

**ENVIRONMENTAL PRESSURE, GREEN LOGISTICS STRATEGY, AND
SUSTAINABILITY PERFORMANCE: THE MODERATING ROLES OF
OWNERSHIP ORIGIN, TOP MANAGEMENT ENVIRONMENTAL
ORIENTATION, AND COMPETITIVE INTENSITY**

KNUST

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(BA PUBLISHING STUDIES)**

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NOVEMBER, 2023.

DECLARATION

I hereby declare that this submission is my work towards the MPHIL and that, to the best of my knowledge, it contains no material previously published by another person nor material that has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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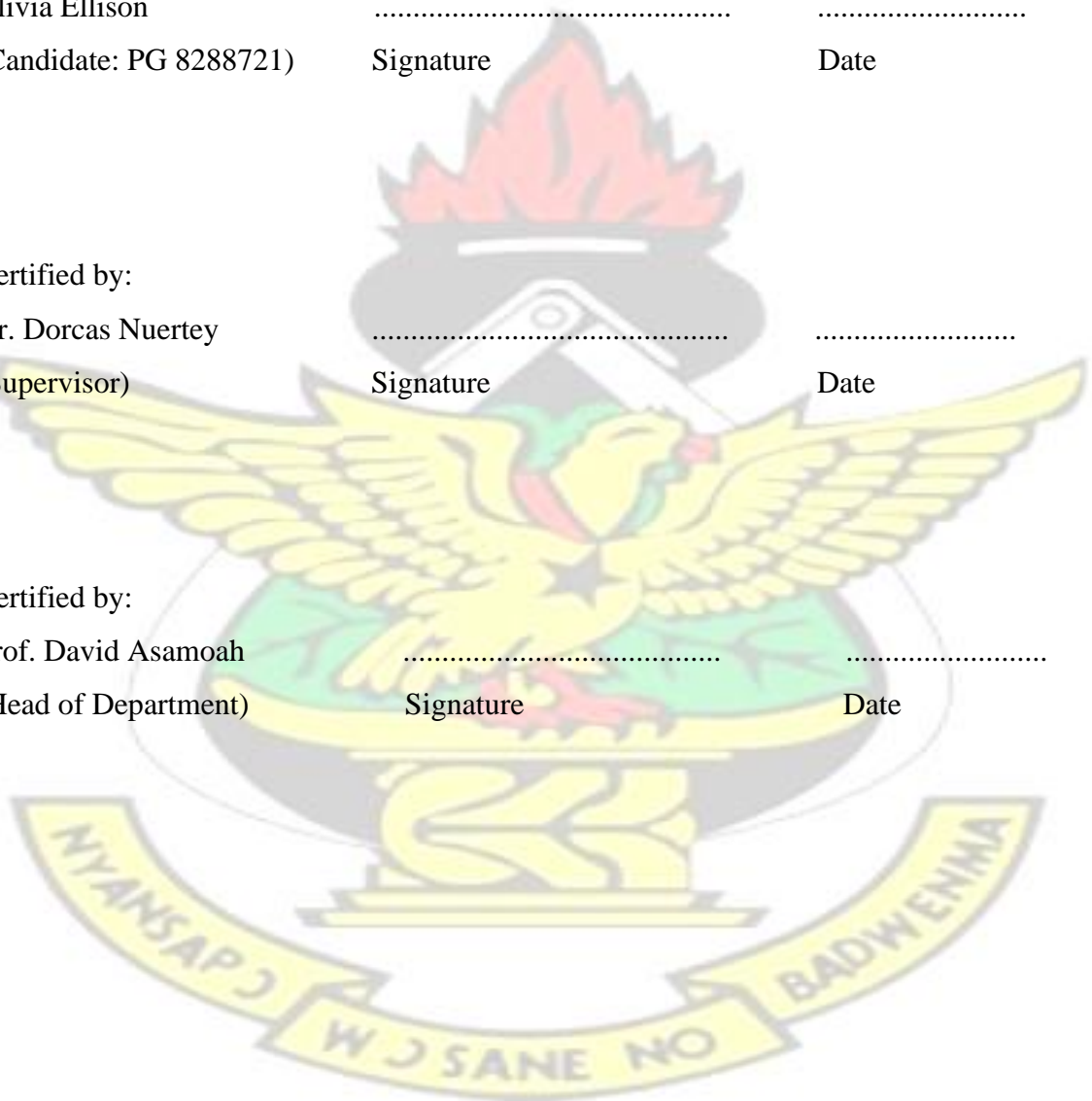
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DEDICATION

This work is dedicated to Jesus Christ, the giver of life.

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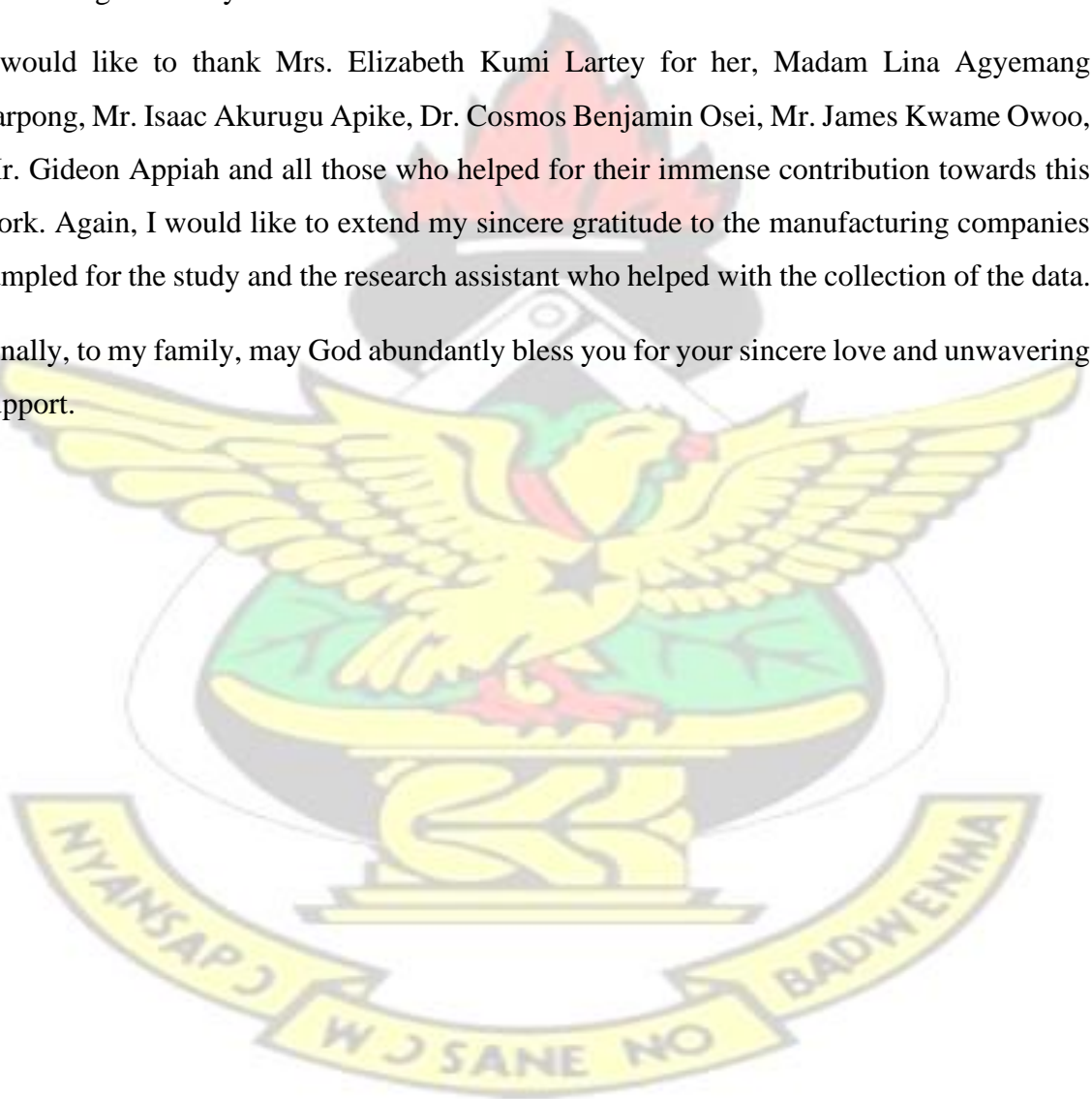


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ABSTRACT

Due to the significant environmental danger that business operations cause as a result of traffic congestion, carbon monoxide emissions, disposable packaging materials, the use of scrapped harmful materials, and numerous pollutants, it has become more necessary than ever to adopt sustainability strategies. Hence, as a consequence, businesses everywhere are under pressure to change their operations to be more sustainable while balancing social, economic, and environmental issues. Therefore, the aim of this study was to find out how market and non-market environmental pressure affects the use of green logistics strategies and sustainability performance on all fronts: economic, environmental, and social in Ghanaian manufacturing firms. Additionally, find out how the relationship is influenced by the moderating roles of competitive intensity, top management's environmental orientation, and ownership origin. To wit, the study employed a quantitative research method and used purposive and convenience sampling techniques to draw out a sample for the study. Questionnaires were sent to the sampled manufacturing firms. The 220 valid returned questionnaires were analyzed using SPSS and Smart PLS software. The results from the data analyses revealed that both market and non-market environmental pressure influences the adoption of green logistics strategy. The study also found out that, GLS positively influence the sustainability performance. The study also revealed that competitive intensity, firm ownership origin, and top management environmental orientation had no significant moderating role on the relationship between environmental pressure and green logistics strategy. This study also adds to the body of knowledge by revealing that, green logistics strategy negatively mediates the relationship between environmental pressure and sustainability performance. Finally, further studies can use firm ownership origin, top management environmental orientation and competitive intensity as moderators or mediators between green logistics strategy and sustainability performance.

TABLE OF CONTENTS

DECLARATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT.....	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background of the study	1
1.2 Problem Statement.....	4
1.3 Research Objectives	5
1.4 Research Questions.....	6
1.5 Justification of Study	6
1.6 Research Methodology	7
1.8 Limitations of the Study	8
1.9 Organization of the Study	8
CHAPTER TWO	9
LITERATURE REVIEW.....	9
2.0 Introduction	9
2.1 Conceptual Review	9
2.1.1 Environmental Pressure	9
2.1.1.1 Market Environmental Pressure	9
2.1.1.2 Non – Market Environmental Pressure	10
2.1.2 Green Logistics Strategy (GLS).....	10
2.1.3 Sustainability Performance (SP)	13
2.1.3.0 Dimensions of Sustainability Performance	14
2.1.3.1 Social Sustainability Performance	14
2.1.3.2 Environmental Sustainability Performance.....	16
2.1.3.3 Economic Sustainability Performance	17
2.1.4 Top Management Environmental Orientation (TMEO)	17
2.1.5 Ownership Origin.....	18
2.1.6 Competitive Intensity (CI)	19
2.2 Theoretical Review	20
2.2.1 Stakeholder Theory	20

2.2.2 Institutional Theory.....	21
2.2.3 Upper Echelon Theory	22
2.3 Empirical Review	24
2.4 Conceptual Framework.....	49
2.4.1 Theoretical Background.....	49
2.4.2.0 Hypothesis Development	53
2.4.2.1 Environmental Pressure (market and non-market) and Green Logistics Strategies (GLS).....	53
2.4.2.2 Green Logistics Strategy and Sustainability Performance.....	54
2.4.2.3 Environmental Pressure and Sustainability Performance	57
2.4.2.4 The Moderating Roles of Top Management Environmental Orientation, Ownership Origin, And Competitive Intensity.	58
2.4.2.5 The mediating role of green logistics strategy on the relationship between environmental pressure and sustainability performance.....	62
2.4.2.6 Control variables	62
CHAPTER THREE.....	64
RESEARCH METHODOLOGY AND PROFILE OF THE STUDY.....	64
3.0 Introduction	64
3.1 Research Philosophy.....	64
3.2 Research Design	66
3.3 Research Method	66
3.4 Study Population.....	67
3.5 Unit of Analysis.....	67
3.6 Sample Size and Sampling Techniques.....	68
3.7 Data Collection Method.....	69
3.8 Data Analysis Method	71
3.9 Tests for Validity and Reliability	72
3.10 Ethical Considerations.....	72
3.11 Profile of Manufacturing Firms in Ghana	73
CHAPTER FOUR.....	74
DATA PRESENTATION, ANALYSIS, AND DISCUSSION OF RESULTS..	74
4.0 Introduction	74
4.1 Response Rate and Response Bias	74
4.2 Data Editing.....	75

4.3 Coding and Data Entry	75
4.4 Demographic Characteristics of Respondents and Company Profile.....	75
4.5 Descriptive Analysis of Study Variables.....	78
4.6 Inferential Analysis.....	82
4.6.1 Preliminary Inferential Analysis	82
4.6.1.1 Test for Normality	82
4.6.1.2 Common Method Bias Variance	85
4.6.2 Multicollinearity Test.....	86
4.6.3 Exploratory Factor Analysis (EFA)	87
4.6.3.1 Bartlett's Test of Sphericity and KMO Test.....	89
4.7 Evaluation of Partial Least Squares-SEM Results	90
4.7.1 Assessment of Measurement Model	91
4.7.1.1 Convergent Validity	91
4.7.1.2 Discriminant Validity	93
4.7.1.3 Summary of the Measurement Model	96
4.8 Structural Model Analysis and Hypotheses Testing.....	97
4.8.1 Structural Model Evaluation and Predictive Relevance	97
4.8.2 Coefficients of Determination (R^2) and Adjusted R^2	97
4.8.3 Effect Size f^2 , Predictive Relevance (Q^2).....	97
4.8.4 Resampling Method	99
4.8.5 Hypothesis Testing.....	99
4.9 Discussion of Findings	102
4.9.1 Environmental pressure (market and non-market) on green logistics strategy.....	103
4.9.2 The relationship between green logistics strategy and sustainability performance.	103
4.9.3 Environmental pressure on sustainability performance.....	104
4.9.4 The moderating role of competitive intensity, ownership origin, and top management environmental orientation on the relationship between environmental pressure and GLS.....	105
4.9.5 The mediating role of GLS in the relationship between environmental pressure and sustainability performance.....	106

CHAPTER FIVE	107
SUMMARY, CONCLUSION, IMPLICATIONS, AND RECOMMENDATION	107
5.0 Introduction	107
5.1 Summary of Findings	107
5.1.1 The effect of environmental pressure on GLS.	107
5.1.3 The effect of environmental pressure (market and non-market) on sustainability performance.	108
5.1.4 The moderating role of competitive intensity, ownership origin, and top management environmental orientation on the relationship between environmental pressure and green logistics strategy.	108
5.1.5 The mediating role of green logistics strategy on the relationship between environmental pressure and sustainability performance.	108
5.2 Conclusion	109
5.3 Implications	110
5.3. 1 Managerial Implication	110
5.3.2 Policy Implication	110
5.3.3 Theoretical Implications	111
5.4 Recommendations for Further Research	113
REFERENCES.....	114
APPENDIX.....	137

LIST OF TABLES

Table 2.1 Summary of various definitions of green logistics strategy (GLS)	12
Table 2.2 Summary of the Empirical Review.....	47
Table 3.1 Summary of Measurement Items.....	70
Table 4.1 Demographic characteristics of firms and respondents	76
Table 4.2 Descriptive statistics	79
Table 4.3 Normality result of items.....	83
Table 4.4 Variance Inflation Factor (VIF).....	86
Table 4.5 Exploratory Factor Analysis	88
Table 4.6 Bartlett's Test of Sphericity and KMO Test	89
Table 4.7 Factor Loadings	91
Table 4.8 Composite Reliability	92
Table 4.9 Discriminant validity (Fornell-Larcker criterion).....	93
Table 4.10 Cross Loadings	94
Table 4.11 Heterotrait-Monotrait (HTMT).....	96
Table 4.12 Coefficients of Determination (R^2) and Adjusted R^2	97
Table 4.13 Effect Size f^2	98
Table 4.14 Predictive Relevance (Q^2).....	98
Table 4.15 Hypothesis Table	100

LIST OF FIGURES

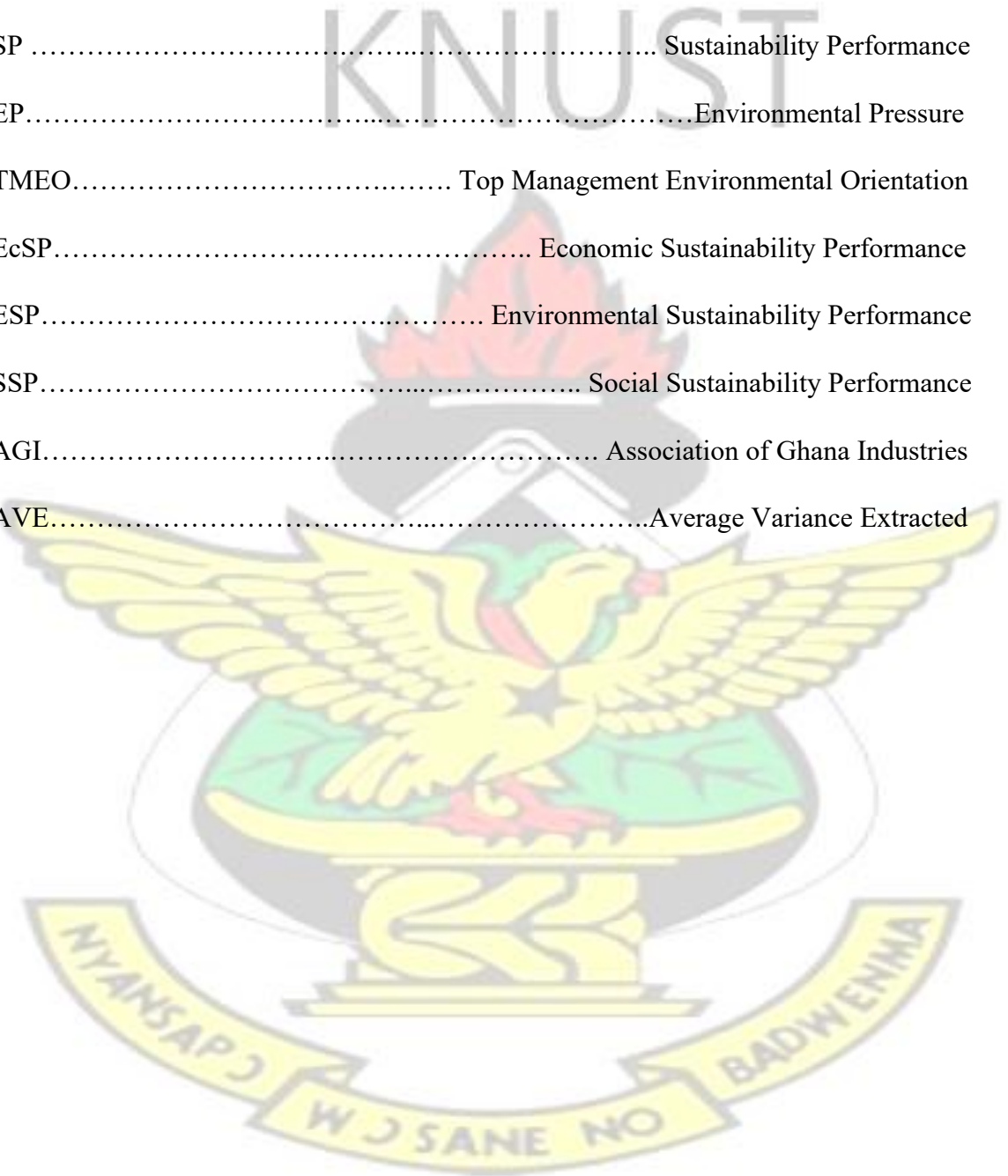
Figure 2.1 Conceptual Framework	52
Figure 4.1 Structural Equation Modelling Result	101

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ABBREVIATIONS

GLS.....	Green Logistics Strategy
GSCM	Green Supply Chain Management
CI	Competitive Intensity
SP	Sustainability Performance
EP.....	Environmental Pressure
TMEO.....	Top Management Environmental Orientation
EcSP.....	Economic Sustainability Performance
ESP.....	Environmental Sustainability Performance
SSP.....	Social Sustainability Performance
AGI.....	Association of Ghana Industries
AVE.....	Average Variance Extracted



CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Since the 19th century till now, there has been an ongoing increase in globalization and industrialization, which has made it more necessary than ever to adopt sustainable strategies (Baah *et al.*, 2021). These sustainability strategies have acquired wide acceptability in society since it was first introduced about thirty years ago (Agarwal *et al.*, 2018) and as a result, businesses all over the world are under pressure to reform their activities to be more competitive and sustainable, as well as to balance sustainable performance connected to social, economic, and environmental challenges, as a result of globalization (Shahzad *et al.*, 2020). Also due to its importance as a means of promoting sustainability, sustainable supply chain strategies such as green logistics strategy have gained recognition among supply chain scholars (Awan *et al.*, 2017).

Thus, sustainability in this study concentrates on the capacity of a firm to persist in changes in the environment or to respond to them (Rajesh, 2020). Its main objective is to meet present requirements while maintaining the ability of future generations to meet their own needs. The triple bottom line dimensions, which integrate economic, environmental, and social concerns in business, is an aspect of the growth aimed at sustainability of businesses. These three pillars of sustainability complement one another (Malik *et al.*, 2020). The environmental dimension focuses on the environment and natural resources; the economic dimension centres on the financial elements of firms and the social dimension pertains to society as a whole (Abbas, 2020). Overall, manufacturing operations have a large negative environmental impact on the society because they use a lot of energy and produce unwanted solid, liquid, and gaseous waste (Abdul-Rashid *et al.*, 2017) and hence, the need to implement sustainability strategies such as GLS. The need to implement sustainability strategies for the future has forced developing economies to buckle under mounting pressure from diverse environmental pressure and environmental degradation (Rajesh, 2020). Setyadi (2019) added that as consumer awareness of social sustainability performance grows, management increasingly recognizes their responsibilities in carrying out ethical projects to improve social welfare.

Firms have taken a course in recent years that aims to establish healthy long-lasting relationships with their stakeholders and sustainability is one of the main pillars of this relationship. It aims to protect the social, cultural, and economic aspects of the environment in which the firm works (Shahzad *et al.*, 2020). Hence, businesses are consistently urged to engage in more sustainable activities (Sharabati, 2021) and stop adopting methods that harm the environment, and switch to ones that assure sustainability performance (Davenport *et al.*, 2018). In the same way, in order to comply with today's strict rules and pressures from organizations, lawmakers, consumers, and rivals, firms must now incorporate sustainability practices into their regular strategies for environmental and social performance (Aliakbari Nouri *et al.*, 2020). Due to the depletion of natural resources and rising global temperatures, businesses are now under intense social and environmental pressure to practice sustainability activities. (Albort-Morant *et al.*, 2018).

Environmental pressures in this study are pressures including those from the government, non-governmental organizations, customers, workers, competitors, and the media to businesses to practice environmentally sustainable practices or green practices (Kitsis and Chen, 2021). For this study, environmental pressure is divided in market and non-market environmental pressure. The market pressure is said to come from individuals or groups who have a direct connection to the firm's business operations. Specifically, this includes customers, suppliers, investors, and employees. They are known to typically have an impact on a firm's financial situation (Qin *et al.*, 2019). Furthermore, in their study, Shubham *et al.* (2018) described market environmental pressure as any environmental pressure that comes from a stakeholder whose economic position is strongly attached to a firm's performance. Conversely, the non-market the non-market pressure typically does not directly influence a company's operations or financial health but concentrates on regulatory authority over a firm (Qin *et al.*, 2019). Non-market pressure includes pressure from the government, media, associations, and regulatory bodies among others. Particularly, non-market environmental pressure comes from agencies that implement laws and regulations that reduce the impact of adverse effects brought on society by industrial contamination (Kawai *et al.*, 2018). Due to the increase in awareness, suppliers have been prompted to enhance their sustainability practices, which has resulted in the adoption of numerous beneficial environmental initiatives. One of the many initiatives which cover all aspects of the operations of the products and services from the procurement of raw

materials to its disposal is green logistics. The more thoroughly the green logistics strategy is adopted in a firm, the better the sustainability performance of the firm.

Globally, green logistics strategies are constantly evolving and are crucial to the development and profitability of trade firms (Yingfei *et al.*, 2022). In the supply chain, logistics plays a significant role in resource wastage and ecological degradation (Zaman and Shamsuddin, 2017). Thus, green logistics strategy is adopted to assure the ecological safety of different operations for both the entire society and a specific customer (Bozhanova *et al.*, 2022). Although some firms have worked hard to promote green practices by progressively modifying their operations and strategies to address the worldwide environmental challenge, others have sought to increase profits at the expense of the environment. (Albort-Morant *et al.*, 2018). In Ghana which is among the fastest expanding economies on the continent, as a result of urbanization and industrialization, logistics operations in manufacturing firms are considered to constitute a serious risk to human life and the environment (Agyabeng-Mensah *et al.*, 2020). Ghana struggles with environmental pollution due to emissions because it depends so heavily on vehicles for logistics operations. It is a well-known fact that the manufacturing sector has been seriously harming the environment, contributing to contamination of the water, air, soil, and noise. Hence, implementing GLS aims to minimize carbon emissions and environmental hazards (Seroka-stolka and Ociepa-kubicka, 2019)

Although earlier research has enhanced our comprehension of how stakeholder pressure affects the adoption of green which is aimed at achieving sustainability performance, there are gaps to be filled in this subject. Green logistics management techniques, according to the study of Agyabeng-mensah *et al.* (2020a) have a positive influence on both social and environmental sustainability but not financial sustainability. There are other studies (Adnan Butt *et al.*, 2021) that indicate that pressure from the environment affects the implementation of green practices and to some extent affects sustainability. The question is to what extent does environment pressure affect adopting green strategies such as GLS and sustainability performance when there is an introduction of moderators?

Hence, this study aims to examine the effect of environmental pressure on the implementation of green logistics strategy and sustainability performance. And also examine the effect of ownership origin, top management environmental orientation, and competitive intensity on the relationship.

1.2 Problem Statement

Environmental challenges that are threatening the very foundation of human existence have brought to light the importance of sustaining the environment. In the world of business, the focus of sustainability is for businesses to manage their financial risks, environmental risks, and social business risks, as well as their responsibilities and prospects (Jan *et al.*, 2019). Businesses' environmental responsiveness or proactiveness has been demonstrated in a variety of ways, but mostly through the implementation and execution of strategies designed to minimize adverse environmental effects of operations (Jan *et al.*, 2019). Ideally, the primary goal of green logistics strategies is to ensure that all activities in the manufacturing and distribution of goods and services are undertaken sustainably while paying attention to social and environmental considerations (Seroka-stolka and Ociepa-kubicka, 2019). Hence, stakeholders, today put pressure on firms to adopt green logistics strategies in the firm. Given this, to keep up with the new business trends, every company in the globe today must transform its operations to be sustainable.

