

The Mediating Role of Operational and Environmental Performance in the Relationship between Green Supply Chain Management and Financial Performance

Chairit Thongrawd¹, Pipat Pichetsiraprapa², Narintorn Somthong³, Kittiampol Sudprasert⁴

^{1,4}College of Logistics and Supply Chain, Suansunandha Rajabhat University, Bangkok, Thailand

¹chairit.th@ssru.ac.th

⁴Kittiampol.su@ssru.ac.th

²Faculty of Management Science, Rajabhat Rajanagarindra University, Chachoengsao, Thailand

²pichetsiraprapa_nui@hotmail.com

³Faculty of Business Administration, Ramkhamhaeng University, Bangkok, Thailand

³narinsom@hotmail.com

Abstract- The study is carried out with an objective to explore the impact of green supply chain management on different performance measures such as environmental performance, operational performance and financial performance. In addition to that, the mediating role of operational performance and the environmental performance in the relationship between green supply chain management and the financial performance is also examined. The study has broached a new perspective, that is external and internal GSCM practices are essential in the SC strategies, as these practices facilitate firms in enhancing market share and profits only when jointly implemented, by improving ecological efficiency and minimizing environmental risks. Therefore, the objective of this paper is to examine the interrelationships between GSCM approaches, performance, and environmental drivers. SEM-PLS is used to achieve the research objective of the current study. The study which is on Indonesian is in author knowledge is among few pioneering studies exploring the interaction of green supply chain management as determinant of firm performance measures. This study will be helpful for policymakers and researchers in examining the link between supply chain management on different performance measures such as environmental performance, operational performance and financial performance for Indonesian settings.

Keywords: Green Supply Chain, Operational, Financial, Environmental, Indonesia

1. Introduction

Green supply chain management (GSCM) consists of inter & intra-organizational, downstream and upstream SC management, using external and internal GSCM practices which aims to lessen the overall environmental effects arising from reverse and forward flux [1-4]. Although, the empirical findings indicate that improved organizational performance does not necessarily comes from the

GSCM practices [1, 5, 6]. The prior researches have reported mixed, confusing, and inconsistent findings on the relation among organizational performance and GSCM [1, 7, 8]. An insignificant positive influence by GSCM practices was found on the financial performance of a firm [9] using a meta-analysis, however, such positive effects GSCM are smaller as compared to these effects on the market-based and operational performance. Ref. [4] stated that it indicates the reason why several SC managers stay doubtful about the economic benefits obtained from the GSCM practices.

Ref. [2] suggested that “does it pay to be green” needs to be reconsidered. The market-based and operational performance might cause indirect GSCM outcomes. A few authors proclaimed that environmental management brings market share and profitability through achieving efficiency. While other authors declared that a firms’ financial performance enhances by implementing environmentally friendly activities. The empirical findings [10, 11] suggest that external and internal green supply chain management practices have the ability to indirectly influence the financial or economic performance through cost, operational and ecological efficiencies. Although, it is questionable whether such effects of mediation are applicable to all external and internal GSCM practices.

The literature does not include the ways through which GSCM can be estimated and this might influence these mediating effects. In a study [12] it is found that identifying and measuring the effects caused by GSCM is still an issue. However, [12] reported negative effects of few internal GSCM practices on the economic performance of an organization, and also found positive influence of a few external practices of GSCM. Similar findings are also found by [10]. Therefore, these crucial and contradicting evidences raise another question:

Since positive and negative impacts of both external and internal GSCM practices is possible to determine, are there any interactive effects which arise if they are jointly implemented like an internal strategy? It can be answered with the help of a new perspective, that is external and internal GSCM practices are essential in the SC strategies, as these practices facilitate firms in enhancing market share and profits only when jointly implemented, by improving ecological efficiency and minimizing environmental risks [4, 13].

Therefore, in order to analyze the impact of GSCM, a GSCM construct is required which unites every external and internal GSCM practices instead of individually examining the external and internal practices [14]. Based on this view, this research attempts to address these research questions:

- 1) Does financial performance is directly improved through GSCM and its components?
- 2) Does the relation among financial performance and GSCM can be mediated by operational and environmental performance?

2. Theoretical Framework

2.1. Green Supply Chain Management (GSCM)

Since the last decade, considerable interest has been gained by the sustainable supply chain management by the corporate sector and among the academicians [15]. Sustainable SCM is defined as management of SC for the purpose of examining the environmental, social, and economic criteria that all the members of supply chain are required to fulfill [12, 15, 16]. This is in line with the concepts of triple bottom line and sustainability, providing firms the measures to determine business sustainability, with respect to social, environmental, and economic dimensions. Therefore, sustainable supply chains must revolve around these three dimensions throughout the SC [17]. Although, simultaneously considering environmental, social, and economic dimensions seem to be difficult. Regardless of the complex nature of sustainability with respect to SC perspective, the researchers and managers are required not only to achieve true sustainability, rather employ the TBL approach for measuring the organizational progress for true sustainability [17]. Being a sustainable subset of SCM, the GSCM analyzes the external and the internal environmental activities in an organization, focusing upon the firms' cooperation with the suppliers as well as the customers and across the supply chain functions [4, 18]. Implementing appropriate management practices within the SC [19] and the joint efforts of consumers and suppliers, improve the environmental sustainability

