there is no unanimity up to now (Crifo et al., 2016). Green and social accountability seems to have a multifaceted influence on firms' economic performance however the causality is yet to be proven. Despite the fact some researchers have argued that investments in GSCM and SRSCM rise a firm's operating cost, thus making the products and services less competitive (McWilliams & Siegel, 2000). But a group of researchers has suggested that by investing in GSCM, SRSCM and corporate governance (CG), a firm can gain competitive advantage through the use of better quality resources and superior employees leading to more responsive services and products. This will further reduce the firm's exposure to supply chain uncertainties (McWilliams & Siegel, 2000).

According to Cavaco and Crifo (2014), one key factor for the absence of harmony between the researchers lies in the quality-quantity trade-off amongst the different dimensions of CG, where quality is considered as "the interactions amongst CSR practices employed" and quantity refers to "the effect of the CSR dimensions in isolation and interactions between various other CSR dimensions" (p. 3325). An organization's CSR policy can be multi-dimensional and it can include environmental, social and corporate governance factors (Crifo et al., 2016). Therefore, just using a single factor as

a proxy for a firm's CSR practices may perhaps result in some degree of uncertainty between the association of CSR and the firm's ER (Surroca, Tribó, & Waddock, 2010).

Many researchers such as Brammer and Milligton (2008), and Barcos, Barroso, Surroca, and Tribo (2013) have suggested that several CSR factors like green and socially responsible behaviour are directly and positively related to the firm's ER, while some have no impact on the firm's ER. Barnett and Salomon (2006) pointed out that "CSR investments diverge by the amount of a firm's social screening and also the types of social screens that a firm employs" (p 1103). Therefore, the CSR activities must be divided amongst the diverse factors to understand its differential influence of each factor on the firm's performance (Barcos et al., 2013). Furthermore, a thorough understanding of how these CSR factors act together as inputs for higher values of ER is also important. In a setting with constrained resources, firms may encounter a quantity (number of CSR factors engaged) and quality (interactions amongst the CSR factors engaged) trade-off, leading to a multifaceted and uncertain relationship of the CSR factors with firm's economic performance.

To measure CSR outcomes, most of the recent studies have focused on the CSR ratings provided by different independent rating agencies. In this study, we have collected the secondary data from Bloomberg's ESG database as a proxy for CSR factors. "Secondary data is useful not only to find the information to solve our research problem but also to better understand and explain our research problem" (Ghauri & Grønhaug, 2005, p 113). Data of all the Indian manufacturing companies indexed in Bloomberg's ESG terminal was collected to test the relationship of the three ESG factors: Environmental, social and governance with the companies ER. Subsequently, the study was further extended to find whether firms' CG initiatives mediates the association between GSCM practices and SRSCM practices, and firms' ER. In this study, it was observed that CG activities mediate the relationship between SRSCM and ER whereas it showed an insignificant mediation effect on the relationship between GSCM and ER.

This paper is structured as follows. Section 2 presents the literature review and testable hypotheses while Section 3 provides the research methodology used for the study. Section 4 presents the data analysis, hypothesis testing and empirical results. Section 5 discusses the findings and presents our recommendations. Finally, Section 6 concludes the paper with a dialogue on managerial implications and scope for future research work in the same research area.

2. REVIEW OF LITERATURE AND HYPOTHESES DEVELOPMENT

There are several previous research work that anecdotally suggests that ESG practices do result in economic pay-offs (Orlitzky et al., 2003; Falck & Hebllich, 2007; Ariely, Bracha, & Meier, 2009; Grove & Clouse, 2018). However, the findings from the previous studies have also shown mixed results depending on the geographic location, intensity and focus of the research study (Wagner, Van Phu,

Azomahou, & Wehrmeyer, 2002; Barnett & Salomon, 2012). Majority of these studies were targeted on self-induced organisational activities classically inside the secure spherical control of the firm and have studied the internal enabler factors such as CSR (Shukla, Goel, & Tiwari, 2019), environmental management (Jain & D'lima, 2018; Fuzi, Habidin, Janudin, & Ong, 2019), green information systems (GIS) and environmental responsibility practices (Green Jr., Zelbst, Meacham, & Bhadauria, 2012) and so on.

The research and analysis of larger factors, such as sustainable supply chain management (SSCM) practices (Carter & Rogers, 2008; Varsei, Soosay, Fahimnia, & Sarkis, 2014), triple bottom line (TBL) approach (De Giovanni, 2012; Svensson et al., 2018) and organisational economic performance (Johnson & Templar, 2011) has received relatively lesser consideration in the body of literature (Hoejmose & Adrien-Kirby, 2012). Nevertheless, with the rising interest amongst various stakeholders to advance towards environmental and social practices in an integrated form, firms are now being forced to upgrade their approach towards managing their operations and supply chains (Lai, Wong, & Lam, 2015; Garza-Reyes, 2015; Cherrafi, Elfezazi, Chiarini, Mokhlis, & Benhida, 2016). In this new approach, the biggest challenge for manufacturing firms is to meet the environmental and social expectations of each stakeholder and also attain positive financial returns (Alves & Alves, 2015; Grove & Clouse, 2018).

Escalating on these gaps and limitations, in our study we hunt for the additional association of the SSCM practices, including social, governance and environmental practices on the ER of the company. The practical evidence related to these issues' criticality arises from the multiple current industry-based studies that have shown the gaining popularity of GSCM and how it remains one of the major sustainability challenges for organisations (Chang et al., 2013; Hsu et al., 2013). While multiple trends exist, the most accepted practice that supports the SSCM and TBL approaches combines social responsibility, environmental friendliness and economic growth (Fabbe-Costes, Roussat, & Colin, 2011).

Industry and academic interest in sustainable development (Paranitharan, Babu, Iskanus, & Pandi, 2018) practices have been on a rise and the recent global financial and energy crises are likely to strengthen the weight of sustainable development with corporate and government strategic objectives. The industry inclination towards SSCM is primarily due to the sustainability drivers such as increased customer awareness, regulatory pressures, and pressure from various other stakeholders such as media, non-governmental organisations (NGOs), investors (Raj, Biswas, & Srivastava, 2018).

In the last few decades global multinational companies (MNCs) such as PepsiCo, Alcoa, Nike, General Electric, Johnson & Johnson, Ford Motor Company, PG&E, Exelon, Starbucks, and Walmart have implemented SSCM practices (Confino, 2014). For example, Wal-Mart has joined with Patagonia to design and manufacture eco-friendly products and it has also increased its CSR activities to present itself as a socially responsible organization

(Makower, 2015). In India, PepsiCo was accused by several NGOs, political organisations, and the local community for misusing and overusing groundwater, leading to the depletion of water level. To address the stakeholders' concerns, PepsiCo initiated multiple CSR projects related to water conservation and waste management as part of its sustainability practices (Das & Bhunia, 2016).

Literature has shown mixed results for the association of GSCM and SRSCM practices with corporate ER. Wang and Sarkis (2017) suggested identifying and investigate the sustainability moderators and mediators to find an explanation of the discrepancies in previous research findings and to further understand the causality for such discrepancies in the relationships. In this study, along with testing the direct relationships between the different variables, we have investigated the mediation effect of CG (Mulyadi, 2018) practices on the association of green and social supply chain practices with the firms' ER.

2.1. Sustainable supply chain management (SSCM) and organisational economic returns

In literature, GSCM and SRSCM are defined in several ways (Sarkis, Zhu, & Lai, 2011). After understanding the key dimensioned discussed in existing literature (Srivastava, 2007; Seuring & Müller, 2008), we define GSCM and SRSCM "as inter-organisational activities conducted to manage different supply chain activities, starting from material sourcing till customer service, to be environmentally and socially responsive, respectively". Together GSCM and SRSCM are treated as the broader SSCM concept in this study.