Following a review of works of literature on current green logistics strategy and sustainability, it was observed that some studies concentrated on the relationship between stakeholder pressure, green logistics performance, firm performance, and competitive advantage (Trivellas *et al.*, 2020; Agyabeng-Mensah and Tang, 2021) and found that there is an existing positive relationship. However, most of the above studies did not look at the influence of environmental pressure from stakeholders and green logistics performance to lead to sustainability performance. Other studies (Baah *et al.*, 2020; Ahmed *et al.*, 2020) also focused on how green logistics is influenced by regulatory and organizational pressure without looking at other forms of pressure such as customers and suppliers. Again, other studies (Huang *et al.*, 2017; Çankaya and Sezen, 2019; Sajjad *et al.*, 2020) focused on green supply chain management as a variable and green logistics as a dimension under the green supply chain management without looking at green logistics on its own as a variable. Again, in different regions of the world, a number of studies on green logistics management strategies have been carried out. However, research on environmentally friendly supply chain procedures such as green logistics strategies, top management environmental orientation, ownership origin and sustainability performance in Africa, notably Ghana, seems not to have, according to a meta-analysis study by Tseng *et al.*, (2019), gained enough scholarly attention. Also, there are limited studies available for the use of the upper echelon theory to explain how firm owners can influence the implementation of green

strategies. Previous studies also contend that for businesses to fully profit from green-adopting supply chain strategies like GLS, they must overcome obstacles that arise during implementation (Cousins *et al.*, 2019). Some of these obstacles could be how oriented the top management is environmentally and even, the culture and values of the owner.

As a result of these gaps, it has become relevant that this study be conducted to examine the influence of environmental pressure (market and non-market) on green logistics strategy and sustainability performance. This study also purposed to find out the moderating roles of competitive intensity, top management environmental orientation, and ownership origin on the relationship between environmental pressure and GLS in achieving sustainability performance. Specifically, the study intends to examine the relationship depending on the owner's origin (developing or developed country), firm's top management environmental orientation using the upper echelon theory and how intensified the competition is in the industry using institutional theory. In addition, this study rather than concentrating on one aspect of sustainability performance, focuses on the triple bottom line of sustainability performance concurrently.

1.3 Research Objectives

This study primarily seeks to look at the effect of environmental pressure on green logistics strategy and sustainability performance in the context of manufacturing firms. In particular, the study aims to

- i. To examine the effect of environmental pressure (market and non-market) on green logistics strategy.
- ii. To find out the influence of green logistics strategy on sustainability performance.
- iii. To examine the effect of environmental pressure on sustainability performance.
- iv. To ascertain the moderating roles of competitive intensity, ownership origin, and top management environmental orientation on the relationship between environmental pressure and green logistics strategy.
- v. To find out the mediating role of green logistics strategy on the relationship between environmental pressure and sustainability performance.

1.4 Research Questions

Finding responses to the following relevant questions is crucial to achieving the study's primary objective:

- i. What is the relationship between environmental pressure (market and non-market) and green logistics strategy?
- ii. What is the relationship between green logistics strategy and sustainability performance?
- iii. What is the link between environmental pressure and sustainability performance?
- iv. What is the moderating role of ownership origin, top management's environmental orientation and competitive intensity on the relationship between environmental pressure and green logistics strategy?
- v. What is the mediating role of green logistics strategy on the relationship between environmental pressure and sustainability performance?

1.5 Justification of Study

In Ghana, the manufacturing industry provides 1.7% of the GDP to the economy, however, the environmental cost is thought to be 10% of the GDP (Bour *et al.*, 2019). Ghana's manufacturing sector currently accounts for the majority of all GHG emissions. Hence, firms in the manufacturing industry are under a lot of pressure to protect the environment. Due to this, businesses are adopting "greener" and more ecologically friendly strategies such as green logistics strategy. Thus, this study seeks to focus on how environmental pressure affects the implementation of green logistics strategy and how it affects sustainability performance. Also, the study set to examine how top management's environmental orientation, competitive intensity, and the firm's ownership origin affect the relationship between environmental pressure and GLS. By examining the moderating effect of ownership origin, the study will provide insight into how ownership origin of the manufacturing firms owners will affect how well an organization will deal with external demand to adopt ecological safety strategies. Also, top management environmental orientation can have a major influence on the organization's overall sustainability performance as well as how much green logistical strategies are adopted. Hence, by moderating top management environmental orientation, the significance of leadership in promoting sustainable performance can be better understood. In addition, by moderating competitive intensity manufacturing firms will be able to know how the degree of competition in a market affect the implementation of green practices.

Again, the emphasis on sustainability has increased as a result of globalization. Thus, even though some manufacturing firms unquestionably are doing things correctly by practicing activities that are eco-friendly like implementing green logistics strategy into the firms, it is possible that some others are adopting strategies that do not help achieve sustainability. Due to the rising globalization, firms need to be aware of every element of their operations and constantly look for methods to make them better. In addition, this study will enable firms to assess how they measure up in terms of sustainability performance and specifically green logistics strategy as compared to other firms in the manufacturing industry. Again, the study will help practitioners and researchers seek further insights into various environments. The techniques and methodologies adopted in this research may also be used by researchers in this field of study. Furthermore, this study will give policymaker the stand to come up with and enforce environmentally focused national policies which will regulate manufacturing firms' operations. This will increase the economic well-being of the nation.

1.6 Research Methodology

According to Ranganathan and Aggarwal (2018), research design is the structure for gathering and analysing data on variables listed in a specific research problem. The study employs explanatory and descriptive research design. Explanatory research was used to explain the relationship between the variables which have been suggested as hypotheses in the conceptual model. Conversely, descriptive research was used to describe the characteristics or demographics of the population used for the study and also used to examine the relationships in study. Also, questionnaires were used to gather primary data, which was primarily used to address the study's objectives whereas, secondary data was obtained from books and articles. Manufacturing firms made up the sample frame. The questionnaires acquired provide replies on a Likert-type scale between 1 and 7. A quantitative-based strategy involving the empirical analysis of quantitative primary data will be used in the study's execution to address the research questions. The study employed the use of Smart PLS to analyse the data collected. This study employed two sampling techniques which are, purposive and convenience sampling. The purposive sampling technique was used to select manufacturing firms because they engage in a lot of logistics operations that cause environmental hazards. Whereas convenience sampling was used to select 300 manufacturing firms among the existing manufacturing firms in Ghana registered with Association of Ghana Industries.

1.7 Scope of the Study

The goal of the study was to examine how environmental pressure impacts green logistics strategy and sustainability performance. Hence, geographically, the scope of this study was Ghana. Manufacturing firms from different industries were used and this is because, their activities are seen to have a negative impact on the environment, contributing to contamination of the water, air, soil, and noise. The focus of this research, however, was centred on one top management in each firm. Theoretically, this study examined how environmental pressure influences GLS and sustainability performance. This study also examined the moderating roles of competitive intensity, ownership origin, and top management environmental orientation in the relationship market and non-market pressure and GLS in Ghanaian manufacturing firms using theories such as upper echelon, stakeholder, and institutional theory.

1.8 Limitations of the Study

There are difficulties in almost every field of study, and this one was no different. The study excluded companies in the service sector and only centred on manufacturing companies in Ghana making it difficult to generalize the outcome of the study. Also, the sample size may be a drawback to this study despite the fact that it provides an acceptable representation of the population. The scope of the study presented challenges for the researcher given the time limit to complete the work.

1.9 Organization of the Study

The study is organized into five chapters. Chapter one is sectioned into nine subsections. It begins with the background of the study, followed by the problem statement, research objectives, research questions, the justification of the research, research methodology, scope of the study, the study limitations, and the organization of the study. Chapter two of the study presents relevant literature that is linked to the research topic being explored. Also, chapter two provides the theoretical background, empirical review, and conceptual framework of the study that explains the relationship between the study variables and hypothesis development. Chapter three also presents the methodology used by the researcher with valid details and the respondents who partook in the research. Chapter four gives a comprehensive data analysis of the research, results, and discussion of findings. Finally, chapter five presents a summary of the study findings, conclusions, and recommendations from the findings with regard to green logistics strategy and sustainability performance.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The review of relevant literature is the primary focus of this chapter. The chapter is divided into four major parts; Section 2.1 concentrates on the definition of key variables necessary for the study, Section 2.2 concentrates on the key theories that underpin the study of green logistics strategy, Section 2.3 includes details on the empirical literature that has been undertaken into GSCM, and Section 2.4 gives the justification for the conceptual framework and hypothesis development.

2.1 Conceptual Review

The definitions of the various constructs used in this study which include environmental pressure (market and non-market pressure) green logistics strategy, sustainability performance (environment, economic and social), competitive intensity, top management orientation, and ownership origin are all presented in this section.

2.1.1 Environmental Pressure

Environmental pressure is defined as pressures including those from the government, non-governmental organizations, customers, workers, competitors, and the media that are significant motivators for businesses to practice environmentally sustainable practices or green practices (Kitsis and Chen, 2021). As per Butt *et al.* (2021), environmental pressure is exerting influence on firms to operate more sustainably and with greater concern for the environment. Therefore, organizations are ultimately highly motivated to choose various meaningful environmental initiatives to present themselves as environmentally conscious businesses.

2.1.1.1 Market Environmental Pressure

Market pressures emerge as suppliers, customers, and industrial clients become more conscious of the environment and use their influence to push businesses to employ environmentally friendly strategies and/or refrain from polluting activities (Kawai *et al.*, 2018). Market pressure is defined to have a direct connection to business operations. These include customers, suppliers, investors, and employees. They are known to typically have an impact on a firm's financial situation (Qin *et al.*, 2019). According to Seman *et al.* (2018), any pressure that comes from a person or group with a significant influence over an organization's finances is referred to as market pressure. In other words, any

environmental pressure that comes from a stakeholder whose economic position is strongly linked to a firm's performance is referred to as market environmental pressure (Shubham *et al.*, 2018). In addition, they also explained market pressure as pressure channels from stakeholders who conduct business with the firm. Market environmental pressure is also referred to as pressure exerted by a customer on a firm to implement eco-friendly strategies (Kawai *et al.*, 2018). To Todd *et al.* (2017), it is regarded as pressure coming from stakeholders who are crucial to an organization's sustained effective performance. Market pressure is deemed to be given to firms from stakeholders who are significantly important to a company's existence and performance (Danso *et al.*, 2020).

2.1.1.2 Non – Market Environmental Pressure

Non-market pressure includes statutory requirements for businesses to address environmental concerns and enforce proactive environmental policies (Vilchez *et al.*, 2016). Also, according to Qin *et al.* (2019), non-market pressure typically doesn't directly influence a company's operations or financial health but focuses on regulatory authority over a firm. Again, by establishing legal regulations, policies, and practices, Butt *et al.* (2021) explained that non-market pressure is attracted from governmental organizations and regulatory bodies. They also explained that it occurs when regulatory bodies compel businesses to adopt environmentally friendly practices and also believe that integrating strategies for environmental sustainability into their operations is crucial for maintaining their viability. Seman *et al.* (2018) also explained that non-market pressure includes societal stakeholders' pressure from an ecological perspective. Non-market pressure includes pressure from the government, media, associations, and regulatory bodies among others. It is also referred to as the level of regulatory stakeholder expectations or pressure on businesses to enhance their environmental performance (Zhang and Zhu, 2019). Also, non-market pressure as per Shubham *et al.* (2018) is pressure from stakeholders that do not possess any formal contractual power over the firm. They are also known as pressure from agencies that implement laws and regulations that reduce the impact of adverse effects brought on society by industrial contamination (Kawai *et al.*, 2018).

2.1.2 Green Logistics Strategy (GLS)

Green logistics is one of the critical sub-components of the green supply chain management process, which has been increasingly competitive over the past decade. This is because of globalization, market competitiveness, buyer preferences, and market diversification (Zaman and Shamsuddin, 2017). It encompasses multiple efforts to quantify and control

the environmental impact of a firm's manufacturing activities (Chhabra *et al.*, 2017). Meanwhile, a strategy is defined as the long-term path and scope of a firm to satisfy its market requirements and meet stakeholder expectations (Soewarno *et al.*, 2019). Therefore, the term "green logistics strategy" refers to a collection of supply chain management strategies and initiatives that concentrate on handling materials, waste disposal, packaging, and transportation to reduce the environmental and carbon footprints of products delivery (Seroka-stolka and Ociepa-kubicka, 2019). Seroka-stolka and Ociepa-kubicka (2019) continued by saying, in terms of sustainability, GLS is seen as the manufacturing and delivery of goods in a sustainable way while considering social and ecological factors. Also, GLS has broadened to include a variety of green initiatives aimed at reducing overall ecological consequences and providing ecological sustainability (Jinru *et al.*, 2022).

To add up, Zhang *et al.* (2020) also described GLS as an enhancement of traditional logistics that stresses the implementation of logistics strategies in an environmentally friendly manner to attain logistical and economic development while conserving resources and safeguarding the environment. Also, the primary goal of GLS is to minimize the ecological consequences of logistics activities, such as Greenhouse gases emission, noise, and waste, and to achieve balanced growth among the economy, society, and the environment (Wang *et al.*, 2018). On the other side, GLS is described by Zhang *et al.* (2020) as an environmentally friendly logistics system that comprises greening logistical processes like transportation, warehouse management, and distribution, together with green recycling of reverse logistics like waste disposal and recycling. Again, An *et al.* (2021) added that GLS emphasizes waste reduction and natural resource conservation, which is strongly linked to environmental sustainability and firm economic growth. In the same manner, GLS is said to entail incorporating efficient and environmentally friendly strategies and guidelines into firms' logistics practices in order to minimize waste and help preserve energy and resources, thereby minimizing the impact of their logistics activities on the natural environment and human lives while advancing firm performance, (Agyabeng-Mensah and Tang, 2021). GLS encompasses forward and reverse logistics activities, such as sustainable transportation, sustainable information dissemination, sustainable distribution and packaging waste disposal, and green monitoring and assessment (Baah *et al.*, 2020); reduce ecological pollution; reduce wastage; and preserve energy to meet stakeholders' environmental demands and establish competitive advantage.

In the same vein, Karia (2019) indicates specifically that, GLS is concerned with the entire green physical distribution (inbound and outbound logistics) for handling the flow of green materials or green products/services from the point of origin to the point of consumption, which includes greening in transportation, storing and inventory, order fulfilment, materials handling, and packaging. Thus, according to Karaman *et al.* (2020), GLS is an essential component of firms' attempts to attain sustainable performance.

Table 2.1 Summary of various definitions of green logistics strategy (GLS)

No.	Definition	Author(s)
1.	Green logistics strategy is described as a logistics strategy that optimizes energy consumption through the utilization of energy-saving automobiles, delivery process improvement through improved routing and distribution scheduling, incorporated shipping procedures to decrease the amount of transportation, and the adoption of eco-friendly transport technologies.	Atmayudha <i>et al.</i> (2021)
2.	Green logistics strategy refers to the planning, regulating, and implementation of a logistics system that employs the use of advanced logistics innovations as well as prevents environmental pollution.	Richnák and Gubová (2021)
3.	A green logistics strategy is a strategy that significantly decreases ecological harm and operational expenses while also improving energy conservation and the competitive flow of products and services.	Li <i>et al.</i> (2021)
4.	A green logistics strategy is a low-cost strategy that is frequently required for economic growth and international trade.	Yingfei <i>et al.</i> (2022)
5	The concept of green logistics strategies encompasses all processes linked to environmentally efficient management of the movement of goods (push and pull) and information with the goal of adding value to customers and fulfilling their needs.	Seroka-stolka and Ociepa-kubicka (2019)
6.	Green logistics strategy is described in terms of sustainability as the manufacturing and delivery of products in a sustainable way whilst also taking social and ecological factors into account.	Sibihi and Eglese (2009) as stated in Seroka-stolka and Ociepa-kubicka (2019)

7. A green logistics strategy is the planning, controlling, and integration of logistics systems using advanced logistics strategies to reduce environmental dangers. Tan *et al.* (2020)

2.1.3 Sustainability Performance (SP)

Since enhancing shareholder wealth is the firms' prime objective, performance is primarily assessed from a financial perspective with less focus on non-financial performance (Afum *et al.*, 2020). However, recently, non-financial performances like social and environmental performances have been added (Agyabeng-Mensah *et al.*, 2020). In addition to this, the issue of enhancing sustainability has also received more attention in recent times (Sidek *et al.*, 2022). Sustainability is defined as a development that meets the needs of the present generation without jeopardizing the availability of resources for future generations (Umar *et al.*, 2022). Svensson *et al.* (2018) added that it is linked to a sense of well-being that accepts transformation over the long term rather than concentrating primarily on present actions and outcomes. This implies that sustainability is seen as a long-term goal for firms and thus, it should be included in the firms' strategic plans. Hence, for a firm to succeed both now and in the future, it must accept the idea of sustainability (Zaid *et al.*, 2018). Also, Raza *et al.* (2021) stated that, for firms to achieve sustainability, firms need to meet their goals for both revenue and cost indicators as well as environmental and social dimensions. This suggests that profit creation and growth of firms are therefore linked not just to economic issues but also to social and environmental capital.

In the context of this study, sustainability performance is the extent to which a firm's strategies and procedures have a significant impact on enhancing environmental, social, and economic performances (Hussain *et al.*, 2018). Thus, this suggests that, sustainability performance is primarily a crucial aspect of firms' performance and needs to be included or integrated into firms' strategies. From the study Setyadi (2019), sustainability includes all firms' activities that promote socially responsible business practices; improve the capacity to protect and preserve the environment, as well as to befriend all living things, and enhance the community's ability to support itself. Zaid *et al.* (2018) refer to sustainability performance as the effective integrated assessment of the economic, environmental, and social performance of the firm. This implies that firms now need to make a substantial contribution to the environment and society as a whole in addition to

maximizing profit. As a result, Pham and Kim (2019) relate sustainability performance to environmental preservation, economic progress, and social well-being. Therefore, to fully evaluate the performance impact of green logistics strategy, this study uses the triple bottom line (TBL) dimensions to measure sustainability performance (Agyabeng-Mensah *et al.*, 2020).

2.1.3.0 Dimensions of Sustainability Performance

Most studies on sustainability indicate that firms adopt strategies to concurrently achieve economic, environmental, and social objectives and this is called the Triple Bottom-Line (TBL) of sustainability (Zaid *et al.*, 2018; Pham and Kim, 2019; Kamble *et al.* 2020; Barbosa *et al.*, 2022). Thus, by balancing their objectives for economic, environmental, and social performance, businesses can achieve sustainable performance. As a result, evaluating performance from a sustainable point of view enables businesses to evaluate their efforts, make improvements to environmental and social performances, and do so while also increasing value for their shareholders (Çankaya and Sezen, 2019).

2.1.3.1 Social Sustainability Performance

In addition to ensuring that businesses are profitable, social sustainability also prevents industrial activity from having a negative social impact (Abdul-Rashid *et al.*, 2017). Social sustainability measures how much a company's reputation has improved as a result of implementing sustainable practices, as well as the welfare of its employees and other stakeholders, including customers, suppliers, end users, and the community (Agyabeng-Mensah *et al.*, 2020). Abdul-Rashid *et al.* (2017) and Wang and Dai (2018) further explained that social sustainability performance is measured, among other things, by staff health and safety, improvements in the society's quality of life, career training for residents, and employee training. Moreover, Ahmadi *et al.* (2017) also said that, the social elements of sustainability can address both internal and external human resource challenges. Here, the internal human resources aspects may include employment stability, health and safety, and capacity development. In essence, SSP makes sure that firms' social missions are carried out in reality. This means that, firms need to ethically consider how their operations affect society (Barbosa *et al.*, 2022). Therefore, the idea of social sustainability is linked to how the business affects the social systems in which it operates and how it interacts with different stakeholders (Hussain *et al.*, 2018).

To Duque-Uribe *et al.* (2019), social sustainability performances involve dynamic, complicated, and subjective aspects of human nature. This implies that, human factors of sustainability are the primary focus of social sustainability. This is because, it addresses issues about the quality of life and motivates decision-makers of firms to think about any possible societal repercussions their choices can cause. Hence, in their study, Hussain *et al.* (2018) stated that, to ensure social sustainability, a wider range of human needs must be met in a way that protects nature and its capacity for long-term regeneration, while also upholding social fairness, human dignity, and social inclusion. Setyadi (2019) characterized socially sustainable performance as an evaluation of an organization's commitment to a safe workplace, social responsibility and investment, education, and human resource advancement. This implies that, SSP represents the societal interactions mediated through employment, as well as interpersonal relationships. Moreover, firms are said to be socially sustainable if they meet the basic needs of humans and are designed to avoid and preserve generative capabilities over a long period, basic rights of social fairness, human self-respect, and contribution are met (Talan *et al.*, 2020). It is defined by Younis and Sundarakani (2020) as a firm's combination of principles of social responsibility, processes of social responsiveness, and strategies, initiatives, and observable outcomes as they correspond to the firm's societal relationships.

Also, Staniškienė and Stankevičiūtė (2018) argue that social sustainability can be defined as "development sustainability" (addressing basic needs, establishing justice, and promoting equity); "bridge sustainability" (connected to behavioural changes); and "maintenance sustainability" (relating to preservation). Social sustainability performance can also be referred to as the actual consequences of sustainability practices on social aspects related to the image of a firm and its products from the perspective of many stakeholders such as suppliers, workers, consumers, and the community at large (Zaid *et al.*, 2018). Also, SSP includes the growth and fulfilment of people's needs as well as the preservation of long-term social relationships (Fernando *et al.*, 2019). Therefore, involvement in social developmental activities, public policy, monetary and non-monetary contributions to non-profit organizations, safety and wellness precautions, and employment practices is what SSP emphasizes. SSP is also a human system attribute that is founded on various ethical concepts including fairness, equity, justice, and participation (Malik *et al.*, 2020). In a nutshell, social sustainability concentrates on the internal and external aspects of a firm (Wang and Dai, 2018).

2.1.3.2 Environmental Sustainability Performance

Environmental sustainability performance entails changing our lifestyle preferences in order to increase the likelihood that the environment will continue to support human security, well-being, and health indefinitely (Goyal *et al.*, 2018). Also, environmental sustainability performance can be defined as the amalgamation of a firm's abilities to reduce the overall carbon footprints of goods (Rajesh, 2020). Afum *et al.* (2020) in their explanation further stated that, environmental sustainability performance is achieved when manufacturing firms reduce their solid and water waste, carbon pollution, use of contaminated and dangerous inputs, frequency of environmental mishaps, and overall environmental impact of their activities. Environmental sustainability performance is strongly dependent on the usage of cleaner and more efficient renewable energy sources. In this sense, it is essential to ensure that the resources utilized in production are renewable and emit as little CO₂ as possible (Abdul-Rashid *et al.*, 2017). Given this, environmental sustainability, is said to be the preservation and maintenance of the environment for current and future generations (Fernando *et al.*, 2019).

In addition, environmental sustainability performance according to Zaid *et al.* (2018) and Agyabeng-Mensah *et al.* (2020) is related to a firm's ability to reduce the consumption of toxic and hazardous substances and the frequency of environmental disasters. Goyal *et al.* (2018) also described environmental sustainability as "actions to limit the detrimental effects and increase the positive impacts of human behaviour on the environment through design, production, application, operation, and disposal of services and products during their life cycle. To Abbas (2020), EP emphasizes the promotion and protection of natural resources and the environment, waste management, cleaner production, and consumption of resources. Also, the efforts made to "increase human welfare by safeguarding the sources of raw materials utilized for human needs and ensuring that the sinks for human wastes are also not surpassed, to prevent harm to humans are referred to as environmental sustainability (Cook *et al.*, 2017).

To sum up, the entire ecosystem and resources are prioritized in ESP (Abbas and Sağsan, 2019). Specifically, ESP is concerned with reducing environmental harm and resource exploitation (Malik *et al.*, 2020). This indicates that, environmental preservation is critical for long-term economic productivity and intergenerational equity.

2.1.3.3 Economic Sustainability Performance

Economic performance is assessed by economic growth while safeguarding the environment and enhancing people's quality of life (Abdul-Rashid *et al.*, 2017). Also, economic sustainability performance concentrates on firms' economic and financial factors (Guerrero-Villegas *et al.*, 2018). To add on, Agyabeng-Mensah *et al.* (2020) specified that, economic sustainability performance is a measure of how well commercial and financial successes are accomplished and improved in the firm. This implies that, firms cannot thrive unless they generate a profit and are profitable. Rajesh (2020) in his study also defined economic sustainability performance as an organization's impacts on the economic conditions of its stakeholders and economic structures at the community, national, and global levels. He further stated that, the economic sustainability of firms is measured using four basic criteria which are; economic health, economic growth, possible financial rewards, and trade. Financial health reveals a firm's internal financial stability, whereas economic performance assesses the firm's worth as perceived by stakeholders, senior management, and the government. Possible financial rewards examine those financial rewards other than earnings and trading possibilities to determine the trade network's exposure to various types of risk.

Furthermore, the measure of the extent to which firms' marketing and economic success are attained and improved by implementing sustainability practices into their operations is also seen to be the firm's economic sustainability performance (Agyabeng-Mensah *et al.*, 2020). And also, to analyse a firm's economic sustainability performance, firms need to focus on both short-term and long-term financial stability. Again, EcSP is important to corporate financial success; in order to continue, an organization must be able to supply goods and services on a consistent basis while also generating a profit (Yong *et al.*, 2020). Notwithstanding, economic sustainability performance is also concerned primarily with cost-effectiveness, profit creation, energy efficiency, waste utilization, and etc. (Shahzad *et al.*, 2020).

2.1.4 Top Management Environmental Orientation (TMEO)

According to the researchers, top management is responsible for determining and formulating which strategies to implement, as well as extensively conveying them throughout the firm (Yusliza *et al.*, 2019). Child (1997) as stated in Cao and Chen, (2019), posits that "top management is an important player in strategic decision-making". Environmental orientation denotes the strategic move to incorporate environmental

initiatives into a firm's tactical, operational, and inventive operations as a way of achieving internal values while also responding to external market pressures (Ardito *et al.*, 2021). Also, as per Yu and Huo (2019) environmental orientation is an essential part of environmental protection that demonstrates the extent to which the firm participates in preventing environmental deterioration. In addition, environmental orientation is defined as demonstrating how stakeholders, strategic planning, goods, services, and processes change to become more bothered with environmental and sustainability issues (Aboelmaged and Hashem, 2019). It is an understanding of environmental issues and a desire to contribute to finding solutions (Trivedi *et al.*, 2018). Again, it has also been explained by Alcock *et al.* (2017) as the environmental behaviour, concern, or attitude of an individual or firm.