[10, 20]. Activities of the SC partners play an integral part in the adoption of GSCM, through joint efforts and collaborative supply chains, for instance, green purchasing on the supply side among the customers, suppliers, and the manufacturers as well as functional cooperation, for gaining maximum long-term benefits. Eventually, firms start receiving environmental management benefits when the SC performs in a well-integrated manner, having cross-company and cross-functional processes to achieve sustainability [21]. Hence, the green supply chain management should be applied within and across organizations' departmental boundaries, moreover, communication and cooperation helps in achieving environmental practices [4, 22]. Various supply chain researchers operate the concept of GSCM by classifying it as the external and internal environmental management. The environmental management concept facilitates in simplifying the recognizable external and internal effects of environmental management, although the external and internal practices of environmental management are somehow closely associated. For this purpose, a single GSCM construct is needed to develop, since GSCM plays an integral part in the environmental management initiative of a firm and all the GSCM activities must be complementing one another. Literature shows that being an integral constituent of the internal environmental management, the environmental management systems supplement joint efforts for developing cooperation among the external partners of SC [23]. However, environmental information has the ability to be used and perceived in various ways, therefore, it is necessary to jointly implement the practices of GSCM. Furthermore, supply chain uncertainty arising from environmental management issues may decrease by developing the sense of trust throughout the SC [24].

Hypothesis 1. GSCM is positively related with the environmental performance

2.2. Operational & environmental performance and the GSCM practices

Performance improvement acts as the driving force to implement GSCM practices by the firms [4, 22]. Therefore, it is presumed that adopting environmental management practices bring improvement in the performance of an organization. The relation among performance and GSCM practices has been gaining enough attention in corporate practice and academic theory. Therefore, it is suggested that successful settlement of environmental issues leads to new ways of value adding to key processes and increased competitiveness. Various researches have attempted to explore how the performance is

influenced by the GSCM [10, 21, 25, 26], although mixed, confusing and inconsistent empirical findings have been reported regarding the relation among performance improvement and GSCM [27]. However, the GSCM practices have been increasingly known to be comprehensive systematic mechanisms for superior operational & environmental performance achievement [11, 18, 25, 26]. The GSCM minimizes environmental destruction, since customers, suppliers, and functional collaboration facilitates in identifying and dealing with the environmental problems [28]. Waste, and emissions coming from transportation and production processes, and the used products can be reduced through joint efforts and by implementing eco-packaging and eco-design. [18] were the first ones to examine and found positive relation among environmental performance and a few GSCM aspects. A sustainable packaging implementation poses positive influence on the environmental performance [26]. In addition, GSCM implementation results in better environmental performance, particularly because of environmental collaboration and connection with the customers. Thus, we hypothesize as follows:

Hypothesis 2. Environmental performance is positively related with the GSCM.

It has been argued in the previous researches that operational performance of a firm with respect to flexibility, delivery, and quality can be improved with the GSCM practices [26, 29]. The practices of GSCM acts to be an opportunity for analyzing production processes and product design. Proactive environmental management motivates to implement pollution-prevention strategies rather than pollution-control technologies. Since the strategies of pollution-prevention have found to be powerful and efficient as they utilize less raw materials and energy, resulting in long term reduction of operating costs. In addition, these technologies cause no harm in the form of pollution, thus no spending will be needed for pollution control (Rajiani & Pyplacz, 2018). Therefore, adopting pollution-prevention technologies signify lesser need for managing waste and quality issues, which consequently results in enhanced organizational ability to react towards the changing market conditions [30].

Some empirical studies indicated the existence of positive association among operational performance and few GSCM aspects. A study explored that green logistics management adoption can positively influence the operational performance of the manufacturer [25]. In another study, it is identified that supplier collaboration in case of environmental issues is related with three manufacturing performance dimensions, such as delivery, flexibility, and quality [29]. Moreover, environmental collaboration with the consumers is

also found to be positively related with the firms' quality improvement. Adoption of environmental purchasing as a GSCM practice improves the operational performance [26]. Although, this paper takes GSCM as a comprehensive phenomenon. However, the theoretical argument that how GSCM influence operational performance is still under studied (Ochkovskaya, 2018). Therefore, it needs to be tested as follows:

Hypothesis 3. Operational performance is positively related with the GSCM.

2.3. Financial, operational and environmental performance

Based on prior researches, this paper employ measures i.e. growth in market share, profit, and sales for indicating financial performance of an organization. A study [10] shows that the financial performance improvement occurs as a result of making investment in marketing environmental benefits and operational resource efficiency. The present study refers environmental performance as reduction in the environmental pollutants, i.e. water, air, and solid waste reduction, reduction in environmental accidents, and decline in the hazardous or toxic material consumption [11]. Furthermore, ref. [10] suggested that improved environmental performance offer firms the legitimacy to operate and ensure profit margins by initiating industry standards. In case, when competitors could not match the successful competitors' standards, it tends to produce and deliver environmental friendly products to its customers, for receiving increased market share.