As proven by multiple recent scholarly research work, a sustainability-oriented customer-supplier relationship can have a deeper association with the overall functioning of the supply chains (Vachon & Klassen, 2007; Blome, Hollos, & Paulraj, 2014). Collaborations with customers and suppliers result in sustainable process management along the supply chain - both at the upstream as well as at the downstream side of the supply chain (Vachon, 2007). Collaborations for sustainability involve the allocation of explicit resources for integrated supply chain activities to address SSCM concerns. These kinds of collaborations often require a high degree of data and information interchange to develop sustainable services and products and implement sustainable processes in the firm's supply chain (Vachon & Klassen, 2007). SSCM exhibits itself as the seamless involvement of a manufacturing firm with its customers and suppliers in developing and executing combined environmental and social solutions (Vachon & Klassen, 2008). SSCM also highlights the organisations' readiness for dedicating resources to address suppliers' and customers' sustainability objectives (Paulraj, 2011). Consequently, SSCM seldom focuses on the short-term social and environmental outcomes but it is more directed about developing environmentally sound products using socially and environmentally friendly processes (Blome et al., 2014) for achieving long term benefits.

2.2. Green (environmental) supply chain management and organisational economic returns

The GSCM practices and organisational economic returns linkage have seen greater importance in the academic literature when compared to SRSCM and organisational economic returns linkage (Seuring & Müller, 2008; Pullman, Maloni, & Carter, 2009; Hoejmose & Adrien-Kirby, 2012). The majority of the existing studies have confirmed a direct and positive association between GSCM practices and organisations' ER (Green Jr. et al., 2012; Lai et al., 2015). But in some studies, no direct significant association was found between GSCM practices and organisational ER, but then indirect associations through mediators have shown significant results (Lee, Tae Kim, & Choi, 2012; Zhu et al., 2013). Also, negative associations were found in a few studies, like in the study of Kim and Rhee (2012) on Korean manufacturers showed a negative relationship between GSCM practices and corporate ER.

Given the multitude of studies that have found a significant direct positive association between GSCM practices and firm's ER (Zhu & Sarkis, 2004; Rao & Holt, 2005; Liu, Tang, & Xue, 2012; Lai et al., 2015) we posit the initial hypothesis:

H1: Environmental performance is associated with the firm's financial performance.

2.3. Socially responsible supply chain management and organisational economic returns

Research work covering SRSCM practices and its association with organisations ER are very few (Seuring & Gold, 2013). In one of the initial attempts to test the association between organisational SRSCM practices and companies ER showed that there was no direct association between SRSCM practices and the organisation's ER, but SRSCM practices may influence the economic performance indirectly through mediators such as organisational learning (Carter, 2005). Vachon and Klassen (2007), and Kinyuira (2019) discovered the existence of a link between CG in the supply chain and the financial performance of the firm. We, therefore, hypothesize that:

H2: Social performance is associated with the firm's financial performance.

2.4. Corporate governance and organisational economic returns

The relationship between CG and firms' economic returns has started receiving significant attention, especially after the multiple financial scandals in United States (Abdulsamad, Yusoff, & Lasyoud, 2018) and some other countries (Vargas-Hernández & Teodoro Cruz, 2018). Corporate governance can trigger accelerated economic growth, increase ease of financing and reduce costs of capital ultimately leading to an increase in corporate economic performance (Pardis, Sofian, & Abdullah, 2016; Grove & Clouse, 2018). CG practices can diminish employee conflicts in the organization and thus it can save the company's financial resources which otherwise would have gone into resolving the conflicts. The organizational structure for CG can be used as the supporting infrastructure for

implementing the SSCM practices (Hapsoro & Fadhilla, 2017). Jo and Harjoto (2012) in their study found a direct and positive association between CG and corporate ER. The association between CG and SSCM practices can be either positive or negative, and it depends on firm overall performance (Arora & Dharwadkar, 2011; Uzma, 2016). Combining the literature discussed earlier in this section we posit the third hypothesis:

H3: Corporate governance is associated with the firm's financial performance.

2.5. Relationship between GSCM, SSCM, CG and organizational performance

In studies where no direct relationships were found between GSCM and SRSCM practices with the organisational ER, tests were conducted to identify any indirect relationships through mediation effect (Zhu et al., 2013). A company's CG practices can mediate the relationship of GSCM practices, and the firm's ER (Babik & Trendafilova, 2011; Crifo et al., 2016). Further, CG practices can run organisations profitably, yet in a socially and environmentally friendly way for attaining business sustainability (Williamson, Lynch-Wood, & Ramsay, 2006; Grove & Clouse, 2017). Hence we posit the next set of hypotheses:

H4a: Corporate governance mediates the relationship between green practices and the firm's financial performance.

H4b: Corporate governance mediates the relationship between social practices and the firm's financial performance.

Based on the review of the literature, four hypotheses were formulated (see Table 1).

Table 1. Research hypotheses

<i>H1</i>	Environmental performance is associated with the firm's financial performance.
<i>H2</i>	Social performance is associated with the firm's financial performance.
<i>H3</i>	Corporate governance is associated with the firm's financial performance.
<i>H4a</i>	Corporate governance mediates the relationship between green practices and the firm's financial performance.
<i>H4b</i>	Corporate governance mediates the relationship between social practices and the firm's financial performance.

3. RESEARCH METHODOLOGY

The primary objective of this study was to develop and empirically test a research model to examine the influence of SSCM practices such as GSCM, CG, and SRSCM on the ER of manufacturing companies. In this section the research methodology including data source, selection of companies, and the research model for the study are detailed.

3.1. Data source

We hypothesize that the companies practicing SSCM have stronger ER. Secondary data related to ESG is used to test the research hypotheses. The secondary data was sourced from Bloomberg's financial data terminal using 'FA ESG' function. The scores for the three ESC factors internal and external environment,

social and corporate governance were accessed from the ESG database. Bloomberg provides third-party partner data and scores. Bloomberg computes the ESG scores using its analytics tools and updates it regularly on its data terminal. Analysing the ESG scores can help in better understanding the relationships between the three ESG factors. For understanding financial performance four financial ratios - return on common equity (ROCE), return on assets (ROA), return on capital (ROC), return on invested capital (ROIC) - were used. The values for all the four financial ratios were collected from Bloomberg's Financial Analysis (FA) database.

3.2. Selection of companies

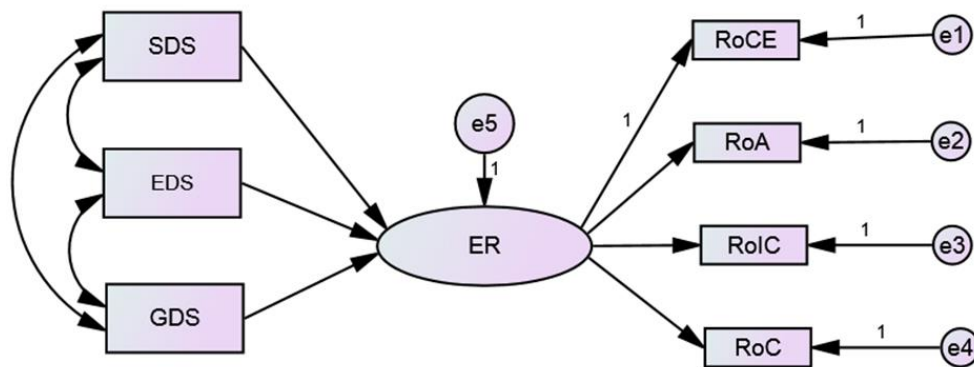
The companies selected for the study comprised of Large-Cap and Mid-Cap manufacturing companies listed on India's two popular stock exchange: 1) Bombay Stock Exchange (BSE) on the BSE-100 ESG index; and 2) National Stock Exchange (NSE) on the Nifty 100 ESG Index. The service sector companies were not considered for this study. Out of the 100 indexed companies, only 48 were identified to be manufacturing companies (see Appendix). So, data was gathered only for the 48 manufacturing companies. Even though there were just

48 companies for this study, but they all belonged to a wide array of industry sectors.