Hence, top management's environmental orientation is said to be a reflection of top management's emotional connection, desire, conviction, and attitude toward achieving the firm's environmental objectives (Yusliza *et al.*, 2019). In the same vein, Gilal *et al.* (2019) suggest that, top management environmental orientation is the attitude of firms' top managers toward environmental protection and their motivation towards integration of environmental concerns into their firms' strategy. Again, top management environmental orientation refers to top management behaviours, values, and characteristics that affect their decision to implement different environmental strategies in their firm under the same political and economic context (Cao and Chen, 2019).

2.1.5 Ownership Origin

The word ownership of a company according to Hansmann (1988) refers to the individuals or a group who own or jointly own the formal rights to run a company and to appropriate its residual income. Concerning this study, ownership origin refers to the home country of the firm owner (Dagnelie *et al.*, 2018). Again, for this study, the origin of firm owners will be looked at in terms of developing nations and developed nations. According to Banihashemi *et al.* (2017), developing countries are countries that lack economic growth while developed countries are countries that have grown economically.

Also, in the study of Kumar *et al.* (2022), developing countries are countries whose citizens are less concerned about the environment whereas developed countries are countries whose citizens are concerned about the environment. In terms of sustainability, they defined

developing countries as countries whose government's major concern is to develop wealth and raise citizens' standard of living rather than sustainability practices.

2.1.6 Competitive Intensity (CI)

Competitive intensity according to Taherdangkoo *et al.* (2019) is the level of competition that a firm faces, as well as the intensity of its sustainability-related moves (within a particular industry). CI can also be measured as the degree of competitiveness in a market, which can influence customers' perceptions of their market power (Feng *et al.*, 2019). In the same view, Kmiecik and Michna (2018) in their study said that, competitive intensity occurs when market competition becomes more intense and, as a result, customers are presented with increasing options. Again, Anning-Dorson and Nyamekye (2020) described competitive intensity as intense competition among firms due to the number of competing firms and opportunities for advancement. He continued by saying, CI measures the level of inter-firm competition, marketing wars, competitive strategies, and competitive offer matching within a specific market. Similarly, the effect a firm has on the survival chances of other companies is referred to as competitive intensity (Alinejad and Anvari, 2019). Thus, this implies that CI is a major component of firms' industrial and market structure. As a result, competitive intensity is a key feature of a firm's products and performance (Alinejad and Anvari, 2019). Consequently, CI demonstrates a state of competition between firms within the same industry, wherein firms' behaviour largely mirrors the actions of industry participants, introducing conditions of uncertainty and unpredictability (Adomako *et al.*, 2017).

Furthermore, Tariq *et al.* (2022) explained that, competitive intensity affects how a firm can create value from its innovative activities. Concerning market structure, competition intensity is measured by the number of firms competing in an industry and the allocation of market shares among these firms (Holm and Ax, 2020). CI is also seen as the extent to which firms impose a demand on each other within a particular market (Nabi *et al.*, 2022). Specifically, CI has been recognized by scholars as a vital source of motivation for innovation (Kmiecik and Michna, 2018). Moreover, Hou *et al.* (2019), in their study defined CI as a condition in which there are many rivals in the market, causing companies to take up valuable competitive pressures from external intense competition, which affects the development and growth performance. As one of the ecological factors, the intensity of competition creates incentives for firms to distinguish themselves from other firms (Beigi, 2021).

2.2 Theoretical Review

In examining the impact of environmental pressure on GLS and sustainability performance, this study significantly expands the use of stakeholder theory, institutional theory and upper echelons theory.

2.2.1 Stakeholder Theory

The dominant theoretical perspective for assessing sustainability and green logistics issues is stakeholder theory. The concept "stakeholder theory" refers to a group of ideas that explain the correlation between businesses and their stakeholders in addition to some of the impacts of these correlations (Jones *et al.*, 2018). Previous research indicates that companies prioritize sustainability and green logistics strategies due to growing stakeholder expectations of the firm in society (Sajjad *et al.*, 2020). A stakeholder is defined as "any person or group who can impact or is impacted by the accomplishment of the organization's objectives" (Kawai *et al.*, 2018). Based on the theory, a firm has numerous stakeholders who do have interests in and are impacted by the firm's activities (Shen *et al.*, 2018; Qin *et al.*, 2019). Employees, customers, suppliers, governments, etc. are examples of stakeholders (Schaltegger *et al.*, 2019). According to stakeholder theory, firm operations generate environmental consequences to which stakeholders may respond, sometimes by putting pressure on the firm to reduce adverse consequences (Schmidt *et al.*, 2017). In their study, Kawai *et al.* (2018) stated that, as per stakeholder theory, sustaining trust-based collaboration with different sets of stakeholders is an unavoidable component of firms' decision-making pertaining to corporate strategy, governance practices, and ecological and social management. This perspective is reinforced by the opinions of Malik *et al.* (2020), which point that, stakeholder theory acknowledges the importance of instituting relationships with stakeholders, contending that stakeholders want long-term relationships with firms in order to grow firm wealth and have sustainable wealth. Again, according to Freeman (1984), Freeman *et al.* (2010) and Donaldson and Preston (1995) as stated in Freudenreich *et al.* (2020), to stakeholder theory, a firm is defined as a set of essential relationships between people or groups who influence or are influenced by its company operations. These various stakeholders offer resources, influence the firm's environment, benefit from the firm, and have an effect on both its performance and impacts.

Numerous studies have confirmed that stakeholder pressure is a significant factor motivating firms to adopt environmentally friendly practices. For example, Zhang *et al.* (2020) proposed that consumer demand motivates firms to indulge in green activities for

green logistics. Also, the government, public, and international communities have an impact on firm sustainability practices. Malik *et al.* (2020) indicate that, firms are committed to these practices because they want to communicate to stakeholders that the firm is conscious of the environment and wants to exert control over it. Besides that, stakeholders within firms, such as managers and employees, have discovered that green innovation such as green logistics is an essential requirement for sustainability and the long-term growth of firms and as a result, they are eager to employ the strategies (Song and Yu, 2018). Consequently, one founding principle of the stakeholder theory is that "firms are performers in the social environment and should hence respond to demands and pressures from their stakeholders in order to fulfil their strategic goals" (Chang *et al.*, 2017, p. 51).

Hence, building on stakeholder theory, this study uses this theory to explain why some firms have adopted green practices such as green logistics strategy as well explain the positive effect of GLS on sustainability performance.

2.2.2 Institutional Theory

Firms, besides having production systems, are part of a social system that has its own distinct culture and values. When all firms within a particular industry implement similar formalized strategies and decision-making methods, it shows that they are attempting to institutionalize themselves. Institutional theory is employed to comprehend various types of external factors that compel any organization to institute or implement any new strategy (Saeed *et al.*, 2018). Hence, the institutional theory is founded on the premise that firm decisions are affected by external norms, value systems, and customs in addition to rational economic choices (Chu *et al.*, 2019). Also, it is concerned with how social pressures shape the acts of organizations and insists that firms introduce strategies in order to establish legitimacy or recognition in the society. Thus, according to institutional theory, firms' actions are affected not only by their firm objectives and competitive intensity but also by their institutional/social surroundings, which include both official rules and laws imposed by governments and other regulatory bodies as well as unofficial restrictions (norms of behaviour, common values, belief systems) backed by society as a whole (Kawai *et al.*, 2018). The study continues by saying, firms are required to follow these rules and restrictions to be accepted by local society; failing to do so may hinder the firm's progress.

Likewise, DiMaggio and Powell (1983) as stated in Qin *et al.* (2019), suggest that, institutional theory has three kinds of drivers that can affect a firm's green initiatives: coercive, normative, and mimetic. Qin *et al.* (2019) further explained that, administrative or regulatory officials enforce coercive pressure on firms, forcing them to adopt a specific course of action; the government is an example of one of these authorities. These pressures can appear in the form of requests or as a source of the fear of being banned/fined for failing to comply with particular government laws or regulations (Saeed *et al.*, 2018). Also, professional institutions, suppliers, customers, Non- Governmental Organizations (NGOs), and the general public exert normative pressure. Industrial associations, for example, may press firms to standardize or professionalize their operations; the media may shape firm environmental behaviours to conform to environmental norms. Normative pressures are caused by certain standards and norms that have been formally recognized by the environment as a result of societal expectations of that environment (Saeed *et al.*, 2018). Moreover, mimetic pressure is felt by a firm from other firms in their industry, such as competing companies, who influence the firm to benchmark or emulate their practices. To Saeed *et al.* (2018), when there is a substantial change in the external environment that threatens the existence of a firm, firms look for role models which they believe were successful in coping with those external difficulties and attempt to adjust their conformance with those model firms.

Per the institutional theory, there are two main mechanisms influencing organizational behaviour; imposition and inducement. These two mechanisms restrict a firm's actions through regulatory institutions and other institutions. The imposition mechanism forces firms to create required changes to prevent potential costs, uncertainty, and potential lawsuits for failing to comply. Similarly, the inducement mechanism creates incentives to influence firms to behave desirably (Li *et al.*, 2019).

Therefore, this theory explains why firms are willing to implement the green logistics strategy and how it positively affects the firms' sustainability performance. Also, it explains why competitive intensity allows a firm to adopt a green logistics strategy.

2.2.3 Upper Echelon Theory

In the upper echelon theory, top managers play an important part in the selection and adoption of strategic choices that significantly influence a firm's performance or growth according to Hambrick (2007) and Hambrick and Mason (1984) as stated in Shahab *et al.*

(2020). In their study, they further explained that, a firm's top management is an integral component of the strategic management process, and the value and qualities of top management define both financial and non-financial performance of the firm. From the viewpoint of the upper echelons, unique properties of top management, including psychological and noticeable characteristics (e.g., former experiences, career paths, educational status, origin, and age), are critical factors in strategic policy adoption (Shahab *et al.*, 2020). Also, Under the upper echelon theory, firms' strategic choices are expressions of the top management's value systems and cognitive bases (Li *et al.*, 2019). Dubey *et al.* (2018) also explained upper echelon theory as top management' experiences, values, and personalities have a significant impact on their interpretations of the problems they encounter and, as a result, their decisions. They are essential for the implementation of key objectives in a firm. Thus, top management support and dedication are important prerequisites for the implementation of some green practices (Bhatia and Jakhar, 2021).

In addition, to upper echelons theory, top management also serves as the link between the firm's external environment and its internal operations. They can also recognize external pressures and opportunities, and thus establish and influence a firm's strategy based on the firm's internal resources and capabilities (Ma *et al.*, 2021). Indeed, according to Wei *et al.* (2020), comprehending the factors that influence how top managements understand their strategic environment is vital because their understandings significantly influence their firm's practices. In particular, it offers a theoretical basis for comprehending a firm's strategic choices regarding the implementation of organizational innovation (Kanashiro and Rivera, 2019). This theory also suggests that environmental and organizational stimuli can influence a firm's top management's actions and beliefs (Wei *et al.*, 2020). This further affects firms' social strategies because they ascertain a firm's strategy for corporate sustainability performance (Iguchi *et al.*, 2022). Again, top managers are also responsible for supporting and giving adequate resources to guide firm performance (Bhatia and Jakhar, 2021). According to the upper-echelon theory, top management's values, priorities, and cognitive abilities affect how they perceive firm problems and arrive at strategic choices (Lin *et al.*, 2021). Hence, top management personality traits and conduct typically represent a significant contributor to variations in firms' profitability (Huang *et al.*, 2020). As a result, top management frequently interprets strategic situations differently using personalized lenses and is ultimately responsible for the firm strategy and success (Lin *et al.*, 2021).

Therefore, this current study builds upon the upper-echelon theory to explain how the environmental orientation of top management as well as the ownership origin of the firm can positively affect the relationship between environmental pressure and green logistics strategy.

2.3 Empirical Review

This study explores empirical research on green logistics strategy, sustainability performance environmental pressure and competitive intensity. The review concentrates on various industries in order to understand the most significant ideas and research results for this study. First of all, Baah *et al.* (2020) conducted a study investigating whether or not organizational and regulatory stakeholder pressures are friends or foes to green logistics practices and financial performance. The main task of the study was to investigate and examine the impact of organizational stakeholder pressure and regulatory stakeholder pressure on green logistics practices and financial performance, as well as to determine whether both social and environmental reputation is what is missing in influencing the relationships between organization stakeholder pressure, regulatory stakeholder pressure, green logistics practices, and financial performance. Using the Krejcie and Morgan sampling technique, two hundred samples were selected at probability sampling from a catalogue of four hundred logistics organizations derived from logistics associations in Ghana. After this, a questionnaire, along with a cover letter outlining the purpose of the study, was sent to selected firms via e-mail, with follow-up visits and phone calls. One hundred and forty questionnaires were completed out of the two hundred sent representing a 70% response rate. Given that it has greater predictive power, the structural equation partial least square modeling technique was used to analyse the data.

After the investigation, it was revealed that company and regulatory stakeholder pressures impact the initiation and implementation of green logistics practices, thereby improving the firm's environmental reputation and financial performance. The outcome of the study specifically showed that regulatory stakeholder pressures have a significant impact on a firm's social reputation, which in turn has a significant impact on financial performance. Also, the findings show that, depending on the way they are held, organizational and regulatory stakeholder pressures can be both friends and foes of green logistics practices. Although green logistics practices were also discovered to be an alternate mediating variable, it is crucial to highlight that the study had several limitations and therefore proposed that, future research should take other variables into account that can describe the

organizational stakeholder pressure, regulatory stakeholder pressure, green logistics practices, and firm performance correlations mentioned. Other studies could take into account the various components to know the individual component effects on firm performance.

Aroonsrimorakot *et al.* (2022) also carried out a study looking at the importance of green logistics for environmental sustainability for Thailand's green logistics management. The primary task of the study was to report the results of a comprehensive literature review on the subject of Green Logistics (GL), as well as its significance from different sources obtainable; printed and digital means. The study explored all related publications released at the time of undertaking the study, inputting pertinent keywords, such as "Green Logistics", "Green Logistics and Environment", "Green Logistics Strategies", and "Green Logistics Management in Thailand". And over thirty-three, green logistics-related reviewed publications were employed. At the end of the review analysis, management of transportation, storage, packaging, loading and offloading; creation of environmentally friendly warehousing; assessment of logistics operation systems, public relations activities, promotion, and training; utilization of integrated information technology to boost awareness of green logistics and reverse logistics; and partnership of organizational and stakeholder priorities were some of the strategies retrieved from the literature review for the development of green logistics in Thailand. The outcome of the article's limitation is that it is only dependent on existing literature. Therefore, to obtain a more accurate outcome, an empirical investigation, such as a case study, would be far more scientifically sound and also, the implementation of ICT and performance measurement for environmental sustainability could be explored.

Agyabeng-Mensah *et al.* (2020), particularly focus on the effect of green logistics management practices, supply chain traceability, and logistics ecocentricity on sustainability performance. The study looked into the impact of green logistics management practices, logistics ecocentricity, and supply chain traceability on sustainability performance. And this is because, in today's competitive market, the importance placed on green practices has made green logistics management practices an important driver of firm performance. The authors selected 351 manufacturing firms at probability sampling from the Registrar Department of Ghana's database of 650 manufacturing firms. The authors contacted the firms via email and phone calls to enquire about green logistics management practices, supply chain traceability, and logistics

ecocentricity on sustainability performance as well as their willingness to participate in the study. The three hundred and fifty-one (351) manufacturing firms consented to be our participants in the study, and structured questionnaires were sent out to them along with anonymity and authorization letters explaining why the data was being collected and guaranteeing them the data's anonymity. The questionnaires were due back to the respondents in 10 weeks. During the study, two hundred and seventy-four questionnaires were sent back from the managers representing a 42.15% response rate. And to assess the projected hypotheses, data were analysed using the partial least square structural equation modeling approach.

At the end of the study, Agyabeng-Mensah *et al.* (2020) concluded that green logistics management practices have a positive impact on both social and environmental sustainability. However, green logistics management practices harm business performance. Again, the result of the study revealed that logistics ecocentricity and supply chain traceability supplement green logistics management practices, resulting in significant improvements in both business performance and environmental sustainability via the mediation effect approach. Although the sample employed for the research appropriately represented the intended demographic, it could still have an impact on the conclusions because sample size can have an impact on a researcher's findings. Future studies may thus take into account employing other methods that are likely to increase respondent involvement.

Sidek *et al.* (2022) also tried to examine the cognizance in improving sustainability towards society 5.0 through green logistics. In the Malaysian context, the study tried to establish the degree of environmental performance awareness, economic performance awareness as well as firm performance awareness. Data was retrieved primarily through a convenience survey with a structured open-ended and close-ended questionnaire from 387 Malaysian respondents and were assessed employing IBM SPSS Statistics for frequency, descriptive, and correlation analysis. Information was retrieved on issues such as green logistics awareness, economic performance awareness, environmental performance awareness as well as firm performance awareness. After the study, the authors concluded that, there is a strong positive relationship between economic performance awareness, environmental performance awareness, and organizational performance awareness when it relates to increasing the sustainable development of green logistics.

Kitsis and Chen (2020) assessed whether motives matter when examining the link between motives, supply chain management practices and triple-bottom-line performance. The study intended to examine the function of motives in guiding sustainable supply chain management strategies and sustainability performance. This was done by drawing on a variety of theoretical perspectives and a combination of supply chain and business ethics literature. The authors employ structural equation modeling (SEM) analysis on a sample of two hundred and eight supply chain firms in the USA which represent a sample rate of 24.4% of the eight hundred and fifty-two respondents who were qualified to access the data instrument. The study was based on three kinds of motives as drivers of sustainable supply chain management which are; instrumental, relational, and moral. The study's findings emphasize the importance of moral motivations while also emphasizing the strength of all three types of motivations (instrumental, relational, and moral) in sustainable supply chain management strategies and in improving outcomes in all triple bottom line of sustainability performance (economic, environmental, and social). The findings of the study also indicated that, sustainable supply chain management had a significant positive impact on the triple bottom line performance, showing the enormous importance of sustainable supply chain management.

On limitations, only three measuring items made up every one of the motivation components; therefore, adding more indicators would help give a more complete picture of these significant constructs. Additionally, cross-validation of the findings using a new data collection instrument might aid in confirming the mediating effect of sustainable supply chain management considering the contradicting results of the post-hoc analysis. Also, the study found no significance in the indirect relationship between relational motives and economic performance because it can take a longer time to establish ties and work together with outside partners before their combined efforts would have a significant economic impact.

Rudyanto and Siregar (2017), undertook a study that argues that stakeholder pressure and corporate governance influence the quality of sustainability. The goal of the study was to look at how stakeholder pressure and corporate governance affect the quality of sustainability. Where the stakeholders' components used were, surroundings, workers, end users, and shareholders, whereas the board of commissioner effectiveness and family ownership constituents' corporate governance. The study employed the multiple regression method, with a total of one hundred and twenty-three sustainability reports from listed

firms on the Indonesia Stock Exchange from 2010 to 2014. The outcome of the paper indicated that firms that face environmental and consumer pressure have better quality sustainability performance than their competitors. Also, employee pressure improves the quality of the sustainability performance as compared to shareholder pressure which has no impact on the quality of the sustainability performance. Finally, the results of the study stated that the effectiveness of the board of commissioners has a positive impact on the sustainability report, whereas family ownership does not influence the quality of the sustainability report. Fewer samples were used to conduct the study since fewer companies disclosed independent sustainability reports. Additionally, the study did not look into the pressure that various stakeholders exert on the various types of information revealed in sustainability reports.

Cao and Chen (2019) measured the moderating effect of top management environmental awareness on the relationship between internal and external environment on green innovation strategy. The purpose of the study was to investigate how external environmental pressures; policy pressures and market pressures and internal environmental driving forces which are innovation resources and innovation capability can influence firms to pursue green innovation strategies, with the moderating role of top management's environmental awareness. Out of the record number of five hundred and fifty survey questionnaires distributed, three hundred and twenty-seven were returned. Which represented a response rate was 59.5%. Where, two hundred and sixteen survey responses were maintained after excluding incomplete and subject matter contradictory questionnaires, for an effective rate of 39.3% which was analysed using SPSS 20.0 software. At the end of the survey, it was concluded that both incentive policy and market pressure significantly and positively influence green innovation strategy. Also, the capability of innovation positively has a significant impact on the green innovation strategy. Meanwhile, the green innovation strategy is unaffected by innovation resources. Again, when top management is more environmentally conscious, the correlation between green innovation strategy and coercive policy as well as the relationship between green innovation strategy and market pressure becomes stronger. The study's sample source had some restrictions because; the sample source was primarily drawn from Shandong, Zhejiang, Shanxi, and other regions due to energy and resource limitations. Also, although this study is cross-sectional and static, firms at different phases of development may encounter diverse internal and external factors.

Trivellas *et al.* (2020) on the other hand presented a comprehensive analysis of how green Logistics Management can impact sustainable business and supply chain performance. The survey focused on the Greek Agri-Food Sector. Their work sought to examine the link between green supply chain management practices and three distinct performance components, namely supply chain, green (environmental) and business performance, and environmental dynamism control. The empirical study was conducted with the help of a structured self-administered questionnaire filled out by individual interviews, primarily with executive officers of companies in the agri-food supply chain. After the fill out questionnaires, the process resulted in one hundred and thirty-four questionnaire responses out of which nine questionnaires were exempted from the assessment due to having over 10% being uncompleted data. Hence, after the study, the authors concluded that the most influential factors influencing sustainability, business, and supply chain performance are the exchange of information, logistics connectivity, and transportation. Furthermore, green packaging is strongly linked to financial and social performance. The conceptual framework includes specific, predefined dimensions for green supply chain management and green logistics management. However, it was recommended that, other potential contributing factors may have been investigated, such as corporate social responsibility activities, strategy, culture, and leadership, which will have enhanced the study's findings.

Butt *et al.* (2021) also attempted to assess the role marketing and non-marketing stakeholders have on firms' greenwashing practices and consumer perception. The goal of the study was to learn how consumers perceive how external stakeholders in marketing and non-marketing affect the business implementing greenwashing practices in emerging economies. The study's theoretical model reflected the various external pressures pressuring businesses to engage in greenwashing. The study's unit of analysis is green consumers because the information was gathered from customers making green product choices. Data was gathered using a self-administered online survey and a non-probability-based sampling technique; the google online form was made available to the respondents via various social media platforms such as Facebook, various WhatsApp groups, and email addresses. Three hundred and ninety-one questionnaires were recovered from green consumers in Pakistan out of which three hundred and fifty-eight were used to conduct further analysis. The thirty-three remaining respondents were outliers who were identified and hence, deleted using the multivariate outlier technique.

At the end of the study by Butt *et al.* (2021) the study concluded that, competitive pressure has a negligible effect on an organization's decision to adopt greenwashing practices, however, regulatory pressure and consumer pressure have a significant effect. Again, consumers, as per their research, think that businesses engage in greenwashing strategies either to win over customers or to avert legal implications. Also, the study sheds light on the negative influence external stakeholders has on businesses that are involved in greenwashing and also indicated the significant implications for monitoring greenwashing practices and lowering the propensity to engage in it. According to the authors, the following are some of the study's drawbacks. First off, because data was only gathered in Karachi in Pakistan. Again, the study only considered external influences, and the conceptual framework based on earlier studies showed three external elements. Therefore, the researchers proposed that the inclusion of other external (like policy incentives) or internal (like top management orientation) elements that influence enterprises to choose greenwashing tactics is advised for future research.

Kitsis and Chen (2021) also explored how top management commitment plays a mediating role between stakeholder pressure and green supply chain practices. The goal of the study was to assess top management's commitment as mediating the correlation between stakeholder pressure and green practices and their impact on environmental and economic performance. According to the authors, eight hundred and fifty-two (852) respondents were sampled from two thousand one hundred (2100) firms in the United State of America. 852 questionnaires were sent to respondent and two hundred and six questionnaires were returned and analysed. Representing the valid response rate of 24.2% (two hundred and six out of eight hundred and fifty-two).

The study's conclusions emphasize the crucial mediating effect of top management commitment in directing stakeholder pressure toward a company's green practices and carefully analyse how top management commitment mediates the correlation between stakeholder demand and environmentally friendly practices. Additionally, it highlights the crucial role that green practices play in converting internal and external factors such as stakeholder pressure and top management commitment into higher economic and environmental performance. According to the authors, the inadequacies in the work that opened up new areas for future research was the elimination of some construct of stakeholder pressure during the questionnaire development. The eliminated stakeholder

pressure was connected to pressures from the government and non-governmental organizations.

Agarwal *et al.* (2018), presented a study that addresses how internal impetus affects the mediation model of green supply chain management adoption. It is vital to know the elements that promote GSCM adoption and as a result, the authors proposed that internal impetus, referring to an organization's internal motivation and managerial dedication towards environmental sustainability, is a crucial driver of GSCM adoption in addition to institutional factors like rules, markets, and suppliers. Therefore, the goal of the study was to look into internal impetus as a possible mediator between institutional pressure and GSCM adoption. In gathering data, one hundred and twenty-one middle and senior-level managers at U.S.A manufacturing organizations who had their business degrees from two Midwestern institutions were sent the questionnaire. They were conveniently chosen due to their technical know-how and supply chain management capabilities. Six out of the sixty-six questionnaires which were returned (with a 54.5% response rate) were identified to be duplicated or to have incomplete data. Therefore, sixty completed questionnaires were useful for the investigation.

They revealed that internal impetus fully mediates external pressures on GSCM implementation from consumers and other market forces, but external constraints from regulators have no influence on GSCM adoption for the firms used in their sample. In gathering data, all responses were gathered at once which the researchers deemed to be the limitation of their study and propose that, a longitudinal study would be necessary to capture the dynamic nature of adopting and answer questions like, "How well does the adopting progress with time?". Also, does the relationship between external and internal pressure evolve? What influences adoption's rate of growth? Lastly, the majority of our respondents hail from the Midwest, which is, in our opinion, less controlled than other regions of the nation.

Adomako and Tran (2022) assessed how stakeholder pressure mediates the correlation between environmental collaboration, responsible innovation, and firm performance. The main aim of the research was to examine the effects of environmental collaboration on business performance via the mediating role of responsible innovation. The researchers used a database published by Ghana Business Directory to randomly choose a sample of six hundred manufacturing businesses although there were seventeen thousand two

hundred companies in the database. The study concentrated on businesses in manufacturing. The findings indicate that a business's extent of environmental collaboration promotes responsible innovation using data gathered from the two hundred and twenty-five companies whose questionnaires were returned. The results of the study also show that when stakeholder pressure is more intense, environmental collaboration has a significant influence on ethical innovation and responsible innovation serves as a mediator between environmental collaboration and business performance. Moreover, because the study's conclusions are based on a sample from Ghana, they do not take into account how environmental collaboration, responsible innovation, and company performance apply in different contexts.