The resource and cost efficiency helps in achieving better financial performance. However, it is argued that it can also be achieved through pollution-prevention technology adoption, which consequently results in zero waste, indicating that no spending is required for pollution control, and high waste disposal cost indicating less spending to deal with environmental liability and spillage. also less spending is done on waste treatments or raw materials and energy consumption owing to the hazardous material usage [31]. Therefore, with the better prospects of achieving market share and profit margins through environmental performance, following hypothesis is proposed:

Hypothesis 4. A positive association exists among financial performance and environmental performance.

Better operational performance indicates the organizational ability to fulfill customer demand with quick and timely delivery of products and services, with the right quantity and quality, waste reduction during manufacturing processes, and operational flexibility [32, 33] Operational excellence brings reduction in costs while meeting

the ever-changing needs of the customers, in order to develop environment friendly services and products, resulting in enhanced financial performance of an organization [10]. Delivery, reliability, and flexibility considered to be the determinants for measuring customer satisfaction, which brings financial gains and customer loyalty in the long-run.

Hypothesis 5. A positive association exists among financial performance and operational performance.

2.4. The role of operational and environmental performance as mediators

Prior researches provided empirical evidence on the relation among financial performance and operational and environmental performance [10, 34]. A study [34] explored the relation between a firms' financial performance and the operational & environmental performance in Japan's manufacturing industry, by employing the data envelopment analysis. The study reported that large Japanese manufacturing organizations possess the capital and technology, which improves their operational and environmental performance, resulting in improvement of their financial graph. Furthermore, [10] while examining the GSCM effects on firm's performance, found positive influence posed by the operational performance on the financial performance. In addition, environmental performance is found to be significantly associated with the financial performance of a firm.

The above mentioned studies were conducted in different economies and under varied contexts. Different measures were adopted to estimate the financial, environmental and operational performance, but these studies failed to confirm the role of operational and environmental performance as the performance mediators. Therefore, we proclaim that the GSCM practices are implemented to ensure resource and cost efficiencies as well as to minimize environmental damages, instead of just yielding market share and profits. Putting differently, it is the improved operational and environmental performance, which brings profitability, cost reduction, and new revenue. GSCM practices cause indirect influence on the financial performance of organization, through developing enhanced environmental and operational performance. Thus, we hypothesize as follows:

Hypothesis 6. Operational performance fully mediates the relationship between GSCM effects and the financial performance.

With regard to proposed hypotheses, operational and environmental performance are expected to act as mediators in the relation among financial performance and GSCM practices. Together with

the role of mediators, a significant mechanism exist among the consequent or financial performance variable and the antecedent or GSCM variable. The conceptual framework of this study indicates that in case of the absence of GSCM-performance path, the operational and environmental performance would act as mediators in this relationship.

Hypothesis 7. Environmental performance fully mediates the relationship between GSCM effects and the financial performance.

3. Methodology

The current study has used the survey-based methodology. A total of 375 questionnaires were distributed to the manufacturing organization organizations. The mail and telephonic survey is also adopted [13, 35-37]. The response rate is 54.3 percent To analyze the data, the structural equation modeling estimates have been used. SEM includes multiple regression and factor analysis. However, the distinction between the multiple regression is that the earlier access the relationship between the latent variable simultaneously, whereas later in intervals [30]. Besides, a confirmatory method of data analysis is more preferred than using exploratory factor analysis; testing hypotheses is also easier. Using SEM therefore to analyses data invariably allows the researcher the use of multiple measures to denote or represent constructs and takes care of specific error which makes it easier to substantiate the validity of the constructs under study. Being that this study measures multiple underlying variables as predictors, indirect paths and path analysis. Additionally, with the design of questionnaire which comprised of interval and ratio scales and also measures of constructs which are highly hypothetical and conceptual in nature such as this study, the choice of SEM becomes inevitable. There are various types of statistical techniques that can be employed for the purpose of research analysis, such as factor analysis, descriptive analysis, correlation and regression analysis; including simple, hierarchical and multiple regressions. An analysis is generally selected on the basis of the objectives and nature of a particular study. For instance, in order to achieve desirable objectives, the present study employed descriptive statistics, factor analysis, correlation coefficients, multiple, and hierarchical regressions. Below is the brief discussion of these analyses The scale of the studies is adopted from the [11, 29, 38].

4. Results

Structural equation modeling is a latest approach, which is being used in the business research studies for multivariate analysis. The approach enables the research to examine the casual indirect association among the variables. The variables are

simultaneously determined. Multiple regression equations are also used in the analysis. SEM and multiple regressions differ because of the fact that the association among the variables is determined independently in multiple regressions, while SEM measures simultaneously.[39]. The extent to which the estimation of structural model is supported by the sample data is done through SEM data analysis.

The co-variance structure among the observed variable is examined specifically through SEM. Inferences about the latent variables is defined through observed variables. More constructs are required to explain the latent variables. Maximum likelihood method is extensively used for the evaluation of data analysis. Extended analysis is done through SEM [40-42].