3.3. Research model

An empirical model was developed to test the research hypotheses (see Figure 1). The empirical model examines the effect of the three ESG scores - environmental disclosure score (EDS), social disclosure score (SDS), governance disclosure score (GDS) - on corporate economic returns. EDS, SDS, and GDS were identified as the independent variables for the research model, whereas ER was taken as the dependent variable. ER is a latent variable derived from the four financial ratios ROCE, ROA, ROC, and ROIC. EDS, SDS, GDS, and ER were used as proxies for environmental practices, social practices, corporate governance practices, and financial performance, respectively. The directions of the hypothesized causal paths (*H1*, *H2*, and *H3*) were empirically validated by structural equation modelling (SEM) (Fuzi et al., 2019) using AMOS 23 software. After testing the direct relationship between the dependent variables and the independent variable, a test was conducted to verify the role of CG as a mediator to the relationships of GSCM and SRSCM practices with the corporate ER.

Figure 1. Research model



Notes: environmental disclosure score - EDS; social disclosure score - SDS; governance disclosure score - GDS; return on common equity - ROCE; return on assets - ROA; return on capital - ROC; return on invested capital - ROIC; economic return - ER..

3.4. Alternative methods

3.4.1. Multivariate regression test

The influence of the environmental, social and corporate governance factors on the economic performance of the company can be tested using multivariate ordinary least squares (OLS) regression equations. Also, the data for multiple years related to the three ESG factors can be used in the OLS model. A second OLS model can be used to examines the effect of environmental, social and corporate governance factors on the changes (improvement) of corporate financial performance in one and two year time lags. The principal difference of the two OLS models is that the dependent variables in the first model use the current year's financial performance, but the dependent variable in the second model focuses on the changes of the financial performance one or two years after the

implementation of the of CG, GSCM and SRSCM practices.

3.4.2. Grounded theory-building approach

Researchers can collect and analyse the qualitative data from different manufacturing companies practicing CG, GSCM and SRSCM practices. Four-to-five archetypes of SSCM and ER can be identified and used for building working propositions. The data for the case studies could be collected through interviews or focus groups. Getting the data from multiple sources will allow the researcher to triangulate the collected information (Miles & Huberman, 1989; Eisenhardt, 1989). Multiple rounds of interviews can be conducted through site visits or telephone calls. The time for the interview may vary from 30 minutes to 1 hour. Unclear answers can be classified through emails or in follow-up questions in the subsequent rounds. For

the theory-building approach, a theoretical sampling method (Miles & Huberman, 1989; McCutcheon & Meredith, 1993) can be adopted.

4. RESULTS

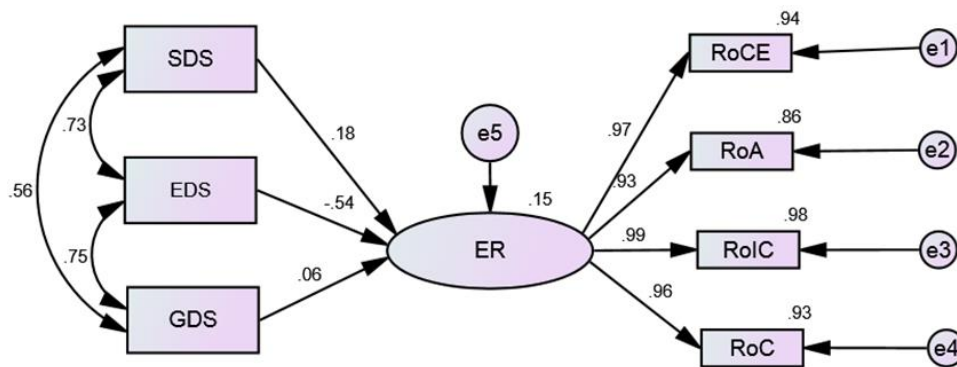
4.1. Structural equation model testing

The first three hypotheses were tested using structural equation modeling (SEM). Figure 2 illustrates the path coefficients for the SEM test. The results clearly supported H1 ($\beta = 0.18$, $p < 0.001$) which indicates that social practices positively influence the economic performance of the company. Further, the result confirmed the role of SRSCM in SSCM. As seen from the model, GSCM practices have a negative relationship with the financials of the company (H2: $\beta = -0.54$, $p < 0.001$). This means that investments on the greening of the supply chain is not giving equal or any better

returns in the financial terms and could be one of the reasons for the slow adoption of GSCM practices in India. Even though in most countries environmental initiatives in the supply chain have shown a positive relationship with the financial performance of the company, but in the study of Kim and Rhee (2012) on Korean manufacturers it has shown a negative relationship.

Previous studies have established that CG is crucial to the sustainability of a company (Russo & Fouts, 1997; Preuss, 2005). In this study, it was observed that CG positively influence the ER of a company (H3: $\beta = 0.06$, $p < 0.001$), but its standalone influence on the economic performance of a company is very limited. Hence, the role of CG practices can be further analysed to check if it can act as a mediator to enhance the influence of GSCM and SRSCM practices on organisational financial performance.

Figure 2. Hypotheses testing and path analysis



Notes: Fit indices of the measurement model: CMIN/DF = 1.138; RMSEA = .054; GFI = .935; AGFI = .834; CFI = .996; RMR = 3.089; NFI = .967; PNFI = .506; PGFI = .367

The AMOS output yielded CMIN/DF = 1.138, RMSEA = 0.054, GFI = 0.935, AGFI = 0.834, CFI = 0.996, RMR = 3.089; NFI = 0.967; which reflects an adequate model fit with the data (see Table 2). The fit indices at all the three measurement levels (absolute fit measures, incremental fit measure and parsimonious fit measures) suggest that the model is a good fit to the data.

Table 2. Model fit indices (SEM)

Index	Score	Recommended value	Reference
Absolute fit measures			
CMIN/DF	1.138	1.0 to 5.0 is an acceptable fit	Hair, Black, Babin, & Anderson (2010)
RMSEA	0.054	RMSEA < 0.08 acceptable fit and < 0.06 is good fit	Hair et al. (2010); Awang (2012)
GFI	0.935	NFI > 0.9 means satisfactory fit	Hair et al. (2010); Awang (2012)
Incremental fit measure			
NFI	0.967	NFI > 0.9 means satisfactory fit	Hair et al. (2010); Awang (2012)
Parsimonious fit measures			
PNFI	0.506	Acceptable, over 0.50	Hair et al. (2010)
CFI	0.996	CFI > 0.95 means satisfactory fit	Hair et al. (2010); Awang (2012)

The correlations between the different sustainability factors ranged from 0.56 to 0.75, which means there exists a strong association between GSCM, SRSCM, and CG. Also, EDS (environmental practices) is the most influencing factor between the three sustainability variable, with a very strong correlation with SDS (social practices) and GDS (corporate governance practices) with correlation values of 0.73 and 0.75 respectively (see Figure 2).