Çankaya and Sezen (2019) empirically evaluated the impact of green supply chain management practices on sustainability performance. The study aimed to investigate the effects of eight green supply chain management (GSCM) factors which are; environmental education, internal environmental management, green packaging, green marketing, green manufacturing, green distribution, internal environmental management, and investment recovery on the three aspects of company sustainability (economic, environmental, and social performance). The study hypothesized that; the performance of the economy is positively correlated with green purchasing. And also, green buying and social performance are positively correlated. Utilizing a plant-level survey, the associations between GSCM strategies and sustainability performance were examined. Data from a cross-sectional in-person and email questionnaire were sent to Turkish manufacturing companies were used to test a proposed study model and its underlying hypotheses. Two hundred and eighty-one responses were received. The presented hypotheses were tested using structural equation modeling. The results of the study showed that, all the above GSCM aspects used in the study aside from green purchasing have been determined to be linked to a minimum of one aspect of performance. The use of GSCM practices in manufacturing organizations was the primary goal of this research. Therefore, the framework can be changed to reflect other kinds of businesses, such as retailers and wholesalers.

Huang *et al.* (2017) investigated the drivers of green supply chain initiatives and performance. By combining institutional theory, stewardship theory, and view of performance, the authors intended to investigate how internal and external influences simultaneously influence businesses to undertake green supply chain strategies and to build

a comprehensive conceptual framework. The study indicated that, there is a growing demand for many Taiwanese businesses to create suitable procedures to address the issues brought on by unpredictable business environments. Data were gathered by mailing surveys to Taiwanese manufacturers of electronics and electrical components from the list of the largest association of electrical and electronics manufacturers in Taiwan with more than three thousand six hundred. As a sample criterion, a one-thousand-members firm with a capital of at least ten million Taiwan dollars was randomly chosen. A sample of 1000 member organizations yielded a total of Three hundred and eighty useable replies, which corresponds to an acceptable response rate of 38%. Structured equation modeling and bootstrapping were used to evaluate the collected information. The study concluded that, institutional forces have an impact on businesses' green supply chain endeavours as well as managers' environmental stewardship behaviours are also influenced by institutional pressures. Again, the green supply chain initiatives of businesses are impacted by management's environmental stewardship behaviours, and also, businesses' green supply chain activities have an impact on their rivals, economic success, and environmental performance and the results of the bootstrapping show that institutional constraints have an indirect impact on enterprises' green supply chain initiatives through managements' environmental stewardship behaviours.

The necessity for businesses to have a corporate culture has grown as a result of environmental sustainability. Hence, the study proposed that, future studies can look into the connection between institutional constraints, a greening company culture, and business green supply chain activities as well as looking into different industries and small firms. The green supply chain actions having positive effects on the environment and the economy were the exclusive focus of the study. However, future studies may focus on sustainability supply chain management, which has been shown to improve society in terms of social, environmental, and economic factors as well as performance metrics simultaneously for the environment, economy, and society to learn more about their triple bottom line impacts on sustainability.

Foo *et al.* (2019) undertook a study to analyse the relationship between green purchasing capabilities, practices, and institutional pressure. To successfully implement green purchasing practices while dealing with institutional pressure, the research aimed to identify the green purchasing capabilities needed. In particular, the study investigated how buyer businesses might engage in green purchasing under the influence of institutional

pressures on supplier development, assessment, and cooperation. The study concentrated on Malaysian manufacturing companies with ISO 14001 certification because the implementation of green initiatives was more widespread in this industry than in other industries and according to green procurement is more likely to be implemented and used in the manufacturing sector. Targeting management in the purchasing and supply chain activities, seven hundred and eight surveys were distributed through postal and email to all ISO 14001-certified businesses listed in the directories of the Standards and Industrial Research Institute of Malaysia and the Federation of Malaysian Manufacturers. A one-respondent-per-company methodology was employed in the study with a response rate of 23%, and a total of 163 valid responses were received. It included, the food and packaging relating to food industries provided the majority of responses (23.9%), electrical and electronics (22.7%) as well as rubber and plastics items (9.8 percent).

At the end of the study, it was revealed that the correlation between green manufacturing capabilities and practices is positively moderated by regulation, client, and competitive pressure. Not taking into account the viewpoints of suppliers or sub-suppliers, the researchers concentrated on the viewpoints of buying firms. Furthermore, the authors recommended that, future studies should look at the viewpoint of suppliers and offer details on the variables that influence and the difficulties associated with implementing green strategies to satisfy the demands of purchasing organizations.

Ahmed *et al.* (2020) evaluated how firm performance is affected by institutional pressures and green supply chain management practices. Concepts like environmental design, eco-friendly products, green technologies, and efficient processes have forced firms to accept change in response to the issue of environmental sustainability practices. Hence, the research aimed to clarify how institutional pressures and green supply chain (GSC) management methods affect firms' financial and environmental performance in an emerging economy. The population of the study primarily focused on all supply chain management specialists and managers' operations from ISO 14001 accredited companies in Pakistan. The responders were primarily production and supply chain managers deputy managers and managers of supply chain management. A questionnaire was employed to gather information from these professionals employed by manufacturing companies. After this structural equation modeling was employed to examine the relationship between the constructs using reliable data from one hundred and one respondents. According to the research findings, institutional pressure and internal green supply chain strategies have a

negligible but insignificant effect on economic performance; however, all of the other variables significantly improve environmental performance. The study was limited to evaluating the economic and environmental performance of Pakistani manufacturing companies. And then, further proposed that, studies in this field might focus on a specific industry sector or individual cases, such as chemical, leather, automotive, pharmaceutical, or textile, to be more specific when presenting strategic implications. Also, to track the systematic impact on each dimension, such as operations performance, marketing performance, innovation performance, etc., various measuring performance variables could be introduced. Again, to ensure the results are rigorous, more studies in the context of developing nations are needed.

Alinejad and Anvari (2019) carried out a study on the correlation between process management and organizational performance and the mediating role of collaborative structure and competitive intensity. The purpose of the study was to determine how collaborative structure and competitive intensity affected the link between organizational performance and process management in Shiraz Municipality. In terms of research purpose and type, the current study was both descriptive and practical, respectively. In addition, the Shiraz Municipality provided eighty experts, senior managers, and administrative assistants for their statistical population for the study. Sixty-seven municipal executive managers and specialists in all were chosen as the study sample utilizing the Morgan table and simple random sampling procedure, as well as a survey with a Likert scale of five points, was used. Then, Cronbach's Alpha coefficient, which had a value of 0.91 was employed to assess the validity and reliability. Statistical techniques including descriptive statistics, confirmatory factor analysis, structural models, and one-sample t-tests were used to evaluate the study hypotheses. Due to the mediating influence of competitive intensity, the findings demonstrate that process management has a favourable and substantial impact on a company's performance. Also, it was found that process management has a favourable effect on the organization because of the collaborative structure's mediating function. Only subjective measurements of firm performance and process management were used in the study. Therefore, implementing an objective standard for evaluating performance, creativity, trustworthiness, information dissemination, usability, and efficiency according to the authors is an area that still needs more research. Since an Iranian group provided the data for the study, it is possible that some western nations might not be directly relevant to the findings.

Awan *et al.* (2017) undertook a study to know the connection between stakeholder pressure and sustainability performance in manufacturing firms in Pakistan. Examining the correlation between stakeholder pressure, the implementation of sustainable supply chain strategies, and their consequence on sustainability performance was the goal of the study. Also, the study focused on the only social and environmental performance of the firms. To achieve the above, questionnaires were sent to eight hundred firms. To evaluate the developed hypotheses, a sample was selected from the Sialkot Chamber of Commerce and Industry's certified database of manufacturing exporters, and the sampling technique employed was stratified. This is because a sample of two categories of operational exporters whose company registration dates were early in 2009 was selected. Also, in order to make the results more trustworthy and generic, the exporting company selected must have at minimum 5 years of experience working with the export. Out of the eight hundred questionnaires sent, two hundred and eighty-eight questionnaires were returned in all, sixteen of which were eliminated from further data analysis because of missing or incorrect information. Hence, data representing two hundred and seventy-two manufacturing companies across Pakistan were surveyed for the research, which relies on stakeholder theory and the resource-based view of the company. Hypotheses were then evaluated employing structural equation modeling (SEM). Therefore, the conclusion of the study highlights the crucial part that sustainable supply chain practice can play in assisting industrial companies to improve their social and environmental performance. These researchers indicated various limitations, such as data gathered from single participants, selected industries, and during a brief period. Hence, the authors proposed that future research is required to compare sustainability practices across industries in developed and developing nations and determine how they affect social sustainability initiatives.

Feng *et al.* (2018) studied whether or not political ties affect how environmental orientation impacts green innovation. The researchers investigated the effects of two categories of environmental orientation on two forms of green innovation, in addition to examining the importance of political relationships as a moderator. The authors received two hundred and fifty-three valid surveys from a total of four hundred and ninety-six sent out, for a response percentage of 51.0%. The study used hierarchical regression analysis to test their hypotheses using the survey responses from the two hundred and fifty-three Chinese manufacturing businesses. The research shows that both internal and external environmental orientation is significantly associated with both green product and green

process innovation. Furthermore, political relationships boost the positive effects of internal environmental orientation on green products and green process innovation while reducing the positive effects of external environmental orientation on green process innovation. Since the purpose of the study was to investigate the direct impact of environmental focus on green innovation, the authors suggested that, this correlation may be indirect. Therefore, other variables such as environmental strategy and top management commitment that influence green innovation may exist. Hence, other studies may yield more enlightening results by investigating the mediation effects of these variables. Lastly, they investigated how political ties can play a moderating effect. The authors suggested that other research can also look into how other variables can moderate the relationship between environmental orientation and green innovation.

Balasubramanian *et al.* (2020) examined how firm size has an impact on sustainable supply chain evidence from the United Arab Emirates. The study used the setting of the construction in the United Arab Emirates to shed light on the eco-friendly related role and contribution of various-sized businesses in the supply chain that is unknown from prior studies. The research analysed and comprehends speculated distinctions between small and medium-sized businesses (SMEs) and large businesses on three important supply chain environmental dimensions of sustainability which are; the extent of green supply chain practices implemented, the areas of strength of drivers and obstacles affecting the adoption of green supply chain practices, and the associated costs and benefits of adopting green supply chain practices. Employing the web-based survey system Qualtrics, questionnaires were distributed through email. There were four hundred and fifty-five valid returns in total, with a nearly equal distribution among SMEs and large businesses. It was discovered that large businesses had much higher levels of green supply chain practices adoption, more internal motivation for adoption, and fewer implementation obstacles than SMEs. However, it was discovered that SMEs weren't far behind major companies in terms of the environmental, financial, and organizational performance gains from green supply chain practices adoption. However, the conclusions of the study were limited to just one nation and one industry. Thus, more studies are required to improve the generalization of the study. The study solely took the effect of business size into account. Nevertheless, the environmental sustainability of businesses may also be influenced by additional business features including ownership and firm age.

Ahmed *et al.* (2019) investigated how institutional pressures promote green supply chain management methods to improve business performance. The study investigated how institutional pressure and a company's environmental attitude contribute to the adoption of green supply chain management strategies and the subsequent impact of green supply chain management on the performance of the firm. The data used for the study were gathered from two hundred and twenty-nine participants who worked as supply chain management professionals in different manufacturing companies through the purposive sampling technique. Using partial least square structural equation modeling, the study's hypotheses were examined. The research indicated that green supply chain management strategies are highly impacted by institutional pressures as well as environmental orientation. Also, the study outcome further demonstrates that green supply chain management methods have a significant impact on environmental, economic, and client effectiveness. Finally, due to the limitation of the study focusing on only economic and environmental performance, other performance outcome factors that are connected to green supply chain management strategies should be investigated in future research. Therefore, to investigate the performance measures that centre on economic, environmental, and social performance, scholars may apply a comprehensive triple-bottom-line approach.

Vidal *et al.* (2022), in their study considered the functions of entrepreneurial and sustainability orientations and supply chain stakeholder pressure on the implementation of a sustainable supply chain strategy. Considering the concurrent conditional impacts of both entrepreneurial orientation and sustainability orientation, the research examines the link between supply chain stakeholder pressure from consumers and suppliers for the implementation of social and environmentally sustainable supply chain management strategies. The researchers carried out the study with a specific focus on their interactions with their suppliers. The implementation of sustainable supply chain management strategies and the influence of entrepreneurial and sustainability orientations, the connection was measured using conditional process analysis in the research, as well as the correlation between stakeholder pressure and these strategies' implementation. The authors distributed survey questionnaires to each of the thousand four hundred and sixty-six businesses from a verified institutional database in the USA. The questionnaire received a reply from two hundred and twenty-nine individuals overall, however, fifty-nine of those replies were deemed invalid, leaving one hundred and seventy replies with an overall response rate of 12%. According to the findings, both entrepreneurial and sustainability

orientations concurrently play a moderating role in the influence of supply chain stakeholder pressure on the implementation of socially and environmentally sustainable supply chain strategy. The research surveyed was limited to USA organizations and the views of the sample taken from each company were used to undertake the investigation.

Agyabeng-Mensah and Tang (2021) explored the interplay between green logistics, green human capital, green competitiveness, social performance, and financial performance. The study examined how green human capital contributes to the adoption of green logistics strategies to increase green competitiveness and enhance social and economic performance. Survey questionnaires were sent out to One hundred and ninety-two manufacturing firms in Ghana. One hundred and sixty-three replies were received, of which one hundred and fifty-two of them were valid. With a valid response rate of 42.82%, the survey was conducted within two months, after which partial least square structural equation modeling was used to examine the data and test the hypotheses. The results show that green human capital does have a considerable impact on economic performance. Nonetheless, social performance and green competitiveness are not significantly impacted by green human capital. Additionally, employing green logistics strategies considerably raises social, economic, and environmental competitiveness. The association between green human capital and green competitiveness, as well as between social performance and economic performance, is mediated by green logistical strategies. Hence, green human capital impacts the effective adoption of green logistics practices, which results in building stronger or green competitiveness and better social and economic performance. The study was carried out in a specific national setting (manufacturing SMEs in Ghana). The authors posit that their research findings might not apply to larger businesses or other cultures. Thus, the study suggested that one of the survey's potential limitations is the results' generalization. The study recommend that subsequent studies evaluate and confirm the model by employing respondents from both small and large enterprises in other nations' behaviours, which lead to strengthening green competitiveness and improving social and economic performance.

Sajjad *et al.* (2020) assessed managers' opinions on the motivations and constraints of implementing sustainable supply chain management in New Zealand. The goal of the study is to look at the variables that influence or prohibit firms from implementing sustainable supply chain management (SSCM) strategies. To study sustainable supply chain management drivers and obstacles for firms, the study employed a qualitative method of

inquiry. Hence, to gain an insightful understanding of management's perceptions on how they view sustainable supply chain management adoption, a qualitative design was employed. The primary source of data was interviews with twenty-nine top managers. Firms were picked from a wide range of industries in order to reflect the perspectives of various companies concerning their involvement in sustainable supply chain management. In sampling, a purposive sample strategy was employed by the authors to help find relevant respondents to assist them in gathering information about sustainable supply chain management adoption. Client expectations, senior management dedication, moral and ethical principles of managers, and economic and operational advantages were the primary stated drivers used in the study while cost issues, strategic and structural constraints, client and supplier challenges, and an absence of effective policies, on the other hand, were listed as significant barriers to sustainable supply chain management adoption. The study findings indicated that several variables influence or limit organizations' adoption of sustainable supply chain techniques. The study further suggested that, because of the explorative nature of the research, the results cannot be extensively generalized. Therefore, a largescale questionnaire could be used in subsequent research to replicate and validate the findings of the investigation. Again, the authors primarily collected data through semi-structured interviews. However, other researches could employ a range of approaches, such as focus groups, questionnaires, and other related methods, to get more robust results.

Saeed *et al.* (2018) researched the Impact of institutional pressures and green supply chain management practices on environmental and financial Performance using a two-theory perspective. The study looked at whether internal and external green supply chain management methods face similar or dissimilar regulatory, market, or competitive pressures. The study employed institutional pressure to explain several types of pressures as well as resource dependence theory to investigate the influence of internal and external green supply chain management practices on performance. With this, an empirical investigation was carried out by gathering data from top management in the manufacturing business in Pakistan using a questionnaire survey. The partial least squares structural equation modeling approach was used to analyse data from two hundred and seven participants. After the analysis, normative pressures were shown to be the most relevant in both internal and external green supply chain management strategies, whereas coercive and mimetic pressures had a beneficial effect on both internal and external green supply chain management strategies. Again, internal green supply chain management strategies were found to be more effective in enhancing environmental performance, and they also had a

considerable effect on external green supply chain management strategies. On the other hand, external green supply chain management strategies, had a considerable beneficial impact on the economy's performance, whilst environmental performance also led to improved economic performance. A quantitative investigation had greater scope, but it compromised more comprehensive information. As a result, the authors recommended that consequent research can employ a multi-method approach to gain a more comprehensive understanding. Furthermore, consequent research may also investigate and discover the pressures to implement green supply chain management methods, as well as their degree of implementation that is, evaluating measures such as mediators or moderators to quicken up the entire process and assist the manufacturing sectors in Pakistan function better.

Raza *et al.* (2021) analysed the dynamic capability perspective on sustainable supply management strategies and sustainability performance. The purpose of the research was to develop and test a model of sustainable supply management strategies and sustainability performance from a dynamic capabilities' standpoint. More specifically, the research investigated whether sustainable supply management strategies influence sustainability performance and if the relationship was mediated by supply chain risk management and network capabilities and moderated by business size. Five hundred and forty-four companies agreed to carry out the questionnaire survey. However, four hundred and thirty-six supply management professionals from six manufacturing and logistics organizations in China using a survey questionnaire were received, with a response rate of 80.15% (436/544). After the analysis, the results indicated that sustainable supply management procedures have a positive impact on supply chain risk management, network capabilities, and sustainability performance. supply chain risk management as well as network capabilities serve as intermediaries between sustainable supply management strategies and sustainability performance. The findings show that firm size moderates the expected correlations differently depending on whether the business is small or medium-sized or large. The focus sample consisted solely of supply management experts from China; firms in developing countries differ in terms of resources and development rate, therefore caution should be exercised when generalizing the findings to other contexts. Therefore, the scholars suggested that future research could look into and verify our structural framework in additional emerging markets. In addition to supply management strategies practices, there are many methodologies for defining SSM-related practices in the research.

Barbosa *et al.* (2022) undertook a study to examine the implications of internationalization orientation on agri-food business sustainability through environmental collaboration from a developing economy viewpoint. The goal of the research was to examine the impact of environmental collaboration on long-term performance, particularly in internationally oriented firms. Furthermore, the study investigated if the size of the company affects these correlations. During the data collection, three hundred and eighty-eight major and medium-sized agricultural firms in Brazil participated in a quantitative study. After which Partial Least Squares were used to examine the data. Therefore, the research revealed a direct correlation between environmental cooperation and sustainable performance. The research adds to the body of knowledge by demonstrating how internationalization orientation enhances the impact of collaboration on sustainability performance. The study discovered that an increase in environmental collaboration has positively impacted all three aspects of sustainability; environmental, social, and financial, with a lesser impact on the financial aspect. Their analysis also demonstrated the financial performance of larger and medium-sized businesses differentiates. The research further builds on the relational view and natural resources-based view theories by demonstrating how competitive edge can be attained when a firm can convert itself, is environmentally associated with internal and external stakeholders, and incorporates collaboration as a relational component that positively impacts sustainable performance. For data gathering and analysis, only a quantitative methodology was used in this research. The researchers claimed that, it might have been possible for them to gain a deeper understanding of the relationship if they had looked at it using qualitative techniques like interviews and focus groups. Additionally, other studies might focus on examining each of the three aspects of sustainability performance, and also their integration and collaboration, because of the importance of each one.

Yuen *et al.* (2020) carried out a study to investigate how a structure-conduct-performance examination of the part that stakeholder involvement and sustainability integration play in maritime transportation. The study used the Structure-Conduct-Performance framework, which is based on the stakeholder management theory, to analyse the impacts of different stakeholders' involvement in sustainability incorporation and organizational performance of maritime transport companies. After the primary questionnaire survey was completed, the Singapore Logistics Association's web database was searched for four hundred and forty logistics firms, including both freight forwarders and third-party logistics. Taking into

account similar contacts, three hundred and ninety-four businesses in total were chosen. Two hundred shipping firms that were collected from the World Shipping Directory too were added. One participant from each of the sampled firms, the majority of which were multinational businesses was selected. Top management from the departments of Sustainability, Corporate Social Responsibility (CSR), or Health, Safety, Security, and Environment (HSSE) comprised the majority of the selected respondents. An aggregate of one hundred and fifty-six businesses from the five hundred and ninety-four questionnaires sent responded representing a 26.3% response rate. The results of the study showed how crucial it is to use more sustainability operations in a business context and involve stakeholders in the planning and management of sustainable maritime transport operations. Again, sustainability incorporation completely plays a mediating role on the impact of stakeholders' involvement on organizational performance. Also, the authors posit that there is a chance that the results will differ depending on business settings such as industries, national cultures, firm's origin, and location. Therefore, to widen the application of the findings, future research might look into these aspects.

Seman *et al.* (2018) reviewed how to understand stakeholder pressures in implementing environmental management strategies using stakeholder theory. The article's goal was to examine and explain the stakeholder pressures that organizations face when implementing certain environmental management strategies, such as green supply chain management and green innovation. The importance of the many stakeholders' contributions to the adoption of green supply chain management and green innovation strategies was not emphasized in the article. Stakeholder theory may serve as an underpinning theory to back the relationship between the adoption of environmental management techniques and organizational performance, the article suggests as it concluded after a number of reviewed existing literature.

Vanalle *et al.* (2017) investigated pressures, strategies, and performance in the Brazilian automotive supply chain via the lens of green supply chain management. The two primary objectives of the article were to examine the institutional pressures for the implementation of environmentally friendly supply in Brazilian automotive supply chain management and to assess the performance impact of such implementation. A sample frame made up of all the first- and second-tier suppliers of a Brazilian automotive supply chain connected to the Sao Paulo Industrial Federation was created for achieving the goal of the study. A systematic selection technique was used to choose eighty-three businesses at random from

among them and one business was picked for every five that were present in the sample frame. To ensure that the respondents' responses were sufficient and consistent, the responses from respondents were examined. Eleven of the fifty-two completed questionnaires were rejected due to obvious discrepancies. Then, data from the other forty-one questionnaires were compiled and analysed using PLS using the Smart PLS 2.0 M3 program. The findings suggest that the implementation of those methods only has a positive impact on the financial and environmental performance of the firms under investigation. Again, it showed that it was impossible to demonstrate a link between GSCM and operational effectiveness. In the study, just three sustainability factors were taken into account (economic, operational, and environmental). Additionally, only three sustainability aspects were taken into account in the current review (economic, operational, and environmental). To strengthen the results obtained from the study, additional research might take the social component into account. Also, according to the study, more study is required, especially in the context of emerging nations, on institutional pressures, performance, and environmental policies.

Feng *et al.* (2019) sought to understand the combined moderating impacts of moral leadership and the level of competition on customer orientation and business performance. Again, the research aimed at concurrently analysing the individual and collaborative moderating impacts of ethical leadership and degree of competition from an interactional perspective and the social learning theory. The authors selected companies at random from the Economy Commerce Committee's database of registered firms to increase the sample size. Their sampling frame, which included thousand five hundred companies, was formed by randomly choosing three hundred businesses from each province in China to obtain approval for research access. They used expert interviewers to call these chosen firms and clarified the scholarly objective of the research; five hundred and thirty-nine companies consented to take part. Eventually, two hundred and sixty-four samples were gathered which means, 17.6% of respondents responded in total. The findings demonstrate how organizations can more effectively use customer orientation for improving their performance when there is humane leadership and moderation leadership. While the moderating role is unaffected by the level of competition, the lack of moderation leadership might be more destructive for businesses functioning in such environments. Additionally, justice leadership impacts the business functioning within a more competitive market structure, helping businesses value the advantages of customer orientation. Even though

the variables in this study were measured using a time-lagged sample in two phases, the authors suggested that, it might be more informative to look into the moderating impacts of ethical leadership over a longer time frame. Then, there will be a conclusion on whether the correlation between customer orientation and company performance will be impacted by temporal variability in ethical leadership and competitive intensity.

Beigi (2021) assessed the consequences of less versus more innovative businesses in terms of external knowledge variety, competitive intensity, and innovation performance in logistics. The relationship between using a variety of search methods to find outside information and the level of competition and innovation in logistics is the main purpose of the research. In achieving the study objectives, she used a sample made of one hundred and forty-three thousand, six hundred and eight businesses from eighty-five different sectors in the given dataset. However, the developed questionnaire was completed individually by multiple references, which increases the accuracy of the data compared to databases that are solely focused on responses from related references. The findings of the study revealed that, although both antecedents show positive trends, their simultaneous occurrence partly dampens their respective positive relationships with logistics innovation. Also, all relationships show dynamic signs and when compared to businesses with greater rates of logistical innovation, the intensity of these relationships varies. The logistics innovation discussed in the study was about completed logistics innovations. Therefore, comparing the outcomes of all the innovative actions that came before could make for an intriguing topic of interest.

Hou *et al.* (2019) explored the entrepreneurial approach as a mediating factor and competitive intensity as a moderating factor on innovation and firm performance. In particular, the mediating effect of entrepreneurial orientation and the moderating role of competitive intensity is assessed to explore their troubling impacts on the aforementioned correlation. The research sought to clarify the impact of innovation on business performance in start-ups. The correlation between innovation, entrepreneurial orientation, and business performance is examined and verified using a conceptual framework built by the authors. One hundred and forty-three surveys were gathered from tech-focused start-ups in the Hefei National University Science Park in China. According to empirical data, exploiting and exploring innovations have a positive effect on a company's performance. The entrepreneurial orientation, however, partially plays a mediating role in the correlation between both innovations and business performance. What must be overlooked is that firm

performance and EO are moderated by competitive intensity. Its emphasis on tech start-ups as well as because the authors employed cross-sectional data, they were unable to accurately track changes in entrepreneurial orientation and performance over time were the constraints of the study.