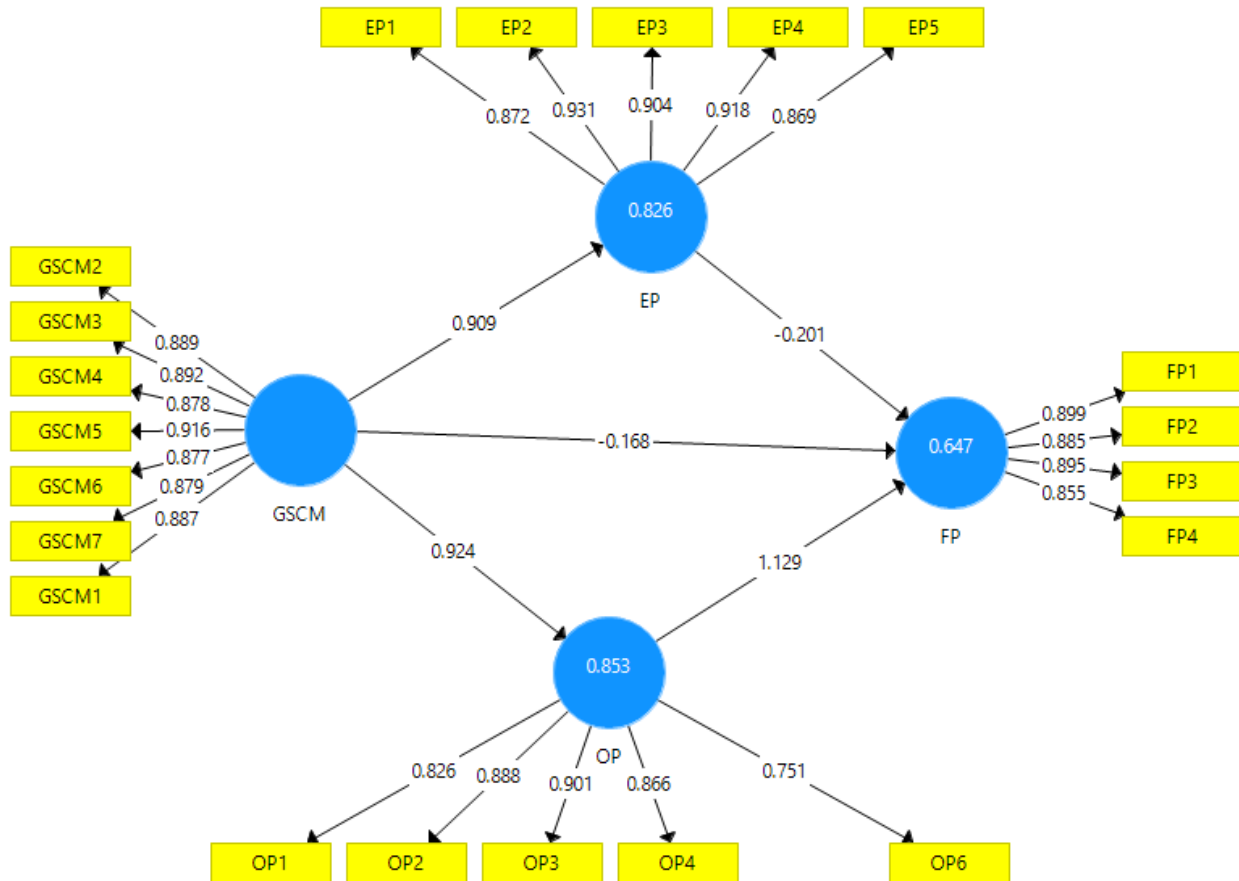


Figure 1. Measurement Model

The outer model i.e. the measurement model is assessed with PLS-SEM. This is done before the testing of research hypothesis. The method proposed by [43] and was followed by this research study. The extent to which the group of variables converges in the measurement of a specific aspect is referred as the convergent validity. According to [44, 45] there are three criteria, which can be concurrently tested in the establishment of the convergent validity. These include the Composite Reliability (CR) and Factor Loadings as well as Average Variance Extracted (AVE). In this research, the loading of all the items was assessed and the value above 0.5 suggests the acceptance level as per the studies on multivariate analysis. The loading of factors has been represented through table, which shows the significance at 0.01 level of significance. Composite reliability can be used to test convergent validity. This refers to the extent with which the

items reflect the latent construct [44, 45] in the measurement model assessment, when determining the internal consistency reliability, the individual item's reliability content validity, discriminant validity and convergent validity are required as shown in the measurement mode. Ref. [46] further recommended the use of the few best indicators, for instance one or two indicators are often deemed sufficient. For a model with latent variables to be best estimated, there should be at least two measured indicators in each latent. This is because the degrees of freedom are increased when estimating such a complex model.

Table 1. Outer Loading

	EP	FP	GSCM	OP
EP1	0.872			
EP2	0.931			
EP3	0.904			
EP4	0.918			
EP5	0.869			
FP1		0.899		
FP2		0.885		
FP3		0.895		
FP4		0.855		
GSCM2			0.889	
GSCM3			0.892	
GSCM4			0.878	
GSCM5			0.916	
GSCM6			0.877	
GSCM7			0.879	
OP1				0.826
OP2				0.888
OP3				0.901
OP4				0.866
OP6				0.751
GSCM1			0.887	

The study has examined the values of Composite Reliability and Cronbach Alpha in the Table. 2The range of Cronbach Alpha lies among 0.0.90-0.964. The range of composite reliability lies between 0.769- 0.971, which is higher than the suggested level of 0.7. The convergent validity of the outer model is confirmed through these results. For confirming the convergent validity of the outer model, the value of Average Variance Extracted

was found. It has been indicated by AVE that the average of variance extracted among a group of items related to the shared variance with measurement errors. The variance that is reflected by the indicators in relation to the measurement errors is measured by AVE. The range of average values lie among 0.510-0.919, which reflects the level of construct validity to be good.