4.2. Mediation analysis

As CG showed a weak relationship with the economic performance of the company, we further investigated the role of CG as a mediator to influence the relations of GSCM and SRSCM practices with corporate ER. Three different tests were conducted to understand and validate the mediating effect of CG practices on the relationship of GSCM practices and SRSCM practices with corporate ER (Hadi, Suryanto, & Hussain, 2016). The three techniques used were 1) Baron and Kenny's (1986) mediation analysis, 2) Sobel T-test (1982), and 3) Preacher and Hayes's (2004, 2008) mediation test.

4.2.1. Baron and Kenny’s mediation analysis

Below is the step-by-step presentation of the Baron and Kenny’s mediation analysis:

- Step 1: Independent variable (X) → Dependent variable (Y) [Direct effect]
 - EDS → ER ($\beta = - 0.35$); SDS → ER ($\beta = - 0.18$)
- Step 2: Independent variable (X) → Mediating variable (M) [Indirect effect]
 - EDS → GDS ($\beta = 0.71$); SDS → GDS ($\beta = 0.26$)
- Step 3: Mediating variable (M) → Dependent variable (Y) [Indirect effect]
 - GDS → ER ($\beta = - 0.29$)
- Step 4: X (and M) → Y (both direct and indirect).

Environmental practices and corporate economic performance

- EDS → ER ($\beta = - 0.34$); EDS → GDS ($\beta = 0.71$); GDS → ER ($\beta = - 0.01$)

H4a: No significant change in the β -value for the relationship between GSCM practices and corporate ER. Hence, only the direct effect and no indirect effect. Hence, CG has no mediation effect on the relationship of GSCM practices and ER.

Social practices and corporate economic performance

- SDS → ER ($\beta = - 0.06$); SDS → GDS ($\beta = 0.55$); GDS → ER ($\beta = - 0.22$)

H4b: A significant change in the β -value for the relationship between SRSCM practices and corporate ER. Hence, no direct effect and only indirect effect. Hence, CG mediates the relation of SRSCM practices and ER.

From the Baron and Kenny’s (1986) mediation analysis it was found that CG practices have no mediation impact on the relationship between GSCM and firm’s ER. At the same time, CG showed a mediation effect on the relationship between SRSCM and corporate ER.

4.2.2. The Sobel T-test

To find the strength of the mediation effect, Baron and Kenny (1986) and Kenny et al., (1998) promoted the Sobel T-test (Pardo and Roman, 2013). This test measures the strength of mediation if an inter-mediation effect is significant. The Sobel T-test confirmed the findings from Baron and Kenny’s (1986) method. It showed a significant T-statistics value of 2.33 ($p = 0.02$) for the mediation effect of CG practices on the relationship between SRSCM practices and corporate ER, whereas an insignificant T-statistics value of 0.03 ($p = 0.98$) for the mediation effect of CG practices on the relationship between GSCM practices and corporate ER (see Table 3).

Table 3. Sobel T-test

Mediation effect for:	SDS → ER	EDS → ER
Sobel test statistic	2.33199534	0.02528072
One-tailed probability	0.00985047	0.48991552
Two-tailed probability	0.01970094	0.97983105

4.2.3 Preacher and Hayes mediation test

Preacher and Hayes’s mediation method is a non-parametric resampling test. The advantage of using this test for mediation analysis is, it does not depend on the basic assumption of normality, and therefore it is also suitable for samples with smaller in size (Pardo & Roman, 2013; Hair Jr, Hult, Ringle, & Sarstedt, 2016). The key advantage of this test over Sobel’s test is it can establish the mediation effect with complete certainty. According to Preacher and Hayes’s mediation method (Hayes & Preacher, 2014), “if the direct path is not significant, there will be no mediating effect” (Wong, 2016, p. 15; Hair et al., 2016, p. 238). But, if the direct path is significant, we calculate the variance accounted for (VAF) values. According to Hair et al. (2010), “a VAF value greater than 80% means a full mediation effect; a value between 20% and 80% is partial mediation effect; a value less than 20% means there is no mediation effect” (p. 115). VAF can be calculated using the formula:

$$VAF = (P_{IV \rightarrow DV} \times P_{M \rightarrow DV}) / ((P_{IV \rightarrow DV} \times P_{M \rightarrow DV}) + P_{IV \rightarrow DV}) \quad (1)$$

where P stands for path coefficient, IV is the independent variable, M is the moderating variable and DV is the dependent variable.

The VAF values for the two relations SDS → ER and EDS → ER are 67% (between 20% and 80%) and 1% (less than 20%) respectively. This means there is a partial mediation effect on the relationship of SRSCM practices and corporate ER because of CG practices at the same time there is no mediation effect of CG practices on the relationship between GSCM practices and corporate ER. Table 4 summarizes the outcomes of hypotheses testing.

Table 4. Hypotheses testing

Hypothesis	Result
H1: Environmental performance is associated with the firm’s financial performance.	Supported
H2: Social performance is associated with the firm’s financial performance.	Supported
H3: Corporate governance is associated with the firm’s financial performance.	Supported
H4a: Corporate governance mediates the relationship between green practices and the firm’s financial performance.	Not supported
H4b: Corporate governance mediates the relationship between social practices and the firm’s financial performance.	Supported

5. DISCUSSION

In this study, it was found that only 15 percent of the variance in the ER of the companies is explained by the three sustainability factors EDS, SDS and GDS (refer Table 5). This means the influence of the SSCM practices on the corporate ER is very limited. But at the same time, all three factors have a significant relationship with the firm’s ER. SRSCM and CG are positively related to the companies ER. GSCM practices are negatively related to the companies ER.

Table 5. Model summary

<i>Measure</i>	<i>What does it measure</i>	<i>Result of the study</i>
Target endogenous variable	Coefficient of determination (R^2)	R^2 (economic performance) = 0.15
Hypotheses testing	Structural equation modelling (SEM)	P -values for all the hypothesized direct paths are < 0.05 and hence statistically significant

There are good numbers of probable reasons for the varied outcomes, but if we look overall, the mixed outcomes are somewhat in-line with the previous findings on ESG practices and organisational financial performance (Wagner et al., 2002; Barnett & Salomon, 2012; Grove & Clouse, 2018). One of the most interesting and robust findings of the study was a significant negative relationship between GSCM practices and organisational ER. Wang and Sarkis (2013) have explained some reasons for such an unexpected finding of a negative association between GSCM practices and organisational ER like: 1) organisations are not motivated towards implementing environmentally-oriented supply chain practices; 2) the organisations may be driven by various external pressures, especially by financial pressures, to reduce their risk and liability and are therefore transferring their environmental burdens to the other minor supply chain partners to improve their operational performance; and 3) if organisations are implementing only GSCM and no other program, then they may be new to implementing SSCM initiatives which might be resulting in financial losses. Therefore, undoubtedly the mixed findings require further investigation and this study is just a help to set the stage for more robust research work in this field.

In line with the findings of Carter (2005), the direct effect of SRSCM practices on the ER was weak, but with the mediation of CG, the relationship improved significantly. CG acted as a good mediator for the relationship between SRSCM performance and the financial performance of the company. But, CG failed to mediate the relationship between GSCM practices and economic performance. This contrasted from the earlier research findings by Babiak and Trendafilova (2011) and Crifo et al. (2016) where CG practices mediated the relationship between GSCM practices and the firm's ER. Further, a detailed investigation involving data from multiple geographic locations can help in understanding the key reasons for such deviations in the findings.