Namagembe *et al.* (2019) examined Ugandan manufacturing SMEs' implementation of green supply chain strategies and business performance. The research aims to evaluate the connection between five green business strategies and business performance. The impact of each green practice on environmental performance, financial advantages, and economic costs is also examined in the research. Data were gathered through a cross-sectional survey of 200 manufacturing SME directors and owners in Uganda, Africa. To determine descriptive measures and investigate links between environmentally friendly activities and performance results, SPSS was employed. The impact of each strategy on performance results was tested using structural equation modeling. Various green strategies have varying effects on various performance metrics across various businesses. For instance, green purchasing and internal environmental management strategies significantly influence financial benefits, internal environmental management practices greatly impact financial consequences, and eco-design and internal environmental management strategies greatly impact environmental performance. Also, there were positive results for all three performance categories depending on the effective overall internal environmental management. Furthermore, the authors demonstrate how the results obtained from the study differ from other comparable studies carried out in developing nations and suggested potential causes of the variation. The primary drawback of the study was that it used a cross-sectional survey approach, which led to two methodological recommendations for subsequent studies. Using longitudinal study, which helps clarify causality, behavioural variables like green supply chain strategies are best understood as well as uncovering other relevant variables such as owner or manager's behaviours and situations, capable of significantly impacting specific green supply chain strategies implementation and its implied performance outcomes.

Table 2.2 Summary of the Empirical Review

Author(s) & Methodology	Key Findings
Charles Baah, Zhihong Jin, Liang Tang (2019) Quantitative study 140 questionnaires gathered	It was revealed that company and regulatory stakeholder pressures impact the initiation and implementation of green logistics practices, thereby improving the firm's environmental reputation and financial performance.
Yi-Chun Huang, Chih-Hsuan Huang and Min-Li Yang (2017) Quantitative study 380 questionnaires gathered	The study concluded that institutional forces have an impact on businesses' green supply chain endeavours as well as managers' environmental stewardship behaviours are also influenced by institutional pressures.
Sibel Yildiz Çankaya, and Bulent Sezen (2018) Quantitative study 281 questionnaires were gathered	The results of the study showed that, all the GSCM aspects used in the study aside from green purchasing, have been determined to be linked to a minimum of one aspect of performance.
Waqar Ahmed, Arsalan Najmi, Kuala Lumpur, Malaysia Muhammad Arif and Muhammad Younus (2019) Quantitative study 229 questionnaires gathered	The research indicated that green supply chain management strategies are highly impacted by institutional pressures as well as environmental orientation.
Natalia G. Vidal, Wellington Spetic Anderson, Simon Croom Knauss and Donna Marshall (2022) Quantitative study 59 questionnaires gathered	According to the findings of the study, both entrepreneurial and sustainability orientations concurrently play a moderating role in the influence of supply chain stakeholder pressure on the implementation of socially and environmentally sustainable supply chain strategy.
Kum Fai Yuen, Xueqin Wang, Yiik Diew Wong, Kevin X. Li (2017)	Sustainability incorporation completely plays a mediating role on the impact of

Quantitative study
156 questionnaires gathered

stakeholders' involvement on
organizational performance.

Aleksandr M. Kitsis, Injazz J. Chen (2021)

The study highlights the crucial role that green practices play in converting internal and external factors such as stakeholder pressure and top management commitment into higher economic and environmental performance.

Quantitative study
260 questionnaires gathered

Noor Aslinda Abu Seman, Norhayati Zakuan , Umi Kartini Rashid , Juzaimi Nasuredin and Nurazwa Ahmad (2018)

Stakeholder theory may serve as an underpinning theory to back the relationship between the adoption of environmental management techniques and organizational performance

Reviewed existing literature

Bojun Hou, Jin Hong and Ruonan Zhu (2019)

The study shows that, exploiting and exploring innovations have a positive effect on a company's performance.

Quantitative study
143 data gathered

Taiwen Feng, Dan Wang, Alan Lawton, Ben Nanfeng Luo (2019)

The findings demonstrate how organizations can more effectively use customer orientation for improving their performance when there is humane leadership and moderation leadership.

Quantitative study
264 data gathered

Asif, Muhammad Salman; Lau, Henry; Nakandala, Dilupa; Fan, Youqing; Hurriyet, Hilal (2020).

Adoption of green supply chain management practices through collaboration approach in developing countries. From literature

Reviewed literature

review to a conceptual framework

Source: Author's Construct (2023)

2.4 Conceptual Framework

This part of the study provides the theoretical background, and framework for this study as well as includes claims about the relationship between the variables used in this study. The framework explores the correlation between the variables that are thought to be crucial to understanding the nature of the situation under investigation. The main characteristics of the framework are a clear understanding of the variables that are significant in the study, the argument of how the variables associate with each other (this is done for the significant relationships that are hypothesized to occur among these variables), and the presentation the study's framework to help readers see and easily comprehend the hypothesized correlations.

2.4.1 Theoretical Background

This study seeks to achieve its proposed objectives using a framework that combines stakeholder theory, institutional pressure theory, and upper-echelon theory.

According to Freeman *et al.* (2021), in order to organize information that was becoming more crucial in strategic planning, Eric Rhenman in Sweden and the Stanford Research Institute both developed the stakeholder idea. Every firm tries to assist and gratify its stakeholders, including governments, owners, legislative groups, consumers, suppliers, societies, unions, and workers,' according to Freeman (1984), who developed the stakeholder theory and as a result, businesses are implementing green strategies such as GLS in response to demand from the many stakeholder groups, including those that are frequently impacted by a firm's decision-making, such as employees, customers, environmental organizations, and legislative organizations. In his published updated stakeholder theory, Freeman (2004) stated that organizations should prioritize serving the needs of their stakeholder groups and individuals rather than putting the maximizing of stakeholders' capital first. Its inception and early stages were geared toward improving the efficacy of corporate strategy and policy. Stakeholders are people or organizations who have the power to change organizational culture and goal-setting, as well as those who are impacted by these processes. Businesses have a history of upholding the shareholder-first philosophy and viewing profit maximization as the primary objective of operations (Tu and Wu, 2020). The existence and achievement of an organization, nonetheless, are based on how well it satisfies the requirements and expectations of its stakeholders and adds value, following the stakeholder theory (Rhee *et al.*, 2018). The unique feature of stakeholder theory's approach to strategy was its emphasis on the creation and management

of sustainable stakeholder relationships as the foundation of successful business operations. The research on stakeholder theory constituted a sharp break from the conventional perception of business as a means of maximizing returns to capital owners (Freeman *et al.*, 2021). In the earlier years, the major goal wasn't just a narrow empirical search for the reasons why one business performed better than another. Instead, it was the overtly normative notion of authority in improving their choices (Freeman *et al.*, 2020).

Earlier in the 1980s, DiMaggio and Powell (1983) introduced the institutional theory, which postulated that firms were attempting to fit into their environment by abiding by legitimate and statutory regulations on the one hand while pursuing societal fitness on the other. Some academics also assert that a company's behaviour may be influenced by a strong societal impact that drives it to take any step. Such a driver could be any form of social force, including custom, law, or regulation. To ensure coherence between strategic management and the institutional environment, institutional theory places a strong emphasis on incorporating normative values or coercive restrictions within the structure and strategies of a firm (Tu and Wu, 2020). Institutional theory is one of the key factors that encourage firms to embrace green logistics, according to Geng *et al.* (2017), they also stated that businesses were primarily impacted by external factors including government regulations. The well-established "Institutional theory" was chosen as a relevant perspective to assess green research in order to connect green practices to society (Caldera *et al.*, 2019). Hence, it is considered a process of developing institutions using rules and guidelines as definitive directions for social behaviour in order to reveal deeper and more robust aspects of social institutions. They concluded that, it focuses on the steps that lead to strategies becoming integrated into a system and recognized as the standard in a certain setting and has been employed to investigate how different institutional policies affect their commitment to the environment. In conclusion, the institutional theory provides a trustworthy theoretical lens for assessing factors that enable organizational practices to seek legitimacy, including elements like society, the social and legal environment Baumol *et al.* (2007) as stated in Caldera *et al.* (2019).

The notion that top management perceives their situations through their individual highly customized lenses was formally put forth by Hambrick, Donald C. and Phyllis A. Mason (Abatecola and Cristofaro, 2020). These unique interpretations of strategic issues result from top management differences in their backgrounds, values, attitudes, and other human traits. Researchers have investigated the impacts of chief executive officer qualities on firm

strategy and performance and also the impacts of top management structure and processes on firms' performance using the viewpoint of the upper echelons (Abatecola and Cristofaro, 2020). As they work to advance the study of the upper echelon's theory, academics gradually broaden the scope of their research from chief executive officers to top management (Huo *et al.*, 2020). According to the upper echelons theory (Hambrick and Mason, 1984; Hambrick, 2007), a firm's senior management is a crucial component of the strategic management process, and top managers' qualities influence both nonfinancial and financial results. This theory investigates the correlations between strategic decision-making and top management demographic variables, as well as between top management and firm performance (Huo *et al.*, 2020). Managers specifically have the chance to choose the best and most effective tactics to help their companies expand sustainably. For the adoption of strategic strategies, specific qualities of top managers such as psychological traits and observable traits (previous experiences, career paths, educational status, and age), are seen from the viewpoint of the upper echelon theory. To guide this study, the researcher, therefore, aim to use the upper echelons theory's (Hambrick and Mason, 1984; Hambrick, 2007) viewpoint. Again, in the upper echelon's theory perspective, there is a connection between firm performance and the managerial traits that a firm leadership adopts (Sehnem *et al.*, 2019).

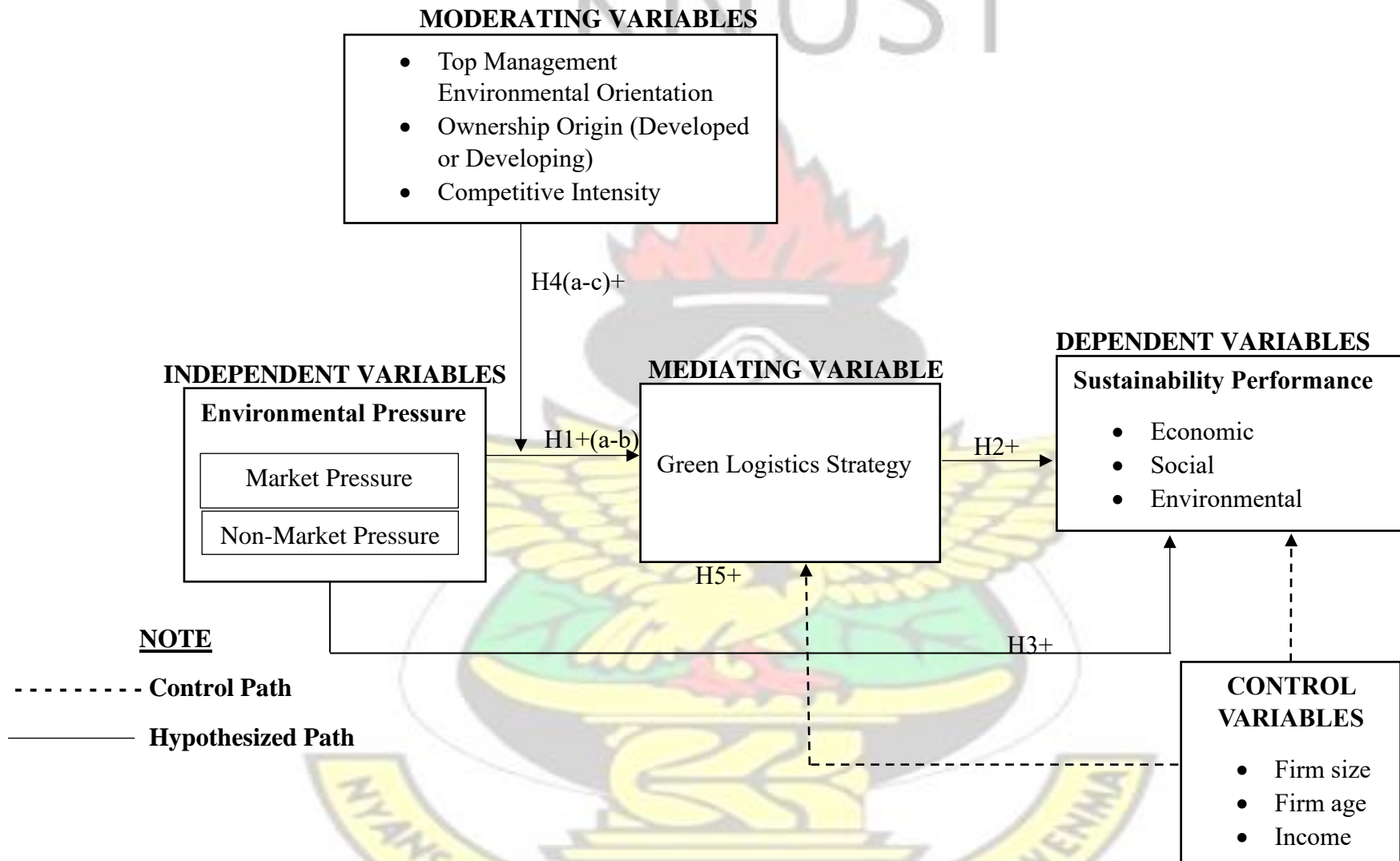


Figure 2.1 Conceptual Framework

SOURCE: Author's Construct 2023

2.4.2.0 Hypothesis Development

This section discusses the relationships presented in this study and hence draws on previous research to develop the below hypothesis.

2.4.2.1 Environmental Pressure (market and non-market) and Green Logistics Strategies (GLS)

Since manufacturing firms' pollution and hazardous material waste produced have an impact on stakeholders both directly and indirectly, environmental pressure from stakeholders is reported in the literature as a motivator for firms to engage in sustainability practices. Suppliers, consumers, rivals, employees, stockholders, government, and trade associations are a few of the stakeholders that have an impact on a company's decision to start eco-friendly activities (Tariq *et al.*, 2017). Specifically, the possibility that firms practice eco-friendly strategies such as green logistics strategy is high due to the combination of environmental pressures from these stakeholders. There is a strong theoretical basis for the diverse ways environmental pressures might lead to the implementation of green strategies (Kitsis and Chen, 2021). Zheng *et al.* (2020) reaffirmed the aforementioned by asserting that, institutional pressures are the crucial drivers guiding a company's environmental policies.

Building on this, Graham (2020) posits that, the long-term success of organizations rests partly on the firm's capacity to properly manage their relations with stakeholders within the industry in which they operate. For instance, many businesses restructure their operations to cut down on the release of carbon emission and other waste in the environment to avoid the strain of minimizing carbon footprints (Li *et al.*, 2021). Hence Mani and Gunasekaran (2018) studied how the adoption of green strategies is positively influenced by customer expectations. Thus, businesses must operate in a way that increases and satisfies consumer demand for eco-friendly products (Seman *et al.*, 2019). Also, Ahmed *et al.* (2020) also studied how non-market environmental pressures such as environmental pressure from the government are essential for businesses to implement environmentally friendly strategies in their firms. Thus, this suggest that businesses are compelled by the stakeholders to adjust their business strategies by adopting environmental friendly strategies (Vanalle *et al.*, 2017). It also implies that customer, supplier, and partner relationships as well as collaborative research and advancement will improve firms' environmental performance.

To wit, according to the stakeholder theory, pressure from stakeholders enables businesses to increase compliance while changing its current activities into environmentally friendly activities (Ahmed *et al.*, 2019). Therefore, it can be said that, under strong environmental pressure, businesses typically use their resources effectively and adopt eco-friendly strategies which include green logistics strategies. Conversely, despite the ability of stakeholders to influence the adoption of GLS, previous studies have limited results as to whether stakeholders when categorized into market and non-market environmental pressure can influence the implementation of GLS. Following the above, this study hypothesized that:

H1: Environmental pressure positively influence the adoption of green logistics strategy.

H1a: Market environmental pressure positively affect the adoption of green logistics strategy.

H1b: Non- market environmental pressure positively affect the adoption of green logistics strategy.

2.4.2.2 Green Logistics Strategy and Sustainability Performance

From a functional standpoint, firms that implement green practices such as green logistics strategy in response to stakeholder environmental pressure do so by cultivating long-lasting relations with stakeholders, gaining legitimacy, attracting investors, and enhancing their ability to perform financially, socially as well as environmentally (Baah *et al.*, 2021). He further stated that, the utilization of raw materials more effectively, the minimization of waste, the use of less energy, and less water usage all lower manufacturing costs. Green practices can have a positive effect on a company's performance in terms of sustainability through cost savings, competitive intensity, and ecologically friendly performance (Wijethilake, 2017). GSCM which comprises GLS is an essential organizational strategy for achieving, developing, and even maintaining an organization's sustainable economic, environmental, and social performance (Foo *et al.*, 2018). Green strategies play a critical role in increasing productivity, mitigating the negative impact, lowering regulatory costs, cultivating stakeholder relationships, and nurturing customer goodwill, which can all improve sustainability performance (Kitsis and Chen, 2021).

Failure to implement green practices in response to stakeholder pressures could result in sustainability-related dangers like damaged reputation and customer boycotts (Chowdhury and Quaddus, 2021). Therefore, most firms around the world strive to reveal their

operations and sustainable practices through annual reports or sustainability reports and do so in a way that takes into account the interaction of many environmental-related aspects (Almagtome *et al.*, 2020). Making sure a firm abides by environmental standards and criteria, the adoption of green initiatives not only enhances environmental performance but also lowers operational costs and hazardous waste and pollution (Huang *et al.*, 2017). Hence, by reducing air emissions, managing waste properly, conserving resources and energy, and guaranteeing societal safety, monitoring, and evaluation of environmental strategies help businesses determine how well they have been able to accomplish their environmental, social, and business goal (Agyabeng-Mensah, *et al.*, 2020).

According to Zhu *et al.* (2008), as stated in Çankaya and Sezen (2019), the manufacturing facility's capacity to cut costs connected to materials purchases, energy use, material recycling, waste disposal, and penalties for environmental mishaps will determine its sustainable economic performance. Also, Ahmed *et al.* (2020) posits that a decrease in waste, recycling and an improvement in return on assets are indicators of a company's financial performance. Hence, in explaining the above, Huang *et al.* (2017) stated that by recycling and reusing such material, firms may lower the expense of waste disposal. In the same vein, GLS is a way to comply with environmental laws in a nation, which prevents environmental fines and sanctions and lowers costs (Khan, 2019). As a result, GLMPS lowers operational costs and brings down the price of its products and services, thereby boosting market share, revenue, and profitability (Agyabeng-Mensah, *et al.*, 2020).

Furthermore promising, many SSCM techniques frequently have a direct impact on economic performance. For instance, Anheuser-Busch lowered their energy requirements and conserved millions of pounds of aluminium by creating lighter, smaller-diameter cans (Kitsis and Chen, 2020). Another instance is Interface, which modified the 95 hp pump's standard design to significantly lower the pump's costs and minimize its energy usage by 92% (Kitsis and Chen, 2020). Again, by establishing new standards and practices, higher environmental performance gives businesses the right to operate and even increases profit margins. When competitors find it difficult to match such high standards, businesses may increase their market shares through eco-friendly strategies (Feng *et al.*, 2018). As has been argued, better sustainability performance can be attained by implementing pollution prevention technologies. This results in zero waste, which means there are no costs associated with pollution control and substantial costs associated with waste disposal.

Also, it is well acknowledged that addressing environmental issues has numerous advantages for businesses; enhanced stakeholder relationships and gives the firm a more reputable brand image (Zaid *et al.*, 2018). Due to recent worldwide revolutions and changes, firms all over the world are now expected to carry out community-approved activities as part of their social responsibility efforts. As a result, the significance of social sustainability in preserving corporate sustainability has become apparent, and firms are unavoidably aware of stakeholder connections. The social performance element was looked at in terms of activities like charitable projects, the welfare of all parties involved, and possibilities for all employees to pursue education (Çankaya and Sezen, 2019). In essence, it was asserted by Zaid *et al.*, (2018), that, there was proof that businesses that invested in social responsibility saw measurable gains in terms of workers' and customers' satisfaction and innovation; factors that are likely to improve a firm's social performance. Rezaei-Moghaddam (2016) as stated in the above study, revealed that, manufacturing companies that contributed to social programs naturally place a strong emphasis on the health and security of the workforce and the society protecting them from things like exposure to harmful gases. In the instance of social sustainability performance, businesses must make sure that their manufacturing operations incorporate social activities that can improve the impact of facilities' operations on both internal (the workers) and external (the consumers and suppliers) communities (Zaid *et al.*, 2018).

Adopting green strategies is thought to enhance conditions for staff and the neighbourhood, where residents can live healthier lives. According to Elkington (2004) as stated in Zaid *et al.* (2018), implementing manufacturing operations that are eco-friendly and produce less pollution has a significant impact on both the social aspects of the workforce and society. Thus, they further made an argument that, businesses may accomplish several social objectives, including customer protection, market openness, and environmental preservation. Hence, organizations that include green strategies in their daily operations may benefit social sustainability performance

Again, organizations are encouraged to strengthen and maintain their relationships with suppliers and consumers by implementing GLS practices in order to achieve improved sustainable environmental performance (Seman *et al.*, 2019). Therefore, organizations must determine the origins of environmental issues within their purview (such as manufacturing, logistics, and sourcing) in order to comprehend fundamental environmental issues and develop workable solutions. Green practices such as GLS is an important

environmental performance driver, particularly for minimizing toxic pollution, which decreases the cost of stricter negotiations between the business and the government, customers, or non - governmental organizations to lower harmful emissions in order to promote sustainable requirements for environmental performance (Seman *et al.*, 2019). Thus, the capability of a company to reduce pollution, waste, use of dangerous substances, and environmental mishaps is measured by its environmental performance (Çankaya and Sezen, 2019). Therefore, green practices such as GLS according to Agyabeng-Mensah *et al.* (2020), guarantee pollution avoidance, responsible product use, and sustainable growth, all of which boost sustainability performance.

Hence, every attempt is made to lessen the negative effects that a firm has on the environment as part of green practices. These attempts reduce the use of solid/liquid wastes and harmful chemicals, lower the frequency of pollution of the environment, and enhance the healthy living condition for society, all of which have a beneficial impact on the advancement of sustainable environmental performance (Çankaya and Sezen, 2019). In addition, adopting a sustainable strategy like GLS decreases wastage and hazardous substances, lessens transaction and operating costs, promotes the efficient utilization of resources, and helps organizations adhere to environmental regulations (Seman *et al.*, 2019). Therefore, the above leads to the hypothesis below:

H2: There is a positive relationship between green logistics strategy and sustainability performance.

2.4.2.3 Environmental Pressure and Sustainability Performance

Global warming, as well as societal and governmental pressures for greater social and ecological responsibility, have caused many firms to place a high priority on sustainability. The popularity of sustainability increased attention from managers and has taken centre stage in many firms' strategic initiatives (Yong *et al.*, 2020). According to Manning *et al.* (2019), investors, clients, NGOs, and other relevant stakeholders are increasingly asking businesses to be more forthcoming and accountable for their sustainability initiatives. Particularly, when stakeholders actively attempt to influence a firm's decisions, their efforts might impact sustainability performance and their involvement may affect the top management decisions (Manning *et al.*, 2019). For instance, an organization's ability to fulfil its sustainability goals and objectives depends heavily on the environmental pressure from its suppliers (Foo *et al.*, 2019). Therefore, the best method to improve sustainable

financial performance is through stakeholder collaboration and corporate sustainable strategies. Also, the goal of environmental performance under stakeholder pressure is to lessen the adverse effects of the consequences that the firm generates (Ahmed *et al.*, 2020).

Generally, Awan *et al.* (2017) suggest that, stakeholder pressure may have an impact on the company's decision to adopt green initiatives, which are crucial for accomplishing sustainability performance. Governments and NGOs put pressure to promote sustainability, but they also expose corporate offenders and apply penalties. Therefore, when evaluating sustainability activities, governmental sanctions and environmental clean-up should not be disregarded (Kitsis and Chen, 2021). Therefore, this study hypothesizes that:

H3: Environmental pressure has a positive relationship with sustainability performance.

2.4.2.4 The Moderating Roles of Top Management Environmental Orientation, Ownership Origin, And Competitive Intensity.

This study postulates that there will be a significant moderating effect on the direct relationship between environmental pressure, green logistics strategy, and sustainability performance. Therefore, the purpose of this section is to emphasize the moderating impact of each of these constructs and how they relate to environmental pressure and green logistics strategy.

2.4.2.4.1 The Moderating Role of Top Management Environmental Orientation

Emphasis made on the role of employees such as top management as an influencing factor of environmental management success within a firm is increasingly gaining attention (Yusliza *et al.*, 2019). To wit, the researchers suggested that top management is in charge of choosing which strategies to implement, planning them, and effectively disseminating them throughout the firm. Therefore, the degree to which managers understand the significance of environmental issues is known as environmental orientation (Feng *et al.*, 2018). Hence, top management values are essential in ensuring that the strategies of an organization are realized to the point of improving firm performance. This means, top management's emotional attachment, desire, belief, and mindset in pursuing the firm's objectives is needed and its absence will result in failure to accomplish these objectives (Yusliza *et al.*, 2019). As a result, top management plays a significant role in implementing organizations' green policies because of their accountability for assigning resources and taking decisions that are required to bring about transformation within the firm. The values

of environmentally oriented managers significantly influence firm environmental sustainability (Jang *et al.*, 2017). They continue to say that, strong environmental qualities make people such as top managers more likely to understand the effects of environmental problems, accept responsibility for their actions, and help or engage in pro-environmental initiatives. It is therefore anticipated that, when top management of firms are environmentally oriented, they tend to be more environmentally conscious and adopt eco-friendly activities or strategies. The authors emphasized that, top management's environmental value plays a significant role in advancing their environmental commitment. Environmentally orientated sustainability has a significant impact on firm performance (Danso *et al.*, 2020).

Top managers now understand that social and environmental commitment must be taken into account to ensure a firm's long-term economic performance (Jang *et al.*, 2017). Aboelmaged and Hashem (2019) contended that firms with an efficient environmental orientation might switch out hazardous and toxic materials for brand-new ones or recycle waste and other materials. In conclusion, when stakeholders such as top management are environmentally oriented and have a strong tendency to participate, firms tend to be environmentally conscious (Newig *et al.*, 2018). This is in line with the statement made by Colwell and Joshi (2013) as stated in Yusliza *et al.* (2019), who claim that when a firm has a high level of top management commitment, adopting environmentally friendly policies is more probable to be taken care of. Based on this concept, this study proposes that for an organization to successfully adopt green strategies there must be significant top management environmental orientation. Again, the full incorporation of GLS within the firm's mission statements, strategies, and policies is more significant than simply fostering an organizational culture that values GLS. Therefore, top management's environmental orientation is essential. A wide range of stakeholders has an impact on top management, which results in tremendous pressure for firms to embrace various green practices (Agarwal *et al.*, 2018). In light of the above, the following hypotheses are put forth:

H4a: Top management environmental orientation moderates the relationship between environmental pressure and green logistics strategies.