Table 2. Reliability Analysis

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted [1]
EP	0.941	0.942	0.955	0.808
FP	0.906	0.907	0.935	0.781
GSCM	0.955	0.956	0.963	0.789
OP	0.901	0.902	0.927	0.720

To check the construct validity of the outer model, the discriminant validity is established [47]. The hypothesis testing is one through path analysis and for this, it is compulsory to test the discriminant validity[48]. The extent to which the constructs differ from each other is measured through this. It has been shown through the discriminant validity that about 111 items have used different constructs,

which do not relate to each other. Moreover, the variance among each construct is shared through the discriminant validity. The variance should be greater than the variance shared by the constructs. The method of [49] was used for determining the discriminant validity of measures. The elements in the diagonal of the table higher than other elements in the column confirm the discriminant validity of

the outer model. It is believed that the testing of the construct validity of the outer model has resulted in valid and reliable results. The hypothesized relation among the variables has been examined after the confirmation of outer model's goodness. Using

Smart PLS, the PLS Algorithm was undertaken and the hypothesis model was evaluated. The diagonal elements of the correlation matrix replaced the square root of AVE for the constructs, as shown in the table.

Table 3. Discriminant Analysis

	EP	FP	GSCM	OP
EP	0.922			
FP	0.658	0.884		
GSCM	0.909	0.692	0.888	
OP	0.897	0.793	0.724	0.848

In the next step, the structural equation model has been estimated with the use of path diagram. The direct as well as indirect association among the variables is determined through structural equation modeling. This research study has preferred structural equation modeling for testing of hypotheses [44, 45, 50]. Structural model, according to [47], illustrates about the reliance and dependence of relationships in the hypothesized model. In partial least squares (PLS), structural model takes before the directional relationships between the variables, their t-values and the path

co-efficient. Regarding path coefficient, partial least squares (PLS) is entirely like the standardized beta (Std. Beta) coefficient in regression analysis [51]. The study spotlights the evaluation model and then the assessment of the hypothesis of regression and correlation of variables. In the hypotheses structuring perspective, PLSSEM supports Parsimonious models those offer "as few parameters as possible for a given quality of model estimation results". The environmental performance appeared in insignificant relationship with the financial performance (Tabor, 2018).

Table 4. Direct Relation

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
EP -> FP	-0.201	-0.197	0.125	1.609	0.108
GSCM -> EP	0.909	0.909	0.016	57.411	0.000
GSCM -> FP	0.692	0.693	0.068	10.187	0.000
GSCM -> OP	0.924	0.924	0.013	68.705	0.000
OP -> FP	1.129	1.130	0.155	7.262	0.000

The mediating role of environmental performance and operational performance is shown in the table

5. The environmental performance does not appear as a mediator

Table 5. Mediation

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
GSCM -> EP -> FP	-0.183	-0.179	0.114	1.599	0.110
GSCM -> OP -> FP	1.042	1.044	0.147	7.114	0.000

The predictor variables explain the R2 value of the endogenous variables in the study of multivariate data analysis. The magnitude of R2 value for the endogenous variables has been considered as an indicator of the predictive power of the mode. Moreover, the technique developed by ref. [44], which was implemented to check the predictive validity of the model. PLS is a very reliable approach for reuse technique of the sample. According to [44, 50, 52] PLS has been used in this

research as well being a fit software. Table 6 presents the R-squared values of the endogenous latent variable

Table 6. R-Square

	R Square
EP	0.826
FP	0.647
OP	0.853

5. Conclusion

This paper is an extension of the previous study, aiming to clarify the GSCM effects on the three main outcomes of performance. By combining the external and internal GSCM practices in a single construct as well as analyzing the effects and relationships of every component, the present study provides a new empirical research, exploring the operational and environmental performance as mediators, using a new perspective. Explaining if the effect of fundamental GSCM practices versus single GSCM construct is indirect or direct on the financial performance, with the help of operational or environmental performance, as it might bring some advancements in the theoretical literature. It does not just facilitate in clarifying whether the ambiguous and inconsistent previous research findings might get affected with ways through which GSCM is estimated, rather it provides detailed managerial guidelines for achieving superior performance by the firm, through implementing appropriate GSCM activities. The study is of the view that the activities of the SC partners play an integral part in the adoption of GSCM, through joint efforts and collaborative supply chains, for instance, green purchasing on the supply side among the customers, suppliers, and the manufacturers as well as functional cooperation, for gaining maximum long term benefits. Eventually, firms start receiving environmental management benefits when the SC performs in a well-integrated manner, having cross-company and cross-functional processes to achieve sustainability. The present research discovered the GSCM to be a unidimensional construct that covers cross-functional collaboration to improve environmental collaboration among the suppliers and customers. The study broached an argument that the performance measures such as operational performance and environmental performance mediates the relationship between GSCM and financial performance. Thus, the GSCM, operational performance, and environmental performance appeared as antecedents of financial performance.

