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

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Abstract

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


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 being 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 between ESG practices and the economic health of the organization. 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, Kenzhekanuly, & 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; Jassim & Paramasivam, 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, & Hameem, 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) is 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 that 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. 33). 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 Millington (2008), and Barcos, Barroso, Surroca, and Tribó (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 firms’ 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 & Gronhaug, 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 activities and SRSCM activities, 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 anecdotaly suggests that ESG practices do result in economic pay-offs (Orlitzky et al., 2003; Falck & Heblich, 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’Imma, 2018; Fuzi, Habidin, Jamadin, & Ong, 2019), green information systems (GIS) and environmental responsibility practices (Green Jr., Zelbst, Meacham, & Bhadouria, 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 (Hoejmove & 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 been forced to upgrade their approach towards managing their operations and supply chains (Lai, Wong, & Lam, 2015; Garza-Reyes, 2015; Cherrafi, Elfezazi, Chiarini, Mokhils, & 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 (Paramanirhan, Babu, Iskanisu, & 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 (Mubadi, 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 & Dhawadkar, 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 (Babiak & 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>
<thead>
<tr>
<th>Table 1. Research hypotheses</th>
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<tbody>
<tr>
<td>H1</td>
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<tr>
<td>H2</td>
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<tr>
<td>H3</td>
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<tr>
<td>H4a</td>
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<tr>
<td>H4b</td>
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</table>

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) (Fuzzi 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.

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 examine 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](image)

Notes: Fit indices of the measurement model: CMIN/DF = 1.138; RMSEA = .054; GFI = .935; AGFI = .834; CFI = .996; RMSEA = 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; PNFI = 0.506; PGFI = 0.367 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>
<thead>
<tr>
<th>Model fit indices (SEM)</th>
<th>Index</th>
<th>Score</th>
<th>Recommended value</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute fit measures</td>
<td>CMIN/DF</td>
<td>1.138</td>
<td>1.0 to 5.0 is an acceptable fit</td>
<td>Hair, Black, Babin, &amp; Anderson (2010)</td>
</tr>
<tr>
<td></td>
<td>RMSEA</td>
<td>0.054</td>
<td>RMSEA &lt; 0.08 acceptable fit and &lt; 0.06 is good fit</td>
<td>Hair et al. (2010); Awang (2012)</td>
</tr>
<tr>
<td></td>
<td>GFI</td>
<td>0.935</td>
<td>NFI &gt; 0.9 means satisfactory fit</td>
<td>Hair et al. (2010); Awang (2012)</td>
</tr>
<tr>
<td></td>
<td>NFI</td>
<td>0.967</td>
<td>NFI &gt; 0.9 means satisfactory fit</td>
<td>Hair et al. (2010); Awang (2012)</td>
</tr>
<tr>
<td>Parsimonious fit measures</td>
<td>PNFI</td>
<td>0.506</td>
<td>Acceptable, over 0.50</td>
<td>Hair et al. (2010)</td>
</tr>
<tr>
<td></td>
<td>CFI</td>
<td>0.996</td>
<td>CFI &gt; 0.95 means satisfactory fit</td>
<td>Hair et al. (2010); Awang (2012)</td>
</tr>
</tbody>
</table>

Table 2. Model fit indices (SEM)

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

Environmental practices and corporate economic performance
- EDS → ER (β = -0.34); EDS → GDS (β = 0.71); GDS → ER (β = 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 (β = -0.06); SDS → GDS (β = 0.55); GDS → ER (β = -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 intermediate 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>
<thead>
<tr>
<th>Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Environmental performance is associated with the firm's financial performance.</td>
<td>Supported</td>
</tr>
<tr>
<td>H2: Social performance is associated with the firm's financial performance.</td>
<td>Supported</td>
</tr>
<tr>
<td>H3: Corporate governance is associated with the firm's financial performance.</td>
<td>Supported</td>
</tr>
<tr>
<td>H4a: Corporate governance mediates the relationship between green practices and the firm's financial performance.</td>
<td>Supported</td>
</tr>
<tr>
<td>H4b: Corporate governance mediates the relationship between social practices and the firm's financial performance.</td>
<td>Supported</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Measure</th>
<th>What does it measure</th>
<th>Result of the study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target endogenous variable</td>
<td>Coefficient of determination ($R^2$)</td>
<td>$R^2$ (economic performance) = 0.15</td>
</tr>
<tr>
<td>Hypotheses testing</td>
<td>Structural equation modelling (SEM)</td>
<td>$F$-values for all the hypothesized direct paths are $&lt; 0.05$ and hence statistically significant</td>
</tr>
</tbody>
</table>

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 Treadafilova (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 ESG strategies 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


### Table A.1. List of companies’ part of this study

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<th>Company</th>
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