2.4.2.4.2 The Moderating Role of Ownership Origin

Ownership origin in this study refers to the nation of origin of the business owner (Dagnelie *et al.*, 2018). It is said that, similar qualities are more likely to be possessed by individuals from the same country of origin (Dagnelie *et al.*, 2018). Therefore, according to Ali *et al.* (2017), political, social, and cultural practices must be taken into account by firms based in both developed and developing nations when making strategic decisions. According to Asif *et al.* (2020), business owners from developed nations have the adaptable capacity to enhance the environment. The concerns of particular stakeholders, such as authorities, shareholders, creditors, financiers, environmentalists, and the media, are viewed as being of utmost importance in developed nations (Ali *et al.*, 2017). However, businesses in developing nations have less environmental pressure (Ali *et al.*, 2017). Hence, it can be insinuated that the adoption of environmentally friendly strategies may be influenced by the culture and practices of the business owners' home country. In developing countries, there are inadequate environmental regulations, ineffective environmental protection policies, and insufficient pollution control (Asif *et al.*, 2020) which do not motivate firms to implement green practices such as green logistics strategy and individuals to be environmentally conscious. Due to the government's major concerns of wealth development and raising citizens living conditions, green strategies such as GLS are not given much thought in developing nations (Shetty and Bhat, 2022). Unlike developed nations, where citizens are more conscious of the environment, less environmental consciousness is present among citizens from developing nations (Shetty and Bhat, 2022).

It is not apparent whether all manufacturing firms owned by individuals or partners from developed countries are more aware of environmental regulatory requirements and use GLS to a greater extent than those from developing nations (Zhu *et al.*, 2017). Hence, this study seeks to find out whether ownership origin affects GLS implementation. Therefore, in light of the above, the following hypotheses are put forth:

H4b: Ownership origin positively moderates the relationship between environmental pressure and GLS.

2.4.2.4.3 The Moderating Role of Competitive Intensity

In this study, the term "competitive intensity" refers to the circumstance where there are numerous competitors, placing significant pressure on businesses to operate well in terms of sustainability performance Hou *et al.* (2019). Also in the literature, the company's competitive position, revenue, and profit are used to gauge its performance (Danso *et al.*, 2019). In addition, the authors said, a company's ability to generate ideas, be innovative, and survive is limited by restricted financial resources. Therefore, companies in developing economies face significant resource limitations; hence, they are strategically compelled to find innovative ways to boost performance. Ever since the industrial revolution and for a while now, firms had largely prioritized only operations that could increase profits. Social responsibility, however, has risen in significance as a result of increased competitiveness, a deteriorated environment, and more attention to living conditions (Yildiz *et al.*, 2019).

When rivalry is severe, businesses work to be innovative and, most importantly develop new strategies Hou *et al.* (2019). By focusing on environmental pressure businesses can increase their competitiveness while achieving green logistics strategy. Environmental pressure when exerted on firms can boost sustainability performance by implementing GLS (Baah *et al.*, 2020) which increases profitability and revenue while minimizing environmental damages (Trivellas *et al.*, 2020). Thus, implementing GLS makes a company more legitimate and recognized by regulatory bodies, which makes it easier to be more accessible in the markets. As a result, such a strategic perspective enables eco-friendly businesses to benefit from the environmental pressure from stakeholders, as well as develop a strategy that is more suitable for both their requirements and sustainability performance (Danso *et al.*, 2020). Again, pressure from stakeholders such as environmental pressure about the strategies and choices of a firm has been noted as necessary as well as a significant strategic asset that generates a durable competition (Jones *et al.*, 2018).

Contrarily, despite the significance of competitive intensity, previous research is limited as to whether the relationship between GLS and sustainability performance is affected by competitive intensity. Due to the above gap, this study anticipates that, environmental pressure will be linked to GLS. Hence, the following hypotheses are raised:

H4c: Competitive intensity positively moderates the relationship between market environmental pressure and GLS

2.4.2.5 The mediating role of green logistics strategy on the relationship between environmental pressure and sustainability performance.

Green logistics strategy is aimed to merge environmentally friendly strategies into a firm's logistics strategy (Awan *et al.*, 2022). These environmentally friendly activities are aimed to reduce the amount of carbon dioxide produced into the atmosphere which is a strategy for battling pollution and global warming (Jamil *et al.*, 2022). Also, as a consequence of minimizing waste, there is a maximization of resources used (Rasoolimanesh, 2022). Furthermore, due to the environmental impact caused by the activities of manufacturing firms on the environment, environmental pressure is exerted on the firm to adopt ecofriendly activities to achieve sustainability performance (Foo *et al.*, 2019).

According to Foo *et al.* (2018), GSCM strategies composed of GLS when implemented into a firm's strategy will drive the firm to achieve economic, social, and environmental sustainability performance. Hence this implies that environmental pressure when exerted on manufacturing firms can achieve economic, social, and environmental sustainability through the implementation of green logistics strategy. Also, suggested that stakeholder pressure which includes environmental pressure, and sustainable supply chain which is also composed of GLS both influence a firm's economic, social, and environmental sustainability performance. However, this study aims to find how green logistics strategy affects the relationship between economic, social, and environmental performance. Therefore, the study hypothesizes that:

H5: Green logistics strategy positively mediates the relationship between environmental pressure and economic sustainability performance.

2.4.2.6 Control variables

When examining the impact of green strategies such as GLS on firm performance, scholars often include a variety of control variables (Younis and Sundarakani, 2020). This research employs firm size, firm age, income, and firm industry as control variables to reduce the organizational side effects (Li *et al.*, 2019) and increases the generalization of the findings (Gouda and Saranga, 2018). These control variables were selected because they have a substantial impact and could have an impact on the study's findings.

First, since it has been noted by numerous studies as a key element influencing the adoption of green strategies, firm size is added as a control variable (Cherrafi *et al.*, 2018). This is because, larger firms are more likely to adopt green strategies due to their resource bases, whilst, small and medium-sized businesses may face significant difficulties in implementing these strategies due to the limited resource bases (Kumar and Rodrigues, 2020). The size of the firm is determined by the total number of workers (Danso *et al.*, 2019). Moreover, this study used the firm industry. Research studies have shown that different industries have different processes, demands, challenges, and opportunities for implementing green strategies such as GLS (Cherrafi *et al.*, 2017). Consequently, Kumar and Rodrigues (2020) and Vasco (2018) further stated that implementing these strategies is more likely to improve the performance of firms in specific industries. The age of a firm may also have an impact on how environmentally responsible the firm is. This is because, according to Al-Sheyadi *et al.* (2019) contemporary firms may produce goods more effectively, emit fewer emissions into the environment, and save more resources due to modern green facilities and technologies. Hence, firm age is determined by the number of years the firm was established (Danso *et al.*, 2019). A firm's income can also be a reason why the firm will want to implement GLS.

As a result, firm industry, firm age, firm size, and income are included as control variables in the current study.

CHAPTER THREE

RESEARCH METHODOLOGY AND PROFILE OF THE STUDY

3.0 Introduction

The methodology used to carry out the study is described in this chapter. It addresses the fundamental components of research design, including the study's purpose, the sorts of investigations used, the level of researcher interference, the study's location, the unit of analysis, and the study's time frame (Mitchell, 2020). Additional areas discussed include data collection method, study population and sampling design, data analysis techniques, validity and reliability testing, research philosophy, and how ethical considerations were taken into account at every stage of the study.

3.1 Research Philosophy

A researcher's way of thinking that leads to the discovery of fresh, credible information about the research subject is known as their scientific research philosophy (Žukauskas *et al.*, 2018). In other words, it serves as the foundation for the study, which includes selecting a method, formulating an issue, and gathering, processing, and analysing data. To Dougherty *et al.* (2019), identifying one's research philosophy is essential while engaging in scientific research since it explicitly states the objectives and anticipated results of research as well as the viewpoints for its evaluation. Moon *et al.* (2019) state that, the study design one selects when applying a certain philosophical perspective impacts the entire conceptual framework, outcomes, and contributions of a study. Hence, as it offers a clear theoretical foundation for a study, the application of research philosophy is crucial in a scientific investigation. Research philosophies can be distinguished using 3 types of research assumptions: ontology, epistemology, and axiology (Jagne and Woodburn, 2022). The epistemology position examines the fundamentals of knowledge and scientific realities, describes how knowledge emerged, what forms it has, and the way it effects the world, as stated by Kivunja and Kuyini (2017) by presenting logical justifications, epistemology aids in placing the studied question in the appropriate setting. A researcher may obtain knowledge from sources like intuition, authority, logic, and empirical knowledge when selecting this research approach (Kivunja and Kuyini, 2017). Interpretivism and positivism are two epistemological philosophies that are applicable to the social sciences. To wit, interpretivism is widely used in qualitative studies and founded on the idea that each scientific discovery should be interpreted within a social context rather than being quantitatively evaluated (Gichuru, 2017). Interpretivists contend that their

research questions are fundamental to human nature and should be approached as such. Alternatively, positivism is a perspective that employs analogies between the natural and social sciences to explain the knowledge under investigation (Gichuru, 2017). Precisely, it applies natural science research techniques to study social science problems (Eketu, 2017). Positivism uses empirical data to interpret existing knowledge solely from a scientific standpoint. On the other hand, the ontology approach explores the nature of existence through the lens of "physical and ecological systems" of the universe inhabited by people who have their values, with the reality observed from their personal perceptive (McManus *et al.*, 2017). According to Kivunja and Kuyini (2017), ontology is concerned with the kinds of objects that exist and how they interact. Following this perspective, a researcher makes certain assumptions about the specific problems under investigation. There are many ontological perspectives, such as constructivism and objectivism. When studying a phenomenon, objectivism takes the stance that because the researcher is not personally involved, they can evaluate the phenomenon objectively (McManus *et al.*, 2017; Ragab and Arisha, 2017). In the opinion of objectivists, every occurrence that has been researched may be regarded as an empirical unit that can be easily measured. Hence, quantitative research often adopts this approach. However, constructivism is described by inferences from people's interactions and contacts with the outside world (Moon *et al.*, 2019). Axiology examines how much moral standards and research methodology influence one another. It involves how researchers handle competing values, both their own and those of the research respondents (Jagne and Woodburn, 2022). The methodological choice, research approach, data collection practices, and analysis procedures used in this study will all be built on the above premises.

In the end, this study was influenced by a wide range of factors that are connected to the three core pillars of the research philosophy outlined above. To achieve sustainable performance, this study looked into how environmental pressure can influence green logistics strategy. Therefore, both the objectivism and positivism viewpoints were used for the study's objectives.

3.2 Research Design

The structure for assembling and analysing data on the variables stated in a particular research problem is known as the research study design (Ranganathan and Aggarwal, 2018). Specifically, the type of study design used in a research to answer a particular issue depends on the topic's structure, the research's goal, and the availability of resources (Ranganathan and Aggarwal, 2018). In research, the three types of research design frequently utilized are; exploratory, descriptive, and explanatory (Saunders *et al.*, 2007). Exploratory research is a helpful tool for finding out additional information, seeking out new viewpoints, formulating inquiries, and assessing events from a different perspective. It is especially helpful if you need to clarify how to comprehend a situation (Saunders *et al.*, 2007). Exploratory research can be done in three main ways: searching the literature, talking to professionals in the field, and holding focus group discussions (Saunders *et al.*, 2007). With descriptive study, its goal is to accurately depict the characteristics of people, events, or circumstances. This could be an expansion of, or a precursor to, an explanatory or exploratory piece of study (Saunders *et al.*, 2007). Alternatively, Saunders *et al.* (2007) defined explanatory research as those that demonstrate that variables have a casual correlation with one another. Hence, the focus is on examining a scenario or an issue to shed light on how various variables relate to one another.

The rationale of this study was to examine how environmental pressure influences a firm to practice GLS and achieve sustainability performance. To accomplish this, the research sought to accomplish some objectives. It became feasible to use two kinds of research design because of the distinctive nature of these objectives. An explanatory research design was used to explain the relationship between the variables which was suggested as hypotheses in the conceptual model. Conversely, descriptive research design was used to describe the characteristics or demographics of the population used for the study.

3.3 Research Method

Research methodology is the comprehensive process a researcher takes before starting a research project (Apuke, 2017). Depending on the general methods employed for data gathering and analysis, the methods of investigation employed in research design are classified into three types; qualitative, quantitative, and mixed methods techniques. The concept of qualitative research refers to a broad range of research methods that explore phenomena by looking at views, behaviours, and interactions without using mathematics, statistics, or manipulating numerical data (Basias and Pollalis, 2018). Apuke (2017) defines

quantitative research methods as the act of gathering numerical data and analysing it using mathematical tools, notably statistics, to understand a problem or phenomenon. On the other hand, the mixed method incorporates both qualitative and quantitative methods (Hong *et al.*, 2018).

This study used the quantitative research method. The quantitative research method starts with the formulation of a problem statement, the creation of a hypothesis or research question, the assessment of relevant studies, and the analysis of the data (Apuke, 2017). The quantitative method is for evaluating objective theories by investigating the relationship between variables (Rupa *et al.*, 2021). Hence, the quantitative approach's primary objective is to measure causal correlations. With quantitative research, the researcher is unrelated to the event being studied; she is neither impacted by it nor is she affected by it (Maarouf, 2019). Therefore, this study employed the quantitative research approach to examine the relationship between environmental pressure, green logistics strategy, and sustainability performance. And examine the mediating role of top management environmental orientation, ownership origin and competitive intensity.

3.4 Study Population

A study's population is any member of a specifically identified class of people, events, or elements (Oribhabor and Anyanwu, 2019). Therefore, any individual, group of individuals, or set that constitutes a population must have at least one characteristic in common. As a result, the study's population is determined by its aims and purposes (Oribhabor and Anyanwu, 2019).

The study's population constitutes five hundred and fifty manufacturing firms in the Association of Ghana Industries (AGI). This includes manufacturing firms that produce food and beverages, chemicals, pharmaceutical etc. Manufacturing firms were used for the study because they are considered to contribute to ecological pollution due to their operations (Agyabeng-Mensah *et al.*, 2020).

3.5 Unit of Analysis

The unit of analysis is a person or thing that the researcher gathers data from and provides a response to the questions of "what" and "who" are being researched (Kumar, 2018). The nature of the entity under study is fundamentally described by the unit of analysis (Khan, 2021). In the same light, it serves as a standard by which various entities in a study or research are compared and helps the researcher create criteria for the study because of its

natures or values (Khan, 2021). It is considered a programme, a firm, a class, a society, a state, and a nation (Assarroudi *et al.*, 2018). The researcher used the firm as the study's unit of analysis. The firm-level was suitable to address the research objectives in each instance, and although data were acquired from specific staff in the firm, the study is considered a firm-level analysis since their responses reflected their firms' position.

3.6 Sample Size and Sampling Techniques

Occasionally, limitations make it very challenging for a researcher to examine every component of a particular population. There is a requirement for the researcher to undergo a structured process known as sampling when there are strong reasons to analyse only specific components within a particular population. For instance, it may be impossible to evaluate the entire geographic area or location in the limited amount of time provided for the investigation. Additionally, due to time, resource, and other constraints, it might be extremely difficult to analyse the entire population. Therefore, it becomes essential, rational, and only practical to investigate a sample, or small subset, of the population. Sampling is the practice of treating a subset of a population or universe as if it were the entire population or universe (Oribhabor and Anyanwu, 2019). Hence, a reasonable fraction of the population should be sampled for a study to be relevant and credible which would enable the findings to be reliably generalized. Thus, a sample is defined by Salant and Dillman (2004) as stated in Oribhabor and Anyanwu (2019) as a group of people or volunteers chosen for a study from a wider population. The study also emphasized the necessity for a proper sample size because an inadequately small sample size is not a trustworthy representation of the population and can result in Type I error, which is the propensity to wrongly reject a particular result when it should be accepted. A type II error, however, entails adopting a particular conclusion when it should not be accepted as a result of extremely high representative sample. Two categories of sampling techniques available are; probability sampling and non-probability sampling. The probability sampling technique ensures that any person in the population has an equal chance of being chosen because the sample is chosen according to definite mathematical criteria (Oribhabor and Anyanwu, 2019). For example, simple random, stratified random, cluster, and so on. Whereas, with the non-probability technique, individuals in the population are not given an equal chance of being chosen which defies all mathematical rules, not following a set formula or rules but instead, mostly dependent on the availability premise (Oribhabor and Anyanwu, 2019). For example, quota, convenience, snowball, purposive, and many more.

There were strong justifications for the researcher in this study to focus on just a portion of the whole population. Mainly, it was not realistic to analyse each of the 550 manufacturing firms representing the population due to logistical and human resource limitation. Despite the logistical and human resource limitations, the time needed to finish this study just did not allow for such a thorough coverage. It made sense for the study to select an optimal sample from the available population. Hence, using the purposive sampling technique, manufacturing firms were chosen because they engage in a lot of logistics operations. Also, a convenience sampling technique was employed to choose 300 manufacturing firms based on their location. Specifically, the sample size totalled 300 managers; one from each firm. This includes operations, logistics, or transportation, supply chain as well as procurement, or purchasing managers. These categories of managers were selected for the study because of their awareness, skill, and personal experience in their respective firms.

3.7 Data Collection Method

Regardless of the topic, gathering data is the foundation of any study. Each research project begins with a collection of problems that need to be addressed (Parveen and Showkat, 2017). Thus, data collection is the process of meticulously gathering the needed information with the least amount of distortion possible to guarantee that the analysis can yield results that are trustworthy and feasible (Parveen and Showkat, 2017). This section includes a questionnaire description, table of constructs and sources, pilot testing and data collection procedure, among others.

Data can either be primary data or secondary data. Primary data are data that the researcher has personally gathered; older versions of the facts are not publicly accessible (Parveen and Showkat, 2017). Specifically, it is deliberately gathered information and it is regarded as being very genuine. A variety of ways, including surveys, interviews, focus groups and many more., can be used to gather primary data. Subsequently, Parveen and Showkat (2017) explained that secondary data is information that has been obtained, prepared, and made publicly available. It is the data that the researcher compiled from both past studies and additional sources. Government reports, census information, departmental records, etc. are examples of secondary data. Questionnaires were the main instruments used to collect data for the study. A well-structured questionnaire was created to collect primary data from all sampled respondents. The responses served as a tool for testing each of the variables in

the study's conceptual framework. To do this, a single set of questionnaires was created for each respondent.

The questionnaire was derived from earlier studies (Baah *et al.*, 2019; Song *et al.*, 2020; Kitsis and Chen, 2021; Shetty and Bhat, 2022; Shi and Tsai, 2022; Vidal *et al.*, 2022) and adapted for this study's setting. The questions were divided into five main categories; A to F. Section A requested information about the organization's profile, including the firm ownership type, and annual income, among others. Also, environmental pressure, green logistics strategy, and sustainability performance were the main topics of Parts B, C, and D, respectively. Finally, parts E and F were top management environmental orientation and competitive intensity. The majority of the questions on the questionnaire were closed-end questions graded on a seven-point Likert scale. Table 3.1 below indicates the constructs and their sources.

Table 3.1 Summary of Measurement Items.

Variable	No. of Measurement Item	Source
Environmental Pressure		(Vidal <i>et al.</i> , 2022; Song <i>et al.</i> , 2019; Shi and Tsai, 2022)
Market	4	
Non- Market	4	
Green Logistics Strategy	7	(Baah <i>et al.</i> , 2019)
Sustainability Performance		(Zaid <i>et al.</i> , 2018; Raza, <i>et al.</i> , 2022; Çankaya and Sezen, 2018)
Economics	6	
Social	5	
Environmental	5	
Top management Environmental Orientation	6	(Cao and Chen 2018; Kitsis and Chen, 2021)
Competitive Intensity	3	(Taherdangkoo <i>et al.</i> , 2018)
Ownership Origin	1	(Shetty and Bhat, 2022)

Source: Authors Construct (2023)

Pilot study is frequently carried out to evaluate the viability of methodologies, procedures, questionnaires, and interviews, how they interact in a particular setting, and also highlight moral and practical concerns that might impair the actual research (Fraser *et al.*, 2018).

Researchers may alter item phrasing, the sequence in which questions are provided, or the instrument style if individuals have trouble filling out survey questionnaires. Fraser *et al.* (2018) also suggested that pilot studies should be carried out to identify and mitigate risks associated with possible future research design, sample size, sampling techniques, data collection, data management, and data analysis, according to a substantial body of literature. For this study, ten (10) respondents were chosen using the convenience sampling method for the pilot study. The 10 (ten) respondents were chosen based on the recommendation provided by Fink (2003b, as cited by (Saunders *et al.*, 2019) which states that a least ten (10) replies are appropriate for pilot testing. The pilot studies aided the researcher in spotting design flaws, enhancing data collection and analysis procedures, familiarizing and educating the study team, and gathering vital respondent data.

Final revisions were done after pilot testing to create a more reliable and effective questionnaire which was given to the respondents to complete. Before being given the survey to fill out, research respondents were initially made aware of the aim of the study and given assurances that their responses and identities would be kept private and anonymous respectively.

3.8 Data Analysis Method

The data analysis method can be quantitative, qualitative, or mixed. However, quantitative analysis was employed to undertake this study. Quantitative data analysis is the systematic method of collecting and interpreting quantifiable and verifiable data known as quantitative data analysis (Beigi, 2021). Specifically, Beigi (2021) explained that it is a statistical, graphical evaluation, or analysis method for quantitative data. Quantitative analysis employs mathematical processes to explore the qualities of data that are presented as numbers (Walliman, 2011). In this study, this procedure was used to analyze the information gathered. First of all, the survey was edited to remove any potential bias. This editing process involved verifying each questionnaire for consistency and completeness. The questionnaires were also examined for any potential blank responses and the proper measures to be taken. Then, Smart PLS Software was used to analyze the data gathered. SmartPLS is a statistical software package created by German academic software engineers for researchers looking into theories and also for SEM analysis utilizing the Ordinary Least Square estimation approach (Ong and Puteh, 2017). PLS-SEM is used for data analysis to test the study's measurements and conceptual models as well as to look at the correlation between the variables in the study's conceptual model (Ong and Puteh, 2017). Again, it is

generally employed for data analysis because of its ability to test all variables at once (Ong and Puteh, 2017).

This study used the software to provide inferential analysis as part of the data analysis process to examine the many hypotheses that have been put forth as well as a correlation analysis between the variables to determine the degree of correlations.

3.9 Tests for Validity and Reliability

Validity is an indicator of the way a survey instrument accomplishes its intended purpose, and it is focused on whether the survey instruments examine the behaviour that it is meant to measure (Surucu and Maslakci, 2020). While reliability is a measure of the consistency of the observed values acquired from multiple testing using the same survey instrument and the same environmental conditions (Surucu and Maslakci, 2020). Despite being likely to be related, validity and reliability indicate separate aspects of the survey instrument. As a result, researchers must evaluate the validity and reliability of the survey instrument they want to utilize. Hence, these are the two requirements the survey instrument must meet.

Throughout the course of the study, the researcher took reliability and validity into account. This was done through a review of the questionnaire and pilot testing. Also, after the data was collected and edited, the researcher conducted statistical tests such as Cronbach's Alpha, RHO, Average Variance Extracted (AVE) etc. to determine the validity and reliability of the data.

3.10 Ethical Considerations

The conduct of a study is governed by moral standards known as research ethics, which are common in many other disciplines. These rules guide the study's conduct from its inception to the completion and dissemination of results and beyond (Qamar, 2018). Qamar (2018) added that scholars should do their work following an ethic of respect for any person who may be participating in the study they are conducting and should treat each person with decency and compassion. This ethic of respect should also extend to the researcher herself. One of the tasks to be completed before beginning research is getting a participant's informed permission, which requires them to voluntarily accept to participate in the study. Again, researchers are expected to handle participant data in a safe and anonymous manner, and to do so, they must abide by the laws governing the collection, utilization, and preservation of personal information.

This study is no different from other studies in that it addresses ethical concerns. The researcher made sure every piece of writing taken from other researchers was properly recognized in the study. Also, the researcher took care to incorporate all pertinent information without excluding anything or adding anything on purpose to influence readers in favour of a specific opinion. Regarding moral responsibility, all respondents' informed consent and permission were obtained, enabling them to voluntarily engage in the study without being coerced or deceived in any way. Also, the researcher gave the respondents a full explanation of the study's objectives and gave them assurances of its high confidentiality which was correctly guaranteed throughout the activity. Also, the researcher was not made aware of the respondents' identities because all of the questions were put together randomly without reference to any distinct categories or respondents' names.

3.11 Profile of Manufacturing Firms in Ghana

The study was conducted entirely in Ghana and aimed to gather information from manufacturing firms. There are different types of manufacturing industries in Ghana. For example, automotive, food and beverages, electronics, cosmetics, pharmaceuticals, etc. The manufacturing firms were chosen for this research because of their performance in environmental sustainability measures (Bour *et al.*, 2019). Nonetheless, aside from the industry being identified as the major source of pollution and harmful substance emission, it is under its industrialization strategy (a plan to turn Ghana into a manufacturing powerhouse in the African region and compete internationally) (Afum *et al.*, 2020). Hence, Ghana's manufacturing industry is experiencing a huge makeover. The manufacturing industry in Ghana contributes roughly 4.6 billion Ghanaian cedis (GHS), or 755.6 million US dollars, to the nation's gross domestic product (GDP), as of the second quarter of 2020 (Statista, 2023) which is a notable contribution. Hence, Ghana's economy cannot be addressed without mentioning the crucial significance that the manufacturing industry plays. It helps poor communities flourish, provides job possibilities for skilled and semi-skilled unemployed people, and significantly boosts local revenues. Nonetheless, it is important to recognize the negative impact manufacturing operations have on the environment. These could include the discharge of harmful trash into waterways and the release of hazardous gasses into the atmosphere, which could impact the quality of the air (Gyasi-Mensah and Hu, 2018). Therefore, practicing green logistics strategies can impact a firm's sustainability performance.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND DISCUSSION OF RESULTS

4.0 Introduction

The study's results are presented in this chapter. The chapter presents response rate and response bias, data editing, coding and data entry, demographic characteristics of respondent and company profile, descriptive analysis of study variables, inferential analysis, evaluation of Partial Least Squares-SEM results, structural model analysis and hypothesis testing, and discussion of findings.

4.1 Response Rate and Response Bias

A response rate is the proportion of the respondents in a study who consented to participate (Frey, 2018). It is a usual practice for determining the quality of data. Also, the validity of estimates, analyses, and inferences in scholarly research may be impacted by low response rates, which is why response rates are a crucial indicator for education surveys (Frey, 2018). As opposed to this, response bias refers to systematic errors or misconceptions in data that result from how respondents give their replies or information while conducting a survey, questionnaire, or interview (McGrath *et al.*, 2010). It happens when there is a recurring pattern of discrepancy between the responses gathered and the actual features of the population under study.