Being a sustainable subset of SCM, the GSCM analyzes the external and the internal environmental activities in an organization, focusing upon the firms' cooperation with the suppliers as well as the customers and across the supply chain functions. Implementing appropriate

management practices within the SC and the joint efforts of consumers and suppliers, improve the environmental sustainability. Activities of the SC partners play an integral part in the adoption of GSCM, through joint efforts and collaborative supply chains, for instance, green purchasing on the supply side among the customers, suppliers, and the manufacturers as well as functional cooperation, for gaining maximum long-term benefits. Eventually, firms start receiving environmental management benefits when the SC performs in a well-integrated manner, having cross-company and cross-functional processes to achieve sustainability. Hence, the green supply chain management should be applied within and across organizations' departmental boundaries, moreover, communication and cooperation help in achieving environmental practices. Various supply chain researchers operate the concept of GSCM by classifying it as the external and internal environmental management. The environmental management concept facilitates in simplifying the recognizable external and internal effects of environmental management, although the external and internal practices of environmental management are somehow closely associated. For this purpose, a single GSCM construct is needed to develop, since GSCM plays an integral part in the environmental management initiative of a firm and all the GSCM activities must be complementing one another. Literature shows that being an integral constituent of the internal environmental management, the environmental management systems supplement joint efforts for developing cooperation among the external partners of SC. However, environmental information has the ability to be used and perceived in various ways, therefore, it is necessary to jointly implement the practices of GSCM. Furthermore, supply chain uncertainty arising from environmental management issues may decrease by developing the sense of trust throughout the SC.

Supply chain sustainability can be regarded as a connection of different risks. According to this concept, the strategic objective of a corporation is based on identifying the risks to be embedded in the management structure and for transferring to the external environment. This must be done in a way to increase the value for customers. The management of corporations will work on allocating resources for mitigating the impact of risks. By developing suitable contracts with the suppliers, incentives can be re-allocated in the

supply chain. Moreover, credible assurances can be provided by the corporations in which suitable actions are taken in case of any risk. The credibility of supply chain sustainability has increased in the area of politics and organizational marketing strategies. However, the involvement of sustainable supply chain has not been incorporated in the processes of decision making.

The effects of sustainability related supply chain risks can damage the reputation of business organizations. The management of the organizations should work on eliminating the potential cost of these effects along with the formulation of strategies for creating value and preserving as well as exchanging it. Organizations have different considerations related to sustainability. The potential sustainability of a company is identified through the band-aid method of keeping the policy undisturbed, for instance, the prevention of waste material, recycling and initiatives to decrease the waste. A method of lifecycle development has been implemented by several corporations for establishing sustainable policies through investments. Deep-change strategies are also implemented by companies through reconsiderations of prototypes of business operations, which are driven through sustainability. The current differentiated among the traditionalists, environmentalists and leaders of sustainability in their recent research, which are different methods of corporate sustainability. The classification is based on the issues of ecology and has limited link with the social factors. Therefore, it does not resolve the implications of supply chain. Moreover, the strategic problems have emerged in most of the studies on sustainable supply chain management. According to the findings, the methods of sustainable supply chain management have been linked with ecology and the pressure of market, information and resources of an organization.

Two complementary and distinct strategies form sustainable supply chain management. These two are supply chain management for sustainable products and supplier management for performance and risk. Organizations are very concerned about their reputation in the current business era. Due to high sustainability snags, the organizational image can be damaged. There is need for additional social and environmental strategies and standards to portray organizational concern towards the environment and society. The criterion of life cycle determines the second strategy at the level of supply chain for product performance related to society and ecology. The economic capital need to be reconsidered by the management of companies in SSCM through organization of resources, which are tangible such as expansion of extension of supply chain mechanism through investments and culture of organization for sustainability. There are extensive and complicated issues in corporate

sustainability. According to [21], a suitable structure for academic research has been portrayed by identifying the difficulty of different approaches of corporate sustainability. The researchers highlighted the crucial role of organizational focus and its scope particularly different levels of organizational interaction with actors of supply chain on the way towards sustainability. There is need for practical research for the development of theory during the initial level of literature by the practitioners.

References

- [1] R. Chavez, W. Yu, M. Feng, and F. Wiengarten, "The effect of customer-centric green supply chain management on operational performance and customer satisfaction," *Business Strategy and the Environment*, vol. 25, pp. 205-220, 2016.
- [2] Brown, E. D., & Ozar, V. Effect of Poultry Production on Agricultural Production in Nigeria. *Economy*, vol. 5, pp.8-16., 2018.
- [3] J. H. Thun and A. Müller, "An empirical analysis of green supply chain management in the German automotive industry," *Business strategy and the environment*, vol. 19, pp. 119-132, 2010.
- [4] Q. Zhu, J. Sarkis, J. J. Cordeiro, and K.-H. Lai, "Firm-level correlates of emergent green supply chain management practices in the Chinese context," *Omega*, vol. 36, pp. 577-591, 2008.
- [5] J. de Burgos-Jiménez, D. Vázquez-Brust, J. A. Plaza-Úbeda, and J. Dijkshoorn, "Environmental protection and financial performance: an empirical analysis in Wales," *International Journal of Operations & Production Management*, vol. 33, pp. 981-1018, 2013.
- [6] T. K. Eltayeb, S. Zailani, and T. Ramayah, "Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes," *Resources, conservation and recycling*, vol. 55, pp. 495-506, 2011.
- [7] R. Geng, S. A. Mansouri, and E. Aktas, "The relationship between green supply chain management and performance: A meta-analysis of empirical evidences in Asian emerging economies," *International Journal of Production Economics*, vol. 183, pp. 245-258, 2017.
- [8] C. W. Wong, C. Y. Wong, and S. Boon-itt, "How does sustainable development of supply chains make firms lean, green and profitable? A resource orchestration perspective," *Business Strategy and the Environment*, vol. 27, pp. 375-388, 2018.
- [9] S. L. Golicic and C. D. Smith, "A meta-analysis of environmentally sustainable supply chain management practices and firm performance,"