6. CONCLUSION

This study is an effort towards understanding the role of green practices, social management and corporate governance activities in improving the economic performance of Indian manufacturing companies. The results were based on the analysis of data collected from secondary data sources: Bloomberg's Financial Analysis (FA), and Environmental, Social, and Governance (ESG) databases. The benefit of using secondary data sources is, researchers can easily replicate the study

in the future at different geographies using the same data source. Researchers can further try comparative studies with multiple geographies for gaining a deeper understanding of the association of GSCM, SRSCM, and CG with the firm's ER. Also, by using Bloomberg's database researchers can overcome the common problems related to survey research, such as sampling bias, the bias in data collection, non-response error.

In the developed countries ESG disclosure is an important factor that influences a company's brand reputation, expansion plan, investment decision making and competitive advantage (Tamimi & Sebastianelli, 2017; Grove & Clouse, 2018). Kotsantonis, Pinney, and Serafeim (2016) demystified several prevalent myths about ESG integration with corporate financial management. They argued that incorporating ESG into mainstream decision making is yet uncommon across all industry sectors. The study by Tamimi and Sebastianelli (2017) revealed that organizations are most transparent for CG disclosures as in most countries there are regulations in place that mandate them to disclose information related to CG and financial performance metrics. Surprising, in this study, CG had very little impact on the ER of Indian manufacturing companies. Although significant deficiencies exist in the companies' discloser information related to social and environmental practices, these two factors showed a comparatively stronger relationship with the companies' financial results. In contrast to the study by Tamimi and Sebastianelli (2017) conducted on US manufacturing companies where environmental factors had the lowest influence, the results for Indian manufacturing companies showed a strong negative influence of environmental practices on firm's ER. Therefore, multinational companies (MNCs) planning to expand their operations to India should formulate different ESC strategy for Indian operations than what they are used to.

This study is a contribution to the body of literature in multiple ways. First, it is more wide-ranging because it is based on metrics that include all three ESG dimensions. Secondly, the role of CG as a moderator for investigating the relationship of GSCM and SRSCM with the firm's ER is tested very first time on Indian manufacturing companies. The findings of the research will help practitioners to focus and practice different strategies to improve their firm's ER. This study could be extremely useful for firms that are exerting pressure on GSCM and SRSCM and are not getting the desired outcomes. The study can further help the managers and executives of such firms to prioritize their efforts for attaining better ER.

The results of this study were based on 48 manufacturing companies which are indexed on S&P BSE-100 ESG index and Nifty 100 ESG Index and are Large-Cap and Mid-Cap companies, researchers can further extend this study by including Small-Cap companies. The researchers can also replicate the research work using primary data to make the study more comprehensive with a larger sample size involving more industry sectors.

REFERENCES

1. Abdulsamad, A. O., Yusoff, W. F. W., & Lasyoud, A. A. (2018). The influence of the board of directors' characteristics on firm performance: Evidence from Malaysian public listed companies. *Corporate Governance and Sustainability Review*, 2(1), 6-13. <http://doi.org/10.22495/cgsrv2i1p1>
2. Alves, J. R. X., & Alves, J. M. (2015). Production management model integrating the principles of lean manufacturing and sustainability supported by the cultural transformation of a company. *International Journal of Production Research*, 53(17), 5320-5333. <https://doi.org/10.1080/00207543.2015.1033032>
3. Ameer, R., & Othman, R. (2012). Sustainability practices and corporate financial performance: A study based on the top global corporations. *Journal of Business Ethics*, 108(1), 61-79. <https://doi.org/10.1007/s10551-011-1063-y>
4. Ariely, D., Bracha, A., & Meier, S. (2009). Doing good or doing well? Image motivation and monetary incentives in behaving prosocially. *American Economic Review*, 99(1), 544-555. <https://doi.org/10.1257/aer.99.1.544>
5. Arora, P., & Dharwadkar, R. (2011). Corporate governance and corporate social responsibility (CSR): The moderating roles of attainment discrepancy and organization slack. *Corporate Governance: An International Review*, 19(2), 136-152. <https://doi.org/10.1111/j.1467-8683.2010.00843.x>
6. Awang, Z. (2012). *Structural equation modeling using AMOS graphic*. Shah Alam, Malaysia: Penerbit Universiti Teknologi MARA.
7. Babiak, K., & Trendafilova, S. (2011). CSR and environmental responsibility: Motives and pressures to adopt green management practices. *Corporate Social Responsibility and Environmental Management*, 18(1), 11-24. <https://doi.org/10.1002/csr.229>
8. Barcos, L., Barroso, A., Surroca, J., & Tribo, J. A. (2013). Corporate social responsibility and inventory policy. *International Journal of Production Economics*, 143(2), 580-588. <https://doi.org/10.1016/j.ijpe.2012.04.005>
9. Barnett, M. L., & Salomon, R. M. (2006). Beyond dichotomy: The curvilinear relationship between social responsibility and financial performance. *Strategic Management Journal*, 27(11), 1101-1122. <https://doi.org/10.1002/smj.557>
10. Barnett, M. L., & Salomon, R. M. (2012). Does it pay to be really good? Addressing the shape of the relationship between social and financial performance. *Strategic Management Journal*, 33(11), 1304-1320. <https://doi.org/10.1002/smj.1980>
11. Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182. <https://doi.org/10.1037//0022-3514.51.6.1173>
12. Blome, C., Hollos, D., & Paulraj, A. (2014). Green procurement and green supplier development: Antecedents and effects on supplier performance. *International Journal of Production Research*, 52(1), 32-49. <https://doi.org/10.1080/00207543.2013.825748>
13. Brammer, S., & Millington, A. (2008). Does it pay to be different? An analysis of the relationship between corporate social and financial performance. *Strategic Management Journal*, 29(12), 1325-1343. <https://doi.org/10.1002/smj.714>
14. Carter, C. R. (2005). Purchasing social responsibility and firm performance: The key mediating roles of organizational learning and supplier performance. *International Journal of Physical Distribution & Logistics Management*, 35(3), 177-194. <https://doi.org/10.1108/09600030510594567>
15. Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: Moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, 38(5), 360-387. <https://doi.org/10.1108/09600030810882816>
16. Cavaco, S., & Crifo, P. (2014). CSR and financial performance: Complementarity between environmental, social and business behaviours. *Applied Economics*, 46(27), 3323-3338. <https://doi.org/10.1080/00036846.2014.927572>
17. Chang, B.-Y., Kenzhekhanuly, Y., & Park, B. (2013). A study on determinants of green supply chain management practice. *International Journal of Control and Automation*, 6(3), 199-208. Retrieved from http://article.nadiapub.com/IJCA/vol6_no3/18.pdf
18. Cherrafi, A., Elfezazi, S., Chiarini, A., Mokhlis, A., & Benhida, K. (2016). The integration of lean manufacturing, Six Sigma and sustainability: A literature review and future research directions for developing a specific model. *Journal of Cleaner Production*, 139, 828-846. <https://doi.org/10.1016/j.jclepro.2016.08.101>
19. Chien, M. K., & Shih, L. H. (2007). An empirical study of the implementation of green supply chain management practices in the electrical and electronic industry and their relation to organizational performances. *International Journal of Environmental Science and Technology*, 4(3), 383-394. Retrieved from <http://www.bioline.org.br/pdf?st07049>
20. Christmann, P. (2000). Effects of "best practices" of environmental management on cost advantage: The role of complementary assets. *Academy of Management Journal*, 43(4), 663-680. <https://doi.org/10.5465/1556360>
21. Confino, J. (2014, April 30). Best practices in sustainability: Ford, Starbucks and more. *The Guardian*. Retrieved from <https://www.theguardian.com/sustainable-business/blog/best-practices-sustainability-us-corporations-ceres>
22. Crifo, P., Diaye, M.-A., & Pekovic, S. (2016). CSR related management practices and firm performance: An empirical analysis of the quantity-quality trade-off on French data. *International Journal of Production Economics*, 171(3), 405-416. <https://doi.org/10.1016/j.ijpe.2014.12.019>
23. Das, L., & Bhunia, A. (2016). The impact of CSR on firms' financial performance - A literature review. *American Journal of Business, Economics and Management*, 4(4), 66-74. Retrieved from <http://www.openscienceonline.com/author/download?paperId=3413&stateId=8000&fileType=3>
24. De Giovanni, P. (2012). Do internal and external environmental management contribute to the triple bottom line? *International Journal of Operations & Production Management*, 32(3), 265-290. <https://doi.org/10.1108/01443571211212574>
25. Eisenhardt, K. M. (1989). Building theories from case study research. *The Academy of Management Review*, 14(4), 532-550. <https://doi.org/10.2307/258557>