550 firms were identified from the AGI, and 300 of the firms were reachable, hence, a total number of 300 questionnaires were sent to firms that were reachable. Out of the 300 questionnaires, 200 were returned after two weeks, and an additional one week, received 25 more questionnaires, making a total of 225 questionnaires returned. However, 5 of the questionnaires were incomplete. Hence, 5 of the questionnaires were not usable, leaving 220 questionnaires used for the analysis. To wit, the valid response rate for the study is 73.3%. According to Maxfield and Babbie (2011) as stated in Nix *et al.* (2017) a response rate of no less than 50% is suitable for analysis. Therefore, 73.3% is considered adequate for the analysis. Additionally, the questions in the survey questionnaires were carefully crafted to be as unbiased as possible in order to control for response bias. This was done by reducing misleading or laden language.

4.2 Data Editing

Aiming at enhancing the accuracy, reliability, and sufficiency of the data and ensuring that it's appropriate for the intent for which it was gathered, editing the data is important. Data editing entails checking the data for consistency, identifying errors and exceptions (values that are very larger or smaller compared to the rest of the data), and correcting the errors to make it suitable to achieve the research objectives (De Waal, 2009). The significance of data editing is found in the fact that it contributes to maximizing the value of data, making it crucial to make sure the data utilized is without errors that may have occurred throughout their gathering or entry (De Waal, 2009).

In this study, the researcher edited the data collected to verify its completeness before entry. In verifying, the researcher verified that all sections are completely filled up and that none contain errors or missing data. Also, entered data were checked to ensure no duplication during entry.

4.3 Coding and Data Entry

After the questionnaires distributed were returned, the researcher started with coding as well as entering the raw data. Here, coding is the process of converting questionnaire sample responses into codes that allow for computerized analysis to be carried out (Stopher, 2012). Whereas the procedure of moving these computer codes from the survey form or other intermediary medium to the computer is known as data entry (Stopher, 2012).

To begin with, the researcher gave each completed questionnaire a special identification code before data entry started in Microsoft Excel. The rows in Microsoft Excel were used to represent the respondent of the study whilst the columns were used to represent the variable used in the study. Following the coding of each questionnaire, the raw data were entered and each row represented each questionnaire.

4.4 Demographic Characteristics of Respondents and Company Profile

The study's participants' demographic characteristics were looked at. The characteristics of the study's organization and the members of the organization who answered the questionnaire were briefly described in this section. Gathering demographic data was an essential component of the study in order to fairly comprehend the questions raised by the subject. The characteristics that were looked at were gender, education, firm age, firm size, firm income, and management position.

Table 4.1 Demographic characteristics of firms and respondents

Variable		Frequency	Percentage (%)
Gender	Male	142	64.5
	Female	78	35.5
Education	No Formal Education	1	.5
	Basic/Primary	6	2.9
	Secondary	11	4.9
	Bachelor's Degree	157	71.2
	Master's Degree	45	20.5
Firm Ownership Origin	Developing	177	80.5
	Developed	43	19.5
Management Level	Top Level	13	6.0
	Middle Level	153	69.5
	Low level	54	24.5
Firm Size (No. of employees)	6-9 Employees	7	3.2
	10-29 Employees	61	27.7
	30-50 Employees	109	49.5
	More than 50 Employees	43	19.6
Firm Age	Less than 1 year	3	1.4
	1-5 years	16	7.3
	6-10 years	83	37.7
	11-15 years	66	30.0
	16-20 years	41	18.6
	21 and above years	11	5.0
Firm Income (In Ghana Cedis)	10,001- 50,000	1	.5
	50,001- 100,000	9	4.1
	100,001-150,000	27	12.2
	150,001- 200,000	101	45.9
	200,001-500,000	71	32.3

	500,000 and above	11	5.0
Firm Industry Type	Electronics	2	1.0
	Food, Water and Beverages	99	45
	Chemicals	4	1.8
	Oil and Gas	17	7.8
	Clothing and Cosmetics	11	5.0
	Cleaning Agents	14	6.4
	Wood, Rubber and Metals	65	29.5
	Pharmaceutical	1	.5
	9 Others	7	3.0

Source: Field Survey (2023)

Table 4.1 above shows the result of the analysis. Concerning the gender of the respondent, 142(64.5%) were males whilst 78(35.5%) were females. This result implies that more men than women took part in the study, most likely as a result of the nature of the job description. With regards to their educational level, 1(0.5%) of the respondent had no formal education, 6(2.9%) had basic/primary education, 11(4.9%) had secondary education, 157(71.2%) had also acquired their bachelor's degree whilst 45 (20.5%) had their master's degree. This shows that the respondents had some level of education, which is why they were able to comprehend the study's objectives and reply appropriately. It was also revealed from the results that, 13(6.0%) of the respondent were top-level managers, 153(69.5%) were middle-level managers and 54(24.5%) of them were low-level managers. The result implies that those who participated constitute significant participants who are integral to the operations of their organization and are involved in strategic decision making.

Furthermore, in Table 4.1 above, 177(80.5%) of the manufacturing firms who partook in the study are owned by owners whose origins are developing countries while 43(19.5%) of owners were from a developed country. This result implies that the firms engaged in the survey are owned by citizens from developed and developing nations. Hence, the responses are appropriate for the study. The study also enquired about the firms' size in terms of the number of employees. It was revealed that 7(3.2%) out of the 220 valid response rates had

6-9 employees, 61(27.7%) had 10-29 employees, 109(49.5%) of them had 30-50 employees while 43(19.6%) had more than 50 employees. This result implies that most firms that undertook the study were medium and large firms as defined by Ghana Statistical Service (Asare, 2014). For the firm age, 3(1.4%) of the firms involved in the study were less than 1 year in operation, 16(7.3%) had operated between 1-5 years, 83(37.7%) were between 6-10 years in operation, 66(30%) had operated for 11-15 years, 41(18.6%) had also operated for 16-20 years while 11(5.0%) had operated for 21 and above years. This suggests that established businesses rather than new businesses are the study's primary focus, which could have an impact on how the results are generalized.

For the average income of the firms in the population was presented in Ghana Cedis, to wit, Table 4.1 above shows that 1(0.5%) of the valid response rate make an average revenue between 10,001-50,000 Ghana Cedis, 9(4.1%) make an average revenue between 50,001-100,000Ghana Cedis, 27(12.2%) make between 100,001-150,000 Ghana Cedis, 101(45.9%) make 150,001- 200,000 Ghana Cedis while 71(32.3%) make 200,001-500,000. This result also implies that the sample is representative of firms with average revenue.

4.5 Descriptive Analysis of Study Variables

Descriptive analysis in a study can be used to organize data into a concise summary by outlining the connections between variables in a sample or population (Kaur *et al.*, 2018). The descriptive analysis of the study describes how respondents felt about the variables in the research in terms of how they are linked to the study's topic. Descriptive analysis in this study provides an illustration of the responses from the respondent. In a nutshell, it summarizes the raw data from the sample.

The Likert scale, which has a range of 1 to 7, was used to measure the degree of agreement, and the score is compared to the scale to ascertain how often the indicators of the variables occur in the different firms.

Table 4.2 Descriptive statistics

Code	Item	Mini mum	Maxi mum	Mean	Std. Deviation
EP(M)1	My firm's key supplier/buyer requires that the firm should adopt sustainability practices.	1	7	4.85	1.469
EP(M)2	My firm's key supplier/buyer requires that the firm should adopt green logistics strategy.	1	7	4.46	1.561
EP(M)3	My firm would have lost its key supplier/buyer if it had not adopted sustainability practices.	1	7	4.61	1.573
EP(M)4	My firm would have lost its key supplier/buyer if it had not adopted green logistics strategy.	1	7	4.81	1.554
EP(NM)1	Environmental regulations are established by the government for business activities (such as waste emissions, cleaner production, etc.)	1	7	5.05	1.660
EP(NM)2	Regulations for resource conservation and resource-saving are regulated by the government.	1	7	4.80	1.716
EP(NM)3	Environmental penalties are severe and impact my firm negatively.	1	7	5.14	1.655
EP(NM)4	The media monitors our business operation.	1	7	5.83	1.404
GLS1	My firm prefers the use of reusable and recyclable materials.	1	7	4.33	1.503
GLS2	My firm promotes the use of eco-friendly materials for inner and outer packaging.	1	7	4.44	1.506
GLS3	My firm uses sustainable transport methods to help cut CO2 emissions.	1	7	4.49	1.558
GLS4	My firm monitors and evaluates environmental regulations and practices.	1	7	4.80	1.525
GLS5	My firm ensures that, environmental information is shared across the logistics network.	1	7	4.68	1.564
GLS6	My firm engages in training the employees in green logistics strategy.	1	7	4.54	1.497
GLS7	My firm has setup green reward schemes.	1	7	2.25	1.025
SP(E)1	There is a reduction in the cost of purchasing materials in my firm.	1	8	4.58	1.438
SP(E)2	There is a reduction in the cost of energy consumption in my firm.	1	7	4.95	1.562
SP(E)3	There is a reduction in cost for treatment and discharge of waste in my firm.	1	7	5.28	1.431
SP(E)4	There is a reduction in cost for environmental mishaps in my firm.	1	7	5.00	1.595
SP(E)5	There is an average profit growth in the firm.	1	7	5.36	1.470
SP(E)6	There is an average growth in market share in the firm.	1	7	5.17	1.526

SP(S)1	My firm has improved with regards to employees' occupational health and safety.	1	7	4.80	1.765
SP(S)2	My firm has improved in lowering the adverse impact of products and processes on the local community.	1	7	5.07	1.740
SP(S)3	My firm has strengthened its relationship with the community and stakeholders	1	7	5.02	1.711
SP(S)4	My firm actively communicates with its consumers about sustainability values.	1	7	4.43	1.760
SP(S)5	My firm has improved the living quality of surrounding communities.	1	7	5.28	1.409
SP(EN)1	My firm operates on low discharge of noxious chemicals into the air and water.	1	7	4.87	1.728
SP(EN)2	My firm operates on less waste and recycling of materials during the manufacturing process.	1	7	5.07	1.818
SP(EN)3	My firm increases the consumption of renewable energy and sustainable fuels.	1	7	4.87	1.655
SP(EN)4	My firm reduces the frequency of environmental mishaps.	1	7	4.81	1.720
SP(EN)5	There is an enhancement in the firm's environmental state.	1	7	4.99	1.695
TMEO1	The top management of my firm attaches importance to understanding and mastering environmental protection measures.	2	7	6.16	1.097
TMEO2	The top management of my firm attaches importance to the impact of relevant environmental laws and regulations on the firm.	2	7	6.21	1.086
TMEO3	The top management of my firm attaches importance to the adverse effects of the production and business activities on the environment	1	7	6.21	1.103
TMEO4	Top management usually satisfies requests for resources necessary for improving sustainability.	1	7	4.97	1.645
TMEO5	Top management is supportive of efforts to improve sustainability initiatives.	2	7	5.10	1.622
TMEO6	Top management considers sustainability an important part of firm's strategy.	2	7	5.53	.978
CI1	Our industry has a large number of competitors.	1	7	4.56	1.882
CI2	Our customers expect more environmentally friendly products due to high competition.	1	7	4.48	1.846
CI3	Competitors in our industry are very competitive when it comes to sustainability issues.	1	7	4.88	1.444

Source: Field Survey (2023)

Hence, the various constructs' descriptive statistics are shown in Table 4.2 above. From Table 4.2, the descriptive environmental pressure (EP) has two sub-constructs which are market (M) and non-market (NM). The Market environmental pressure sub-construct has four items. For instance, the item "My firm's key supplier/buyer requires that the firm should adopt sustainability practices" has a mean of 4.85 and a standard deviation of 1.469. The item "My firm would have lost its key supplier/buyer if it had not adopted green logistics strategy" has a mean of 4.81 and a standard deviation of 1.554. The values indicate that managers responded indifferent concerning the influence on market environmental pressure on green logistics strategy.

Under the Non-Market environmental pressure sub-construct, there are four items. The item "Environmental regulations are established by the government for business activities (such as waste emissions, cleaner production, etc.)" has a mean of 5.05 and a standard deviation of 1.660. The item "Regulations for resource conservation and resource-saving are regulated by the government" has a mean of 4.80 and a standard deviation of 1.716. The values indicate that managers responded indifferent concerning the influence on non-market environmental pressure on green logistics strategy.

Furthermore, in Table 4.2, the descriptive statistics for Green Logistics Strategy (GLS) were shown with seven items measuring it. The item "My firm uses sustainable transport methods to help cut CO₂ emissions" has a mean of 4.49 and a standard deviation of 1.558. The item "My firm prefers the use of reusable and recyclable materials" has a mean of 4.33 and a standard deviation of 1.503. Also, the item "My firm ensures that environmental information is shared across the logistics network" has a mean of 4.68 and a standard deviation of 1.564. The values indicate that managers somewhat agree with items of GLS. Sustainability Performance (SP) has three sub-constructs: Economic (E), Social (S), and Environmental (EN). The Economic sustainability performance has 6 items. The item "There is a reduction in the cost of purchasing materials in my firm" has a mean of 4.58 and a standard deviation of 1.438. Item "There is a reduction in cost for environmental mishaps in my firm" has a mean of 5.00 and a standard deviation of 1.595. Under the social sustainability performance, there were 5 items. The item "My firm has improved with regards to employees' occupational health and safety" has a mean of 4.80 and a standard deviation of 1.765. The item "My firm has improved in lowering the adverse impact of products and processes on the local community" has a mean of 5.07 and a standard deviation of 1.740. Environmental sustainability has five items. The item "My firm operates on the low discharge of noxious chemicals into the air and water" has a mean

of 4.87 and a standard deviation of 1.728. The item “My firm operates on the low discharge of noxious chemicals into the air and water” has a mean of 4.47 and a standard deviation of 1.655. The values indicate that managers somewhat agree with items of sustainability performance.

In addition, Table 4.2 also shows the descriptive statistics of Top Management Environmental Orientation which has 6 items. The item “The top management of my firm attaches importance to understanding and mastering environmental protection measures” has a mean of 6.16 and a standard deviation of 1.095. The item “The top management of my firm attaches importance to the impact of relevant environmental laws and regulations on the firm” has a mean of 6.21 and a standard deviation of 1.086. The item “The top management of my firm attaches importance to the adverse effects of the production and business activities on the environment” has a mean of 6.21 and a standard deviation of 1.103. The values indicate that managers somewhat agree with items of the variable.

Lastly, Table 4.2 presents the descriptive statistic of Competitive Intensity and has three items. The item “Our industry has a large number of competitors” has a mean of 4.56 and a standard deviation of 1.882. Item “Competitors in our industry are very competitive when it comes to sustainability issues” has a mean of 4.88 and a standard deviation of 1.44”. The values indicate that managers somewhat agree with items of competitive intensity.

4.6 Inferential Analysis

Inferential analysis is built on the basis of descriptive analysis (Kaur *et al.*, 2018). It is performed to apply the findings from a sample to the population from which it was taken (Blaikie, 2003).

4.6.1 Preliminary Inferential Analysis

4.6.1.1 Test for Normality

The study items' normality tests are displayed in this section. The normality test is a test used to determine whether or not the data is regularly distributed (Niati *et al.*, 2021). The method used in this study to test for the normality of the data is Kurtosis and Skewness. These assessments were made in this study to make sure that the items used were suitable. In undertaking a normality test, Kurtosis scores must be less than 8, and skewness values must not be greater than 3.

Table 4.3 Normality result of items.

Code	Item	Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	Std. Error
EP(M)1	My firm's key supplier/buyer requires that the firm should adopt sustainability practices.	-.597	.170	-.226	.338
EP(M)2	My firm's key supplier/buyer requires that the firm should adopt green logistics strategy.	-.092	.170	-.668	.338
EP(M)3	My firm would have lost its key supplier/buyer if it had not adopted sustainability practices.	-.044	.170	-.667	.338
EP(M)4	My firm would have lost its key supplier/buyer if it had not adopted a green logistics strategy.	-.320	.170	-.366	.338
EP(NM)1	Environmental regulations are established by the government for business activities (such as waste emissions, cleaner production, etc.)	-.359	.170	-1.036	.338
EP(NM)2	Regulations for resource conservation and resource-saving are regulated by the government.	-.173	.170	-1.020	.338
EP(NM)3	Environmental penalties are severe and impact my firm negatively.	-.621	.170	-.477	.338
EP(NM)4	The media monitors our business operation.	-1.235	.170	.899	.338
GLS1	My firm prefers the use of reusable and recyclable materials.	.172	.170	-.820	.338
GLS2	My firm promotes the use of eco-friendly materials for inner and outer packaging.	.179	.170	-.752	.338
GLS3	My firm uses sustainable transport methods to help cut CO2 emissions.	-.026	.170	-.603	.338
GLS4	My firm monitors and evaluates environmental regulations and practices.	-.253	.170	-.765	.338
GLS5	My firm ensures that environmental information is shared across the logistics network.	-.160	.170	-.865	.338
GLS6	My firm engages in training the employees in green logistics strategy.	.057	.170	-.717	.338
GLS7	My firm has set up green reward schemes.	.781	.170	1.738	.338

SP(E)1	There is a reduction in the cost of purchasing materials in my firm.	.107	.170	-.305	.338
SP(E)2	There is a reduction in the cost of energy consumption in my firm.	-.199	.170	-.738	.338
SP(E)3	There is a reduction in cost for treatment and discharge of waste in my firm.	-.651	.170	-.303	.338
SP(E)4	There is a reduction in cost for environmental mishaps in my firm.	-.270	.170	-.902	.338
SP(E)5	There is an average profit growth in the firm.	-.831	.170	.183	.338
SP(E)6	There is an average growth in market share in the firm.	-.367	.170	-.820	.338
SP(S)1	My firm has improved with regards to employees' occupational health and safety.	-.457	.170	-.855	.338
SP(S)2	My firm has improved in lowering the adverse impact of products and processes on the local community.	-.496	.170	-.834	.338
SP(S)3	My firm has strengthened its relationship with the community and stakeholders	-.394	.170	-.973	.338
SP(S)4	My firm actively communicates with its consumers about sustainability values.	-.156	.170	-.972	.338
SP(S)5	My firm has improved the living quality of surrounding communities.	-.515	.170	-.352	.338
SP(EN)1	My firm operates on low discharge of noxious chemicals into the air and water.	-.289	.170	-1.045	.338
SP(EN)2	My firm operates on less waste and recycling of materials during the manufacturing process.	-.481	.170	-1.070	.338
SP(EN)3	My firm increases the consumption of renewable energy and sustainable fuels.	-.248	.170	-.963	.338
SP(EN)4	My firm reduces the frequency of environmental mishaps.	-.163	.170	-1.132	.338
SP(EN)5	There is an enhancement in the firm's environmental state.	-.332	.170	-1.057	.338
TME01	The top management of my firm attaches importance to understanding and mastering environmental protection measures.	-.289	.170	-1.045	.338

TMEO2	The top management of my firm attaches importance to the impact of relevant environmental laws and regulations on the firm.	-.481	.170	-1.070	.338
TMEO3	The top management of my firm attaches importance to the adverse effects of the production and business activities on the environment	-.248	.170	-.963	.338
TMEO4	Top management usually satisfies requests for resources necessary for improving sustainability.	-.163	.170	-1.132	.338
TMEO5	Top management is supportive of efforts to improve sustainability initiatives.	-.332	.170	-1.057	.338
TMEO6	Top management considers sustainability an important part of firm's strategy.	-.289	.170	-1.045	.338
CI1	Our industry has a large number of competitors.	-.204	.170	-1.050	.338
CI2	Our customers expect more environmentally friendly products due to high competition.	-.083	.170	-1.081	.338
CI3	Competitors in our industry are very competitive when it comes to sustainability issues.	-.228	.170	-.516	.338

Source: Field Survey (2023)

Nevertheless, as can be observed in Table 4.3 above, every research item was eligible to be used for additional analysis. For example, the item "my firm's key supplier/buyer requires that the firm should adopt sustainability practices " has a skewness score of -0.597 and a kurtosis value of -0.226, indicating the item's suitability for further study. Table 4.2 above displays the remaining skewness and kurtosis values.

4.6.1.2 Common Method Bias Variance

Common method bias is a phenomenon generated by the measuring methods used in a study (Kock, 2021). It occurs when answers from study participants vary as a result of the questionnaire rather than the respondents' true characteristics, which is what the instrument is intended to reveal. Also, the common roots of method bias are the physical layout of the survey instrument and the respondents' generated views based on personal social and mental biases (Podsakoff *et al.*, 2012). One of the common methods to determine common method bias is Harman's single factor test. Harman's single factor test allows all items to be loaded in a common factor. For your data not to be affected by the common bias method,

the total variation should be less than 50% (Kock *et al.*, 2021). Hence if the total variation is more than 50%, a common bias method is present in the data.

To reduce the possibility of bias, the survey sent out in this study was carefully designed and to test for the common method bias, Harman's single factor test was carried out. The one factor accounted for is shown below as 33.826%, which means the study does not suffer common method bias variance.

4.6.2 Multicollinearity Test

Multicollinearity happens when there are numerous factors included in a multiple linear regression analysis that have a strong correlation (Shrestha, 2020). It is important to note that, some of the relevant study variables become statistically irrelevant due to multicollinearity. To identify the multicollinearity, an indicator termed Variance Inflation Factor (VIF) was employed (Shrestha, 2020).

The variance inflation factor is used to evaluate the extent to which the predicted regression coefficient's variance is inflated when the independent variables are associated (Shrestha, 2020). VIF is frequently used to measure the collinearity of the formative indicators (Hair *et al.*, 2019). As per Hair *et al.* (2019), VIF values higher than 5 show there is a problem with the collinearity of the formative indicators.

Table 4.4 Variance Inflation Factor (VIF)

ITEMS	VIF
CI1	2.510
CI2	2.357
CI3	1.193
EP(M)2	1.681
EP(M)3	2.082
EP(M)4	2.077
EP(NM)1	2.011
EP(NM)2	2.458
EP(NM)3	2.429
EP(NM)4	1.609
GLS1	1.000
GLS2	2.731
GLS3	2.279
GLS4	2.511
GLS5	2.389
GLS6	2.426
SP(E)2	2.568
SP(E)3	1.253
SP(E)4	3.719
SP(E)5	2.309
SP(E)6	3.126

SP(EN)1	2.125
SP(EN)2	3.233
SP(EN)3	4.192
SP(EN)4	4.035
SP(EN)5	4.230
SP(S)2	4.349
SP(S)3	3.644
SP(S)4	1.338
TME01	2.864
TME02	2.848
TME03	1.869
TME05	1.527

Source: Field Survey (2023)

Given this, results from Table 4.4 above reveals that all VIF values present are less than 5. Since all VIF values were below 5, multicollinearity was not present. Seven (EP(M)1, GLS7, SP(E)1, SP(S)1, SP(S)5, TME04, TME06) items of the variables were eliminated. These items were eliminated because they did not meet the threshold (refer to section 4.7.1.1)

4.6.3 Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis (EFA) is used to assess the relationship between the items with the measured variables that have been appropriately identified in the survey instruments (Mia *et al.*, 2019). It is also explained as a data-driven strategy used to identify the variable structure and evaluate its reliability as well as in the consolidation and organizing of numerous interconnected variables into a more manageable and valuable set of constructs (Radzi *et al.*, 2022). To verify the eligibility of the EFA, Kaiser–Meyer–Olkin (KMO) and Bartlett's Test of Sphericity are to be measured. KMO is a test used to evaluate how well the components explain one another in terms of the partial relationship among the variables (Analysis INN, 2020). On the other hand, the Bartlett's Test of Sphericity is used to rule out the possibility that the correlation matrix examined is an identity matrix (Analysis INN, 2020). For your variable to have an identity matrix, it means, your variables do not have a relationship and are not good candidates for factor analysis. For EFA to be considered valid, the general acceptability index is more than 0.6. Accordingly, the factor analysis must also have a significant value of Bartlett's Test of Sphericity less than 0.05 in order to be considered valid (Hoque and Awang, 2016).

Therefore, in this study, item correlation analysis was carried out before the exploratory factor analysis (EFA). Data from the factor analysis was extracted using Principal Component Analysis (PCA), and the data was rotated using Varimax. The PCA was

selected because it guaranteed less data loss and enabled the study to look into the foundational structure of the data (Nong *et al.*, 2019). The rotated component matrix was loaded individually. The result from the PCA as shown in Table 4.5 was used to calculate the KMO (Kaiser–Meyer–Olkin) test and Bartlett’s test of sphericity.

Table 4.5 Exploratory Factor Analysis

Code	Rotated Component Matrix							
	1	2	3	4	5	6	7	8
EP(M)1	.785							
EP(M)2	.775							
EP(M)3	.830							
EP(M)4	.754							
EP(NM)1							.702	
EP(NM)2							.754	
EP(NM)3							.576	
EP(NM)4							.661	
GLS1		.629						
GLS2		.733						
GLS3		.682						
GLS4		.749						
GLS5		.793						
GLS6		.749						
SP(E)1					.675			
SP(E)2					.682			
SP(E)3					.782			
SP(E)4					.590			
SP(E)5					.658			
SP(E)6					.556			
SP(S)1				.653				
SP(S)2				.594				

SP(S)3	.671	
SP(S)4	.606	
SP(S)5	.703	
SP(EN)1		.782
SP(EN)2		.589
SP(EN)3		.694
SP(EN)4		.650
SP(EN)5		.753
TME01	.659	
TME02	.733	
TME03	.739	
TME05	.713	
CI1		.733
CI2		.692
CI3		.710

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Source: Field Survey (2023)

4.6.3.1 Bartlett's Test of Sphericity and KMO Test

Bartlett's Test of Sphericity and KMO Test was done specifically to assess the validity of the factor and determine the partial relationships between the variables in this study.

Table 4.6 Bartlett's Test of Sphericity and KMO Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		
		.722
Bartlett's Test of Sphericity	Approx. Chi-Square	1352.351
	df	276
	Sig.	.000

Source: Field Survey (2023)

From Table 4.6 above, the KMO test value is .722 and Bartlett's Test of Sphericity is ($\chi^2 = 1352.351$, $df = 276$, $p \leq 0.000$), which verified the eligibility of the EFA. The value of the KMO and Bartlett's test is suitable because the result from the analysis was greater than 0.6 and less than 0.05 respectively (Hoque and Awang, 2016).