- Journal of supply chain management*, vol. 49, pp. 78-95, 2013.
- [10] K. W. Green Jr, P. J. Zelbst, J. Meacham, and V. S. Bhadauria, "Green supply chain management practices: impact on performance," *Supply Chain Management: An International Journal*, vol. 17, pp. 290-305, 2012.
- [11] Q. Zhu, Y. Geng, T. Fujita, and S. Hashimoto, "Green supply chain management in leading manufacturers: Case studies in Japanese large companies," *Management Research Review*, vol. 33, pp. 380-392, 2010.
- [12] S. Seuring and M. Müller, "From a literature review to a conceptual framework for sustainable supply chain management," *Journal of cleaner production*, vol. 16, pp. 1699-1710, 2008.
- [13] Cavico, F. J., Mujtaba, B. G., Muffler, S., Samuel, M., & Polito, N. M. Manufacturer, Supermarket, and Grocer Liability for Contaminated Food and Beverages due to Negligence, Warranty, and Liability Laws. *Economy*, vol. 5, pp. 17-39., 2018.
- [14] Q. Zhu, J. Sarkis, and K.-h. Lai, "Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices," *Journal of Purchasing and Supply Management*, vol. 19, pp. 106-117, 2013.
- [15] D. Wittstruck and F. Teuteberg, "Understanding the success factors of sustainable supply chain management: empirical evidence from the electrics and electronics industry," *Corporate Social Responsibility and Environmental Management*, vol. 19, pp. 141-158, 2012.
- [16] C.-C. Hsu, K.-C. Tan, and S. H. Mohamad Zailani, "Strategic orientations, sustainable supply chain initiatives, and reverse logistics: Empirical evidence from an emerging market," *International Journal of Operations & Production Management*, vol. 36, pp. 86-110, 2016.
- [17] M. Pagell and Z. Wu, "Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars," *Journal of supply chain management*, vol. 45, pp. 37-56, 2009.
- [18] CHE, G. N., & Sundjo, F. Determinants of Female Labour Force Participation in Cameroon. *International Journal of Applied Economics, Finance and Accounting*, vol. 3, pp. 88-103., 2018.
- [19] S. Vachon and R. D. Klassen, "Green project partnership in the supply chain: the case of the package printing industry," *Journal of Cleaner production*, vol. 14, pp. 661-671, 2006.
- [20] C. WY Wong, K. H. Lai, K. C. Shang, and C. S. Lu, "Uncovering the value of green advertising for environmental management practices," *Business Strategy and the Environment*, vol. 23, pp. 117-130, 2014.
- [21] P. Rao and D. Holt, "Do green supply chains lead to competitiveness and economic performance?," *International journal of operations & production management*, vol. 25, pp. 898-916, 2005.
- [22] Q. Zhu, Y. Geng, and K.-h. Lai, "Circular economy practices among Chinese manufacturers varying in environmental-oriented supply chain cooperation and the performance implications," *Journal of Environmental Management*, vol. 91, pp. 1324-1331, 2010.
- [23] N. Darnall, G. J. Jolley, and R. Handfield, "Environmental management systems and green supply chain management: complements for sustainability?," *Business Strategy and the Environment*, vol. 17, pp. 30-45, 2008.
- [24] M. P. Sharfman, T. M. Shaft, and R. P. Anex Jr, "The road to cooperative supply-chain environmental management: trust and uncertainty among pro-active firms," *Business Strategy and the Environment*, vol. 18, pp. 1-13, 2009.
- [25] K.-h. Lai and C. W. Wong, "Green logistics management and performance: Some empirical evidence from Chinese manufacturing exporters," *Omega*, vol. 40, pp. 267-282, 2012.
- [26] S. Zailani, K. Jeyaraman, G. Vengadasan, and R. Premkumar, "Sustainable supply chain management (SSCM) in Malaysia: A survey," *International Journal of Production Economics*, vol. 140, pp. 330-340, 2012.
- [27] Chang, P. The Importance Performance Analysis of Taiwan tourism mobile marketing. *Journal of Tourism Management Research*, vol. 4, pp. 12-16., 2017.
- [28] C. Y. Wong, C. W. Wong, and S. Boon-Itt, "Integrating environmental management into supply chains: a systematic literature review and theoretical framework," *International Journal of Physical Distribution & Logistics Management*, vol. 45, pp. 43-68, 2015.
- [29] S. Vachon and R. D. Klassen, "Environmental management and manufacturing performance: The role of collaboration in the supply chain," *International journal of production economics*, vol. 111, pp. 299-315, 2008.
- [30] M. Basheer, M. Siam, A. Awn, and S. Hassan, "Exploring the role of TQM and supply chain practices for firm supply performance in the presence of information technology capabilities and supply chain technology adoption: A case of textile firms in Pakistan," *Uncertain Supply Chain Management*, vol. 7, pp. 275-288, 2019.
- [31] M. H. Hafeez, M. F. Basheer, M. Rafique, and S. H. Siddiqui, "Exploring the Links between TQM Practices, Business Innovativeness and Firm Performance: An Emerging Market Perspective," *Pakistan Journal of Social Sciences (PJSS)*, vol. 38, pp. 485-500, 2018.
- [32] B. B. Flynn, B. Huo, and X. Zhao, "The impact of supply chain integration on performance: a contingency and configuration approach," *Journal of operations management*, vol. 28, pp. 58-71, 2010.