26. Fabbe-Costes, N., Roussat, C., & Colin, J. (2011). Future sustainable supply chains: What should companies scan? *International Journal of Physical Distribution & Logistics Management*, 41(3), 228-252. <https://doi.org/10.1108/09600031111123778>
27. Falck, O., & Hebllich, S. (2007). Corporate social responsibility: Doing well by doing good. *Business Horizons*, 50(3), 247-254. <https://doi.org/10.1016/j.bushor.2006.12.002>
28. Fuzi, N. M., Habidin, N. F., Janudin, S. E., & Ong, S. Y. Y. (2019). Environmental management accounting practices, environmental management system and environmental performance for the Malaysian manufacturing industry. *International Journal of Business Excellence*, 18(1), 120-136. <https://doi.org/10.1504/ijbex.2019.10020908>
29. Garza-Reyes, J. A. (2015). Lean and green - A systematic review of the state of the art literature. *Journal of Cleaner Production*, 102, 18-29. <https://doi.org/10.1016/j.jclepro.2015.04.064>
30. Ghauri, P. N., & Grønhaug, K. (2005). *Research methods in business studies: A practical guide*. London, the UK: Pearson Education.
31. Green Jr, K. W., Zelbst, P. J., Meacham, J., & Bhadauria, V. S. (2012). Green supply chain management practices: Impact on performance. *Supply Chain Management*, 17(3), 290-305. <https://doi.org/10.1108/13598541211227126>
32. Grove, H., & Clouse, M. (2017). Corporate governance principles and sustainability. *Corporate Governance and Sustainability Review*, 1(2), 13-19. <http://doi.org/10.22495/cgsrv1i2p2>
33. Grove, H., & Clouse, M. (2018). Focusing on sustainability to strengthen corporate governance. *Corporate Governance and Sustainability Review*, 2(2), 38-47. <http://doi.org/10.22495/cgsrv2i2p4>
34. Hadi, A. R. A., Suryanto, T., & Hussain, M. A. (2016). Corporate governance mechanism on the practice of international financial reporting standards (IFRS) among Muslim entrepreneurs in textile industry - The case of Malaysia. *International Journal of Economic Perspectives*, 10(2), 164-170.
35. Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Thousand Oaks, CA, the USA: Sage Publications.
36. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective*. Upper Saddle River, NJ, the USA: Pearson Prentice Hall.
37. Hapsoro, D., & Fadhilla, A. F. (2017). Relationship analysis of corporate governance, corporate social responsibility disclosure and economic consequences: Empirical study of Indonesia capital market. *The South East Asian Journal of Management*, 11(2), 164-182. <https://doi.org/10.21002/seam.v11i2.8526>
38. Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology*, 67(3), 451-470. <https://doi.org/10.1111/bmsp.12028>
39. Hojmosse, S. U., & Adrien-Kirby, A. J. (2012). Socially and environmentally responsible procurement: A literature review and future research agenda of a managerial issue in the 21st century. *Journal of Purchasing and Supply Management*, 18(4), 232-242. <https://doi.org/10.1016/j.pursup.2012.06.002>
40. Hofer, C., Cantor, D. E., & Dai, J. (2012). The competitive determinants of a firm's environmental management activities: Evidence from US manufacturing industries. *Journal of Operations Management*, 30(1-2), 69-84. <https://doi.org/10.1016/j.jom.2011.06.002>
41. Hsu, C. C., Choon Tan, K., Hanim Mohamad Zailani, S., & Jayaraman, V. (2013). Supply chain drivers that foster the development of green initiatives in an emerging economy. *International Journal of Operations & Production Management*, 33(6), 656-688. <https://doi.org/10.1108/ijopm-10-2011-0401>
42. Jain, N., & D'lima, C. (2018). Green HRM - A study on the perception of Generation Y as prospective internal customers. *International Journal of Business Excellence*, 15(2), 199-208. <https://doi.org/10.1504/ijbex.2018.091916>
43. Jasim, K. M., & Paramasivan, T. (2017). Ecological, green marketing and green supply chain problems - Fish marketing societies in Tamilnadu coastal areas. *International Journal of Business Excellence*, 13(4), 546-562. <https://doi.org/10.1504/ijbex.2017.10008218>
44. Jo, H., & Harjoto, M. A. (2012). The causal effect of corporate governance on corporate social responsibility. *Journal of Business Ethics*, 106(1), 53-72. <https://doi.org/10.1007/s10551-011-1052-1>
45. Johnson, M., & Templar, S. (2011). The relationships between supply chain and firm performance: The development and testing of a unified proxy. *International Journal of Physical Distribution & Logistics Management*, 41(2), 88-103. <https://doi.org/10.1108/09600031111118512>
46. Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. Gilbert, S. Fiske, and G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., pp. 233-265). Retrieved from http://www.columbia.edu/~nb2229/docs/KennyKashyBolger1998-Data_analysis.pdf
47. Kim, J., & Rhee, J. (2012). An empirical study on the impact of critical success factors on the balanced scorecard performance in Korean green supply chain management enterprises. *International Journal of Production Research*, 50(9), 2465-2483. <https://doi.org/10.1080/00207543.2011.581009>
48. Kinyuira, D. K. (2019). Social performance rating in co-operatives. *Corporate Governance and Sustainability Review*, 3(2), 18-25. <http://doi.org/10.22495/cgsrv3i2p2>
49. Kotsantonis, S., Pinney, C., & Serafeim, G. (2016). ESG integration in investment management: Myths and realities. *Journal of Applied Corporate Finance*, 28(2), 10-16. Retrieved from https://www.academia.edu/35468994/JACF_ESG_Integration_in_Investment_Management_Myths_and_Realities
50. Lai, K.-H., Wong, C. W. Y., & Lam, J. S. L. (2015). Sharing environmental management information with supply chain partners and the performance contingencies on environmental munificence. *International Journal of Production Economics*, 164, 445-453. <https://doi.org/10.1016/j.ijpe.2014.12.009>
51. Lee, S. M., Tae Kim, S., & Choi, D. (2012). Green supply chain management and organizational performance. *Industrial Management & Data Systems*, 112(8), 1148-1180. <https://doi.org/10.1108/02635571211264609>
52. Lee, S.-Y. (2008). Drivers for the participation of small and medium-sized suppliers in green supply chain initiatives. *Supply Chain Management*, 13(3), 185-198. <https://doi.org/10.1108/13598540810871235>
53. Liu, L., Tang, M., & Xue, F. (2012). The impact of manufacturing firms' green supply chain management on competitive advantage. *Advanced Materials Research*, 472-475, 3349-3354. <https://doi.org/10.4028/www.scientific.net/amr.472-475.3349>

54. Luthra, S., Kumar, V., Kumar, S., & Haleem, A. (2011). Barriers to implement green supply chain management in automobile industry using interpretive structural modeling technique: An Indian perspective. *Journal of Industrial Engineering and Management (JIEM)*, 4(2), 231-257. <https://doi.org/10.3926/jiem.2011.v4n2.p231-257>
55. Makower, J. (2015, November 17). Walmart sustainability at 10: An assessment. *GreenBiz*. Retrieved from <https://www.greenbiz.com/article/walmart-sustainability-10-assessment>
56. Margolis, J. D., Elfenbein, H. A., & Walsh, J. P. (2009). *Does it pay to be good...and does it matter? A meta-analysis of the relationship between corporate social and financial performance*. <https://doi.org/10.2139/ssrn.1866371>
57. McCutcheon, D. M., & Meredith, J. R. (1993). Conducting case study research in operations management. *Journal of Operations Management*, 11(3), 239-256. [https://doi.org/10.1016/0272-6963\(93\)90002-7](https://doi.org/10.1016/0272-6963(93)90002-7)
58. McWilliams, A., & Siegel, D. (2000). Corporate social responsibility and financial performance: Correlation or misspecification? *Strategic Management Journal*, 21(5), 603-609. [https://doi.org/10.1002/\(sici\)1097-0266\(200005\)21:5%3C603::aid-smj101%3E3.3.co;2-v](https://doi.org/10.1002/(sici)1097-0266(200005)21:5%3C603::aid-smj101%3E3.3.co;2-v)
59. Miles, M., & Huberman, M. (1989). Some procedures for causal analysis of multiple-case data. *International Journal of Qualitative Studies in Education*, 2(1), 55-68. <https://doi.org/10.1080/0951839890020106>
60. Mudgal, R. K., Shankar, R., Talib, P., & Raj, T. (2009). Greening the supply chain practices: An Indian perspective of enablers' relationships. *International Journal of Advanced Operations Management*, 1(2-3), 151-176. <https://doi.org/10.1504/ijaom.2009.030671>
61. Muduli, K., Biswal, J. N., Satapathy, S., Barve, A., & Tripathy, S. (2017). Investigation of influential factors of green supply chain management in Indian mining industries: An empirical study. *International Journal of Business Excellence*, 12(3), 351-375. <https://doi.org/10.1504/ijbex.2017.10005088>
62. Mulyadi, M. S. (2018). Developing corporate governance in Myanmar - Lessons learned from corporate governance development in Indonesia. *International Journal of Business Excellence*, 14(3), 414-425. <https://doi.org/10.1504/ijbex.2018.10010424>
63. Narasimhan, R. & Carter, J. R. (1998). *Environmental supply chain management*. Tempe, AZ, the USA: Center for Advanced Purchasing Studies
64. Orlitzky, M., Schmidt, F. L., & Rynes, S. L. (2003). Corporate social and financial performance: A meta-analysis. *Organization Studies*, 24(3), 403-441. <https://doi.org/10.1177/0170840603024003910>
65. Paranitharan, K. P., Babu, T. R., Iskanius, P., & Pandi, A. P. (2018). An integrated model for achieving sustainability in the manufacturing industry - An empirical study. *International Journal of Business Excellence*, 16(1), 82-109. <https://doi.org/10.1504/ijbex.2018.10015766>
66. Pardis, S. T., Sofian, S., & Abdullah, D. F. (2016). An integrative proposed model of corporate governance: The corporate governance mechanisms mediates the relationship between board intellectual capital and corporate performance. *International Journal of Economics and Financial Issues*, 6(3S), 70-75. Retrieved from https://www.researchgate.net/publication/304526298_International_Journal_of_Economics_and_Financial_Issues_An_Integrative_Proposed_Model_of_Corporate_Governance_The_Corporate_Governance_Mechanisms_Mediates_the_Relationship_between_Board_Intellectual_Capital_and_Corporate_Performance
67. Pardo, A., & Román, M. (2013). Reflections on the Baron and Kenny model of statistical mediation. *Anales de Psicología*, 29(2), 614-623. <https://doi.org/10.6018/analesps.29.2.139241>
68. Paulraj, A. (2011). Understanding the relationships between internal resources and capabilities, sustainable supply management and organizational sustainability. *Journal of Supply Chain Management*, 47(1), 19-37. <https://doi.org/10.1111/j.1745-493x.2010.03212.x>
69. Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36(4), 717-731. <https://doi.org/10.3758/bf03206553>
70. Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891. <https://doi.org/10.3758/brm.40.3.879>
71. Preuss, L. (2005). Rhetoric and reality of corporate greening: A view from the supply chain management function. *Business Strategy and the Environment*, 14(2), 123-139. <https://doi.org/10.1002/bse.435>
72. Pullman, M. E., Maloni, M. J., & Carter, C. R. (2009). Food for thought: Social versus environmental sustainability practices and performance outcomes. *Journal of Supply Chain Management*, 45(4), 38-54. <https://doi.org/10.1111/j.1745-493x.2009.03175.x>
73. Raj, A., Biswas, I., & Srivastava, S. K. (2018). Designing supply contracts for the sustainable supply chain using game theory. *Journal of Cleaner Production*, 185, 275-284. <https://doi.org/10.1016/j.jclepro.2018.03.046>
74. Rao, P., & Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance? *International Journal of Operations & Production Management*, 25(9), 898-916. <https://doi.org/10.1108/01443570510613956>
75. Russo, M. V., & Fouts, P. A. (1997). A resource-based perspective on corporate environmental performance and profitability. *Academy of Management*, 40(3), 534-559. <https://doi.org/10.2307/257052>
76. Sarand, V. F., Barzoki, A. S., & Teimouri, H. (2019). Evaluating impact of corporate social responsibility on organisational identity with the mediating role of ethical climate. *International Journal of Business Excellence*, 17(2), 171-188. <https://doi.org/10.1504/ijbex.2019.10018694>
77. Sarkis, J., Zhu, Q., & Lai, K.-H. (2011). An organizational theoretic review of green supply chain management literature. *International Journal of Production Economics*, 130(1), 1-15. <https://doi.org/10.1016/j.ijpe.2010.11.010>
78. Seuring, S., & Gold, S. (2013). Sustainability management beyond corporate boundaries: From stakeholders to performance. *Journal of Cleaner Production*, 56, 1-6. <https://doi.org/10.1016/j.jclepro.2012.11.033>
79. Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 16(15), 1699-1710. <https://doi.org/10.1016/j.jclepro.2008.04.020>
80. Shukla, A., Goel, G., & Tiwari, N. (2019). Consumer perception of corporate social responsibility and purchase behaviour. *International Journal of Business Excellence*, 18(1), 22-41. <https://doi.org/10.1504/ijbex.2019.10020904>

81. Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, 13, 290-312. <https://doi.org/10.2307/270723>
82. Srivastava, S. K. (2007). Green supply-chain management: A state-of-the-art literature review. *International Journal of Management Reviews*, 9(1), 53-80. <https://doi.org/10.1111/j.1468-2370.2007.00202.x>
83. Surroca, J., Tribó, J. A., & Waddock, S. (2010). Corporate responsibility and financial performance: The role of intangible resources. *Strategic Management Journal*, 31(5), 463-490. <https://doi.org/10.1002/smj.820>
84. Svensson, G., Ferro, C., Høgevold, N., Padin, C., Varela, J. C. S., & Sarstedt, M. (2018). Framing the triple bottom line approach: Direct and mediation effects between economic, social and environmental elements. *Journal of Cleaner Production*, 197, 972-991. <https://doi.org/10.1016/j.jclepro.2018.06.226>
85. Tamimi, N., & Sebastianelli, R. (2017). Transparency among S&P 500 companies: An analysis of ESG disclosure scores. *Management Decision*, 55(8), 1660-1680. <https://doi.org/10.1108/md-01-2017-0018>
86. Uzma, S. H. (2016). Embedding corporate governance and corporate social responsibility in emerging countries. *International Journal of Law and Management*, 58(3), 299-316. <https://doi.org/10.1108/ijlma-04-2015-0015>
87. Vachon, S. (2007). Green supply chain practices and the selection of environmental technologies. *International Journal of Production Research*, 45(18-19), 4357-4379. <https://doi.org/10.1080/00207540701440303>
88. Vachon, S., & Klassen, R. D. (2007). Supply chain management and environmental technologies: The role of integration. *International Journal of Production Research*, 45(2), 401-423. <https://doi.org/10.1080/00207540600597781>
89. Vachon, S., & Klassen, R. D. (2008). Environmental management and manufacturing performance: The role of collaboration in the supply chain. *International Journal of Production Economics*, 111(2), 299-315. <https://doi.org/10.1016/j.ijpe.2006.11.030>
90. Vargas-Hernández, J. G., & Teodoro Cruz, M. E. (2018). Corporate governance and agency theory: Megacable case. *Corporate Governance and Sustainability Review*, 2(1), 59-69. <http://doi.org/10.22495/cgsrv2i1p5>
91. Varsei, M., Soosay, C., Fahimnia, B., & Sarkis, J. (2014). Framing sustainability performance of supply chains with multidimensional indicators. *Supply Chain Management: An International Journal*, 19(3), 242-257. <https://doi.org/10.1108/scm-12-2013-0436>
92. Wagner, M., Van Phu, N., Azomahou, T., & Wehrmeyer, W. (2002). The relationship between the environmental and economic performance of firms: An empirical analysis of the European paper industry. *Corporate Social Responsibility and Environmental Management*, 9(3), 133-146. <https://doi.org/10.1002/csr.22>
93. Wang, Z., & Sarkis, J. (2013). Investigating the relationship of sustainable supply chain management with corporate financial performance. *International Journal of Productivity and Performance Management*, 62(8), 871-888. <https://doi.org/10.1108/ijppm-03-2013-0033>
94. Wang, Z., & Sarkis, J. (2017). Corporate social responsibility governance, outcomes, and financial performance. *Journal of Cleaner Production*, 162, 1607-1616. <https://doi.org/10.1016/j.jclepro.2017.06.142>
95. Williamson, D., Lynch-Wood, G., & Ramsay, J. (2006). Drivers of environmental behaviour in manufacturing SMEs and the implications for CSR. *Journal of Business Ethics*, 67(3), 317-330. <https://doi.org/10.1007/s10551-006-9187-1>
96. Wong, K. K.-K. (2016). Technical note: Mediation analysis, categorical moderation analysis, and higher-order constructs modeling in Partial Least Squares Structural Equation Modeling (PLS-SEM): A B2B example using SmartPLS. *Marketing Bulletin*, 26, 1-22. Retrieved from https://www.researchgate.net/profile/Ken_Wong10/publication/303402222_TECHNICAL_NOTE_Mediation_analysis_categorical_moderation_analysis_and_higher-order_constructs_modeling_in_Partial_Least_Squares_Structural_Equation_Modeling_PLS-SEM_A_B2B_Example_using_SmartPLS/links/5741164008ae9f741b34e577/TECHNICAL-NOTE-Mediation-analysis-categorical-moderation-analysis-and-higher-order-constructs-modeling-in-Partial-Least-Squares-Structural-Equation-Modeling-PLS-SEM-A-B2B-Example-using-SmartPLS.pdf
97. Yeung, S. M.-C. (2019). UNSDGs and future quality management - Social policy for developing sustainable development mindset. *Corporate Governance and Sustainability Review*, 3(2), 26-34. <http://doi.org/10.22495/cgsrv3i2p3>
98. Zhu, Q., & Sarkis, J. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management*, 22(3), 265-289. <https://doi.org/10.1016/j.jom.2004.01.005>
99. Zhu, Q., & Sarkis, J. (2006). An inter-sectoral comparison of green supply chain management in China: Drivers and practices. *Journal of Cleaner Production*, 14(5), 472-486. <https://doi.org/10.1016/j.jclepro.2005.01.003>
100. Zhu, Q., Sarkis, J., & Geng, Y. (2005). Green supply chain management in China: Pressures, practices and performance. *International Journal of Operations & Production Management*, 25(5), 449-468. <https://doi.org/10.1108/01443570510593148>
101. Zhu, Q., Cordeiro, J., & Sarkis, J. (2013). Institutional pressures, dynamic capabilities and environmental management systems: Investigating the ISO 9000 - Environmental management system implementation linkage. *Journal of Environmental Management*, 114, 232-242. <https://doi.org/10.1016/j.jenvman.2012.10.006>
102. Zhu, Q., Dou, Y., & Sarkis, J. (2010). A portfolio-based analysis for green supplier management using the analytical network process. *Supply Chain Management*, 15(4), 306-319. <https://doi.org/10.1108/13598541011054670>

APPENDIX

Table A.1. List of companies' part of this study

Company	Industry
Ambuja Cements Ltd	Cement
Asian Paints Ltd	Paint
Aurobindo Pharma Ltd	Pharmaceuticals
Bajaj Auto Ltd	Automobile
Bharat Electronics Ltd	Electronics
Bharat Forge Ltd	Forging
Bharat Heavy Electrical Ltd	Heavy electrical
Biocon Ltd	Pharmaceuticals
Bosch Ltd	Engineering and technology
Britannia Industries Ltd	Food products
Cadila Healthcare Ltd	Pharmaceuticals
Cipla Ltd	Pharmaceuticals
Coal India Ltd	Mining
Colgate-Palmolive India Ltd	FMCG
Dabur India Ltd	FMCG
Dr Reddy's Laboratories Ltd	Pharmaceuticals
Exide Industries Ltd	Batteries
GAIL India Ltd	Oil and gas
Godawari Power and Ispat Ltd	Metallurgical
Godrej consumers Products Ltd	FMCG
Graphite India Ltd	Mining
Havells India Ltd	Electricals
Hero MotoCorp Ltd	Automobile
Hindalco Industries Ltd	Metallurgical
Hindustan Unilever Ltd	FMCG
ITC Ltd	FMCG
JSW Steel Ltd	Metallurgical
Lupin Ltd	Pharmaceuticals
Mahindra & Mahindra Ltd	Automobile
Marico Ltd	FMCG
Maruti Suzuki India Ltd	Automobile
Motherrson Sumi Systems Ltd	Automobile
Nestle India Ltd	Food-products
NMDC Ltd	Mining
Page Industries Ltd	Apparel
Procter & Gamble Hygiene & Health Care Ltd	FMCG
Reliance Industries Ltd	Oil and Gas
Shree Cement Ltd	Cement
Sun Pharmaceutical Industries Ltd	Pharmaceuticals
Tata Chemicals	Chemical
Tata Global Beverages Ltd	Non-alcoholic beverages
Tata Motors Ltd	Automobile
Tata Steel Ltd	Metallurgical
Ultra-Tech Cement Ltd	Cement
UPL Ltd	Chemical
Vedanta Ltd	Metallurgical
Zydus Wellness Ltd	Pharmaceuticals