4.7 Evaluation of Partial Least Squares-SEM Results

In several areas of study, the partial least squares-structural equation modelling (PLS-SEM) method has emerged as an essential tool for testing conceptual models (Al-Emran *et al.*, 2019). The PLS-SEM is regarded as a variance-based SEM method that is frequently used when developing theories and making predictions about variables is the study goal (Hair *et al.*, 2014). PLS-SEM effectively handles complicated models as well as variables with individual and multi-item measures, all without encountering any identification issues. To wit, structural equation modeling (SEM) is a statistical method that has grown in popularity in research projects. Due to its capacity to model latent variables, account for many kinds of measurement errors, and evaluate complete hypotheses, has grown to be quite helpful for a variety of research tasks (Henseler *et al.*, 2016). SEM is a statistical approach for evaluating and examining a collection of hypotheses and correlations between numerous independent and dependent variables (Gefen *et al.*, 2000). Additionally, by analyzing the links between the independent and dependent variables, SEM enables researchers to respond to a group of interrelated research questions in an individual, systematic, and conduct a thorough assessment.

Likewise, using SEM, observed variables can also be measured directly while latent variables can be deduced from observed variables measured. A structural equation model is composed of measurement models and structural models. While a measurement model shows the connection between every observed variable and its latent variable, a structural model, displays the connections between latent variables. Hence, in this study, the PLS-SEM was used because it is possible to analyze both assessment measurement model as well as structural models simultaneously and able to handle small sample sizes better (Hair *et al.*, 2014). Specifically, it will help examine the relationship that exists between environmental pressure (market and non-market), green logistics strategy, sustainability performance (economic, social and environmental), top management environmental pressure, ownership origin and competitive intensity.

4.7.1 Assessment of Measurement Model

A model assessment produces statistical estimates of the measurement model (i.e., the correlations amongst the constructs and the indicators) (Al-Emran *et al.*, 2019). In this study, the methods used to assess the measurement model are; convergent validity and discriminant validity (Hair *et al.*, 2014).

4.7.1.1 Convergent Validity

Convergent validity is used to describe the degree to which a measure is linked positively with alternate measures of the same variable (Hair *et al.*, 2014). Item Loadings, Composite Reliability, Average Variance Extracted (AVE), RHO, and Cronbach's Alpha were used to examine the convergent validity. In the study, the Factor Loading and Composite Reliability are presented in Table 4.7 and Table 4.8.

Table 4.7 Factor Loadings

ITEMS CODE	CI	EP(M)	EP(NM)	GLS	SP(E)	SP(EN)	SP(S)	TME0
CI1	0.783							
CI2	0.715							
CI3	0.864							
EP(M)2		0.792						
EP(M)3		0.863						
EP(M)4		0.884						
EP(NM)1			0.831					
EP(NM)2			0.861					
EP(NM)3			0.863					
EP(NM)4			0.705					
GLS1				0.86				
GLS2				0.823				
GLS3				0.842				
GLS4				0.839				
GLS5				0.841				
GLS6				0.852				
SP(E)2					0.889			
SP(E)3					0.777			
SP(E)4					0.86			
SP(E)5					0.782			
SP(E)6					0.862			
SP(EN)1						0.906		
SP(EN)2						0.885		
SP(EN)3						0.907		
SP(EN)4						0.917		
SP(EN)5						0.889		
SP(S)2							0.826	
SP(S)3							0.867	
SP(S)4							0.792	
TME01								0.731
TME02								0.741

TMEO3	0.763
TMEO5	0.672

Source: Field Survey (2023)

From the results presented in Table 4.7 for factor loadings, seven (EP(M)1, GLS7, SP(E)1, SP(S)1, SP(S)5, TMEO4, TMEO6) items of the variables were eliminated from the model as a result of low factor loadings. The above items were eliminated because they could not meet the factor loading threshold of >0.7 (Hoda *et al.*, 2023). Again, to attain the necessary reliability, (Hair and Alamer, 2022) advise that all the items need a considerable load on their latent variables.

Table 4.8 Composite Reliability

Constructs	Cronbach's alpha	Composite reliability (RHO_a)	Composite reliability (RHO_c)	Average variance extracted (AVE)
Competitive Intensity	0.746	0.895	0.832	0.624
Market Environmental Pressure	0.805	0.823	0.884	0.718
Non-market Environmental Pressure	0.834	0.852	0.889	0.668
Green Logistics Strategy	0.919	0.92	0.936	0.711
Economic Sustainability Performance	0.891	0.899	0.92	0.697
Environmental Sustainability Performance	0.942	0.943	0.956	0.812
Social Sustainability Performance	0.771	0.775	0.868	0.687
Top Management Environmental Orientation	0.738	0.736	0.818	0.529

Source: Field Survey (2023)

The composite reliability ratings from Table 4.8, demonstrate internal consistency and explain the extent to which the variable indicators reflect the latent variable. All results were considerably higher than the threshold point of 0.70 (Sarstedt *et al.*, 2017). Also, the AVE assesses convergent reliability by calculating the variance of its indicators and the optimum AVE value recommended is ≥ 0.50 (Hair *et al.*, 2019). From Table 4.8, the AVE values are higher than 0.5 which makes it suitable for the study. In addition, when evaluating indication reliability, Cronbach's alpha should be higher than 0.7 (Hair *et al.*, 2019). Again, the results from Table 4.8 shown above reveals that all Cronbach's alpha values are more than 0.7 which makes it suitable for the study. Hence, the convergent validity of the model in the study is sufficiently proven.

4.7.1.2 Discriminant Validity

Following the convergent validity, the discriminant validity was estimated. An approach for demonstrating how different one variable is from others is discriminant validity. In terms of empirical criteria, discriminant validity is the degree to which a variable is different from another variable and reflects phenomena that are not represented by other variables in the model (Ravand and Baghaei, 2016). The measures used to evaluate discriminant validity are cross loadings, HTMT, and the Fornell-Larcker criterion.

According to Fornell and Larcker (1981), as stated in Hair *et al.* (2019) Fornell-Larcker Criterion states that the square root of the AVE of each latent variable must be higher than its latent variable correlations (LVC) in order to attain discriminant validity.

Table 4.9 Discriminant validity (Fornell-Larcker criterion)

Construct	CI	EP(M)	EP(NM)	GLS	SP(E)	SP (EN)	SP(S)	TME0
Competitive Intensity	0.79							
Market Environmental Pressure	0.511	0.847						
Non-market Environmental Pressure	0.586	0.59	0.818					
Green Logistics Strategy	0.656	0.702	0.686	0.843				
Economic Sustainability Performance	0.631	0.58	0.856	0.721	0.835			
Environmental Sustainability Performance	0.719	0.582	0.776	0.739	0.824	0.901		
Social Sustainability Performance	0.609	0.657	0.716	0.707	0.765	0.764	0.829	
Top Management Environmental Orientation	0.484	0.511	0.733	0.592	0.737	0.697	0.633	0.727

Source: Field Survey (2023)

Hence, from the results shown in Table 4.9, it is evident that the square root of the AVE of each latent variable is higher than its latent correlation in each column and row. However, the diagonal value for non-market environmental pressure to non-market environmental pressure is lesser than economic sustainability performance and non-market environmental

pressure in the row. Whilst in the column, economic sustainability to economic sustainability is lesser than economic sustainability and non-market environmental pressure. Also, top management environmental orientation to top management environmental is lesser than top management environmental orientation to non-market environmental pressure and economic sustainability performance.

The measurement model's discriminant validity can also be estimated using the cross-loadings of the measurement items. Cross loadings in research is a specific indicator that should have greater loadings on its own parent variable than on any other variable in the research (Khawaja, 2023). Thus, there are problems with discriminant validity when an item loads well on another variable compared to its parent variable.

Table 4.10 Cross Loadings

	CI	EP(M)	EP(NM)	GLS	SP(E)	SP(EN)	SP(S)	TMEO
CI1	0.783	0.282	0.451	0.368	0.492	0.613	0.438	0.33
CI2	0.715	0.274	0.373	0.277	0.448	0.5	0.356	0.262
CI3	0.864	0.538	0.528	0.716	0.548	0.6	0.577	0.475
EP(M)2	0.415	0.792	0.428	0.482	0.416	0.434	0.472	0.356
EP(M)3	0.464	0.863	0.528	0.627	0.558	0.527	0.561	0.48
EP(M)4	0.424	0.884	0.533	0.656	0.49	0.51	0.623	0.45
EP(NM)1	0.638	0.515	0.831	0.629	0.745	0.742	0.624	0.562
EP(NM)2	0.565	0.561	0.861	0.616	0.768	0.711	0.634	0.636
EP(NM)3	0.412	0.471	0.863	0.54	0.692	0.617	0.586	0.639
EP(NM)4	0.222	0.351	0.705	0.427	0.568	0.41	0.476	0.572
GLS1	0.516	0.607	0.539	0.86	0.562	0.57	0.59	0.466
GLS2	0.49	0.588	0.58	0.823	0.569	0.559	0.539	0.467
GLS3	0.565	0.623	0.508	0.842	0.586	0.587	0.529	0.502
GLS4	0.578	0.552	0.626	0.839	0.649	0.677	0.634	0.507
GLS5	0.597	0.572	0.596	0.841	0.618	0.665	0.663	0.533
GLS6	0.566	0.614	0.614	0.852	0.653	0.663	0.606	0.514
SP(E)2	0.61	0.519	0.758	0.65	0.889	0.761	0.682	0.672
SP(E)3	0.457	0.445	0.679	0.536	0.777	0.64	0.613	0.579
SP(E)4	0.551	0.511	0.763	0.649	0.86	0.737	0.682	0.589
SP(E)5	0.405	0.392	0.674	0.52	0.782	0.554	0.537	0.613
SP(E)6	0.587	0.539	0.697	0.639	0.862	0.726	0.667	0.628
SP(EN)1	0.61	0.453	0.725	0.653	0.753	0.906	0.651	0.586
SP(EN)2	0.63	0.501	0.683	0.654	0.716	0.885	0.753	0.603
SP(EN)3	0.674	0.598	0.712	0.668	0.762	0.907	0.689	0.623
SP(EN)4	0.694	0.563	0.722	0.701	0.745	0.917	0.706	0.65
SP(EN)5	0.625	0.501	0.653	0.648	0.735	0.889	0.641	0.676
SP(S)2	0.476	0.461	0.645	0.546	0.695	0.696	0.826	0.508
SP(S)3	0.598	0.57	0.694	0.621	0.751	0.72	0.867	0.649
SP(S)4	0.432	0.596	0.439	0.585	0.452	0.483	0.792	0.409
TMEO1	0.101	0.283	0.434	0.271	0.403	0.248	0.305	0.731
TMEO2	0.157	0.324	0.506	0.306	0.453	0.288	0.401	0.741

TMEO3	0.184	0.308	0.485	0.343	0.417	0.279	0.37	0.763
TMEO5	0.647	0.458	0.601	0.601	0.687	0.846	0.597	0.672

Source: Field Survey (2023)

Therefore, in the study, the maximum factor loadings for each specific indicator were found on their variable, as shown in Table 4.10 above, indicating that there are no problems with discriminant validity and that the measurement model is appropriate and adequate for structural modeling.

Furthermore, discriminant validity is used to evaluate or measure how many unrelated variables will be present. The Fornell-Larcker criterion and cross-loadings are typically employed to evaluate the discriminant validity of items (Sarstedt *et al.*, 2017). As a result of their limited efficacy in identifying discriminant validity issues, these approaches have lately come under scrutiny by Henseler *et al.* (2015), who also suggested an alternate strategy for evaluating relationships among variables using the Heterotrait-monotrait (HTMT) ratio. HTMT is defined as the geometric mean of the average relationships for the indicators assessing the same variables divided by the mean value of the item relationships across constructs (Hair *et al.*, 2019). High HTMT readings result in issues with discriminant validity.

Comparing the HTMT to a predetermined threshold is necessary when using it as a criterion. One can say that there is a lack of discriminant validity if the HTMT value is higher than this cutoff. A 0.85 criterion is recommended by some authors (Tabri and Elliott, 2012; Henseler *et al.*, 2015), however, Gold *et al.* (2001) and Rasoolimanesh (2022) disputed and suggested a value below 0.90 (Ab Hamid and Mohmad, 2017).

From Table 4.11 below, all the HTMT value shown falls between the threshold. Showing that, discriminant validity is satisfactory in the study.

Table 4.11 Heterotrait-Monotrait (HTMT)

	CI	EP(M)	EP(NM)	GLS	SP(E)	SP(EN)	SP(S)	TMEO
CI								
EP(M)	0.578							
EP(NM)	0.667	0.703						
GLS	0.67	0.808	0.771					
SP(E)	0.737	0.676	0.859	0.791				
SP(EN)	0.835	0.663	0.856	0.791	0.894			
SP(S)	0.736	0.823	0.884	0.835	0.819	0.896		
TMEO	0.444	0.588	0.876	0.616	0.812	0.665	0.736	
CI x EP(NM)	0.224	0.148	0.109	0.2	0.225	0.186	0.182	0.088

Source: Field Survey (2023)

Note: Competitive Intensity (CI), Market Environmental Pressure EP(M), Non-Market Environmental Pressure EP(NM), Green Logistics Strategy, Economic Sustainability Performance SP(E), Environmental Sustainability Performance SP(EN), Social Sustainability Performance SP(S), Top Management Environmental Orientation (TMEO)

4.7.1.3 Summary of the Measurement Model

In summary, the study measured the measurement model through convergent and discriminant validity. Under the convergent validity, the study measured Item loading, Composite Reliability, AVE, RHO, and Cronbach's Alpha. For factor loadings, seven (EP(M)1, GLS6, SP(E)1, SP(S)1, SP(S)5, TMEO4, TMEO6) items of the variables were eliminated from the model because they could not meet the factor loading threshold of >0.7 . Also, the AVE values from the analysis are higher than 0.5 which makes it suitable for the study. Furthermore, the analysis also reveals that all Cronbach's alpha values are more than 0.7.

Following the convergent validity, the discriminant validity was estimated. Cross Loadings, HTMT, and Fornell-Larcker Criterion were measured for discriminant validity. The cross loading showed discriminant validity. However, with Fornell-Lacker, the square root of AVE for non-market environmental pressure and top management environmental orientation did not show discriminant validity due to its extremely inadequate sensitivity (Henseler et al., 2015). Nonetheless, the HTMT value shown from the result falls under the threshold which is less than 0.90 (Ab Hamid and Mohmad, 2017). In line with Henseler et

al. (2015) who criticized Fornell-Lacker due to its low performance which led to the introduction of HTMT, this study has no problem with discriminant validity. Hence, the measurement model is adequate and appropriate for structural modeling.

4.8 Structural Model Analysis and Hypotheses Testing

After the measurement model's accuracy was examined, the researcher evaluated the structural model and tested the hypotheses.

4.8.1 Structural Model Evaluation and Predictive Relevance

To wit, the predicting abilities of the model and the correlation between the variables were looked at. To assess the structural models, criteria such as Structural Model Evaluation and Predictive Relevance, Coefficients of Determination (R^2) and Adjusted R^2 , Effect Size f^2 and Predictive Relevance (Q^2) will be considered.

4.8.2 Coefficients of Determination (R^2) and Adjusted R^2

Coefficients of Determination was originally defined as the degree to which the dependent variable is influenced by the independent variables (Chicco *et al.*, 2021). It is usually referred to as R^2 . As an indicator of the model's explanatory ability, the R^2 evaluates the variance, which is described by every endogenous variable (Hair *et al.*, 2019). R^2 values of 0.75, 0.50, and 0.25, respectively, might be regarded as significant, moderate (Hair *et al.*, 2019), and low. However, as per Hair *et al.* (2019), maximum values of the R^2 , which runs from 0 to 1, suggest a stronger explanatory power.

Table 4.12 Coefficients of Determination (R^2) and Adjusted R^2

	R-square	R-square adjusted
GLS	0.698	0.679
SP	0.771	0.765

Source: Field Survey (2023)

From Table 4.12 above, the value for green logistics strategy 0.698 represents 69.8%, the value for economic sustainability performance is 0.771 representing 77.1%. Therefore, the values from the analyses represent a significant coefficient determinant.

4.8.3 Effect Size f^2 , Predictive Relevance (Q^2)

A structural model variable may be impacted by a variety of other variables. The dependent variable may change if an external variable is removed. When an external variable is taken out of the model, the R-Square changes, which is known as the F-Square or f^2 (Hair *et al.*,

2019). The effect size f^2 is categorized into value less or equal to 0.8 as suggested by Cohen (1988) as stated in (Lakens, 2013).

Table 4.13, presents the result of the analysis which shows that the values of effect size shown falls within the threshold.

Table 4.13 Effect Size f^2

	CI	EP	EP(M)	EP(NM)	FIRM OWN ORIG	GLS	SP	TMEO
CI						0.133		
EP						0.037	0.697	
EP(M)						0.040		
EP(NM)						0.038		
FIRM OWN ORIG						0.006		
GLS							0.122	
SP								
TMEO						0.019		

Source: Field Survey (2023)

Calculating the Q^2 value is a different approach to evaluating how well the PLS path model predicts outcomes. This metric is based on a method known as blindfolding, which involves removing individual data points from a data matrix, replacing those points with the mean, and estimating the model's variables (Sarstedt *et al.*, 2014).

The predictive relevance metric Q -square determines if a model has predictive relevance (Hair *et al.*, 2019). The model has predictive relevance when the Q^2 is greater than 0 (Hair *et al.*, 2019). Specifically, Hair *et al.* (2019) further state that, The PLS-path model's minor, medium, and significant predictive importance are, respectively, represented by Q^2 values higher than 0, 0.25, and 0.50.

Thus, in the study, green logistics strategy has a Q^2 value of 0.632, sustainability performance has 0.756. This result shows that the model has an appropriate predictive value.

Table 4.14 Predictive Relevance (Q^2)

	Q^2 predict	RMSE	MAE
GLS	0.632	0.612	0.467
SP(E)	0.756	0.496	0.391

Source: Field Survey (2023)

4.8.4 Resampling Method

The resampling method is a method undertaken to make inferences about the population of interest (Sinharay, 2009). The Jackknife and Bootstrap resampling techniques are two of the most used method of resampling(Sinharay, 2009). In the context of statistical inference, the Jackknife method is employed to calculate the biases and standard error of a test statistic whiles bootstraps is a statistical method that estimates a sampling distribution of a model by sampling with replacement from the initial sample (Sinharay, 2009).

For this study, the bootstrapping resampling method was undertaken. This was because, in bootstrapping, with replacement, a large number of subsamples are taken from the original data (Hair *et al.*, 2014). In this manner, the researcher can gather a sizable number of the model which estimates typically 5,000 or more and can be used to calculate the standard error of each model variable (Hair *et al.*, 2014). Thus, bootstrapping was estimated at 10,000 in this study.

4.8.5 Hypothesis Testing

To determine whether or not the paths were supported, the study looked at the path coefficients and t-values for each hypothetical direct path.



Table 4.15 Hypothesis Table

Hypothesis	Path	Effect	T values	P value	Decision
H1	Environmental Pressure -> Green Logistics Strategy	-19.862	3.306	0.002	Not Supported
H1a	Market Environmental Pressure -> Green Logistics Strategy	9.508	3.127	0.002	Supported
H1b	Non-Market Environmental Pressure -> Green Logistics Strategy	13.264	3.123	0.002	Supported
H2	Green Logistics Strategy -> Sustainability Performance	0.271	3.968	0.000	Supported
H3	Environmental Pressure -> Sustainability Performance	0.637	10.501	0.000	Supported
H4a	Top Management Environmental Orientation x Environmental Pressure -> Green Logistics Strategy	0.069	1.324	0.186	Not Supported
H4b	Firm Ownership Origin x Non-market Environmental Pressure -> Green Logistics Strategy	0.012	0.104	0.917	Not Supported
H4c	Competitive Intensity x Environmental Pressure -> Green Logistics Strategy	0.056	0.975	0.330	Not Supported
H5	Environmental Pressure -> Green Logistics Strategy -> Sustainability Performance	-5.383	2.553	0.011	Not Supported
Control variables	Number of Employees -> Green Logistics Strategy	0.020	0.405	0.685	
	Number of Employees -> Sustainability Performance	-0.075	1.867	0.062	
	Number of Years -> Green Logistics Strategy	0.040	0.929	0.353	
	Number of Years -> Sustainability Performance	0.000	0.010	0.992	

Firm Income -> Green Logistics Strategy	-0.090	1.657	0.098
Firm Income-> Sustainability Performance	-0.017	0.409	0.683

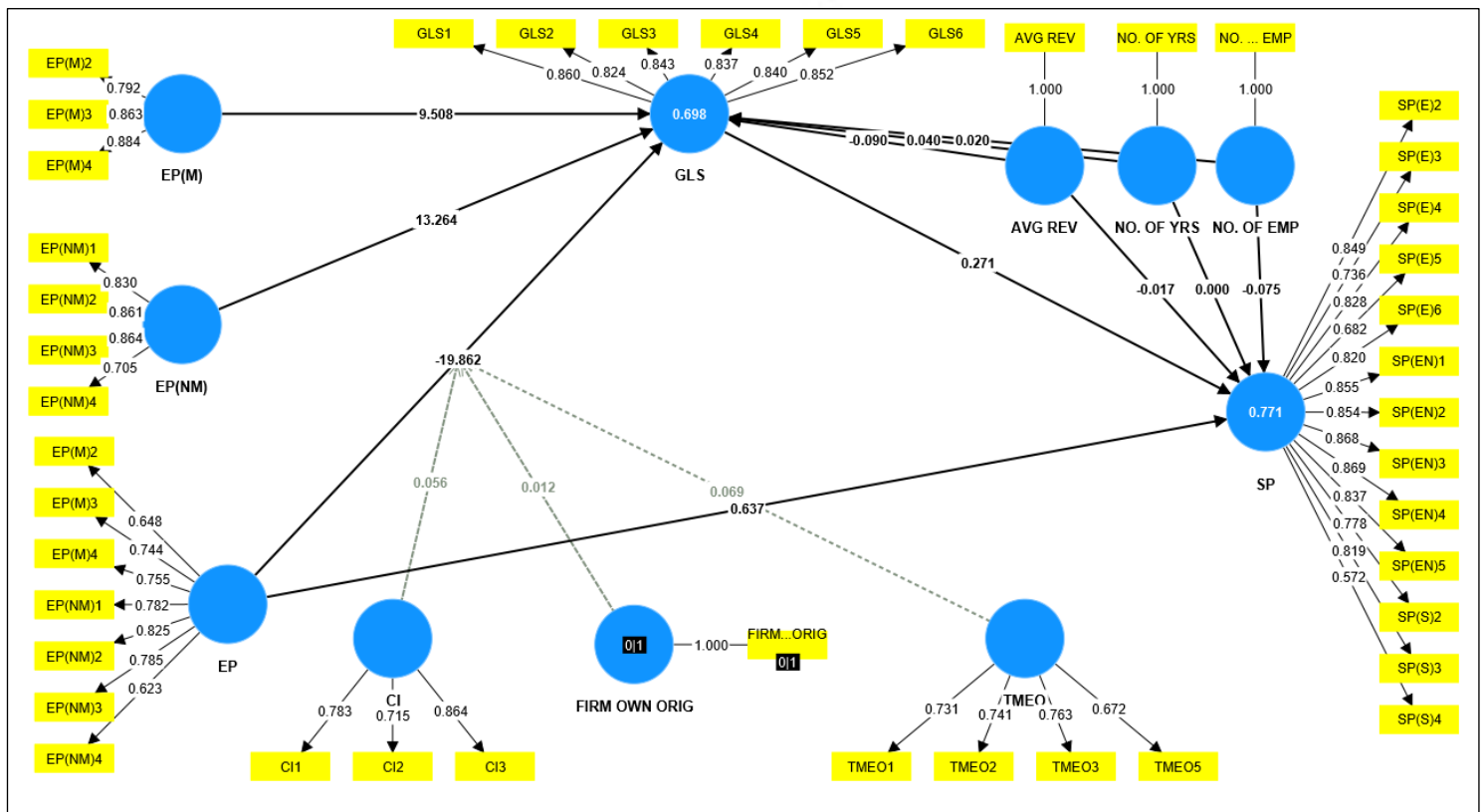
Source: Field Survey (2023)

The findings as shown in Table 4.13 reveals that the effect of environmental pressure on green logistics is negative but significant ($\beta = -19.869$; $t = 3.306$; $p=0.002$), which showed that hypothesis H1 was not supported. Again, the study reveals that the effect of market environmental pressure on green logistics strategy is positive and significant ($\beta = 9.508$; $t = 3.127$; $p = 0.002$), which showed that hypothesis H1a was supported. The effect of non-market environmental pressure on green logistics was also positive and significant ($\beta = 13.264$; $t = 3.123$; $p =0.002$). Thus, H1b was supported. Also, to examine the influence of green logistics strategy on sustainability performance, a direct effect was examined. The results showed that there was a positive and significant relationship ($\beta = 0.271$; $t=3.968$; $p =0.000$), meaning, hypothesis H2 was also supported. Likewise, to assess the influence of environmental pressure on sustainability performance, the result showed the effect was significant ($\beta = 0.637$; $t=10.501$; $p=0.000$), meaning, hypothesis H3 was not supported.

Also, the study aimed to examine the moderating effects of top management environmental orientation, ownership origin (developed or developing), and competitive intensity on both market and non-market environmental pressure on green logistics strategy. The results showed that top management environmental orientation moderating the positive relationship between environmental pressure and green logistics strategy was insignificant ($\beta = -0.069$; $t = 1.324$; $p=0.186$). Therefore, hypothesis H4a was not supported. Thus, hypothesis H4b was not supported. The moderating effect of firm ownership origin on the influence of environmental pressure and green logistics strategy was not substantial ($\beta = -0.012$; $t = 0.104$; $p=0.917$). Hence, hypothesis H4b was not supported. Also, the moderating role of competitive intensity on the relationship between environmental pressure and GLS was not significant ($\beta = 0.056$; $t = 0.975$; $p=0.330$). Thus, hypothesis H4c was supported. Furthermore, the result show that the mediating role of GLS in the relationship between market environmental pressure on sustainability performance is negative but significant ($\beta = -5.383$; $t = 2.553$; $p=0.011$). Hence, hypothesis H5 was not supported.

In terms of the control variables, it was found that firm size did not have a significant effect on green logistics strategy ($\beta = 0.020$; $t = 0.405$; $p=0.685$) neither did it on sustainability performance ($\beta = -0.075$; $t = 1.867$; $p=0.062$). Again, firm age did not affect green logistics strategy ($\beta = 0.040$; $t = 0.929$; $p=0.353$) and sustainability performance ($\beta = -0.000$; $t = 0.010$; $p = 0.992$). Regarding firm income and green logistics strategy, there was no significant effect ($\beta = -0.090$; $t = 1.675$; $p=0.098$). However, firm income had no significant effect on sustainability performance ($\beta = -0.017$; $t = 0.409$; $p=0.683$).

Figure 4.1 Structural Equation Modelling Result



4.9 Discussion of Findings

This section discusses the findings from the study. These discussions are done in line with the objectives of the study. The study's first objective was to examine the effect of environmental pressure on