- [33] C. Y. Wong, S. Boon-Itt, and C. W. Wong, "The contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance," *Journal of Operations management*, vol. 29, pp. 604-615, 2011.
- [34] T. Sueyoshi, M. Goto, and T. Ueno, "Performance analysis of US coal-fired power plants by measuring three DEA efficiencies," *Energy Policy*, vol. 38, pp. 1675-1688, 2010.
- [35] D. A. Dillman, "Procedures for conducting government-sponsored establishment surveys: Comparisons of the total design method (TDM), a traditional cost-compensation model, and tailored design," in *Proceedings of American Statistical Association, Second International Conference on Establishment Surveys*, 2000, pp. 343-352.
- [36] M. S. Silva, W. Smith, and G. Bammer, "Telephone reminders are a cost effective way to improve responses in postal health surveys," *Journal of Epidemiology & Community Health*, vol. 56, pp. 115-118, 2002.
- [37] S. B. Traina, C. H. MacLean, G. S. Park, and K. L. Kahn, "Telephone reminder calls increased response rates to mailed study consent forms," *Journal of clinical epidemiology*, vol. 58, pp. 743-746, 2005.
- [38] M. Feng, W. Yu, X. Wang, C. Y. Wong, M. Xu, and Z. Xiao, "Green supply chain management and financial performance: The mediating roles of operational and environmental performance," *Business Strategy and the Environment*, vol. 27, pp. 811-824, 2018.
- [39] Brahim, Z., & Nourredine, F. Corporate governance among small and medium size enterprises in Algeria: "impediments to the practice of corporate governance system". *Asian Journal of Economic Modelling*, vol. 5, pp. 154-166., 2017.
- [40] CHougule, M.P Empowering Youth through Youth Engagement in Social Action in India. *International Journal of Innovation, Creativity and Change*, vol.4, pp. 16-28., 2018.
- [41] W. W. Chin, "The partial least squares approach to structural equation modeling," *Modern methods for business research*, vol. 295, pp. 295-336, 1998.
- [42] S. Petter, D. W. Straub, and A. Rai, "Specifying formative constructs in information systems research," *MIS Quarterly*, vol. 31, pp. 657-679, 2007.
- [43] J. Henseler and M. Sarstedt, "Goodness-of-fit indices for partial least squares path modeling," *Computational Statistics*, vol. 28, pp. 565-580, 2013.
- [44] J. F. Hair, C. M. Ringle, and M. Sarstedt, "PLS-SEM: Indeed a silver bullet," *Journal of Marketing theory and Practice*, vol. 19, pp. 139-152, 2011.
- [45] J. Hair Jr, M. Sarstedt, L. Hopkins, and V. G. Kuppelwieser, "Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research," *European Business Review*, vol. 26, pp. 106-121, 2014.
- [46] L. A. Hayduk and L. Littvay, "Should researchers use single indicators, best indicators, or multiple indicators in structural equation models?," *BMC medical research methodology*, vol. 12, p. 159, 2012.
- [47] J. F. Hair, W. C. Black, B. J. Babin, R. E. Anderson, and R. L. Tatham, *Multivariate data analysis (6th Edition)*. New Jersey: Pearson Prentice Hall, 2006.
- [48] P. A. O. Duarte and M. L. B. Raposo, "A PLS model to study brand preference: An application to the mobile phone market," in *Handbook of partial least squares*, ed: Springer, 2010, pp. 449-485.
- [49] C. Fornell and D. F. Larcker, "Structural equation models with unobservable variables and measurement error: Algebra and statistics," *Journal of Marketing Research* vol. 18 pp. 382-388, 1981.
- [50] J. F. Hair, M. Sarstedt, T. M. Pieper, and C. M. Ringle, "The use of partial least squares structural equation modeling in strategic management research: a review of past practices and recommendations for future applications," *Long range planning*, vol. 45, pp. 320-340, 2012.
- [51] R. Agarwal and E. Karahanna, "Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage," *MIS quarterly*, pp. 665-694, 2000.
- [52] J. Henseler, C. M. Ringle, and R. R. Sinkovics, "The use of partial least squares path modeling in international marketing," in *New challenges to international marketing*, ed: Emerald Group Publishing Limited, 2009, pp. 277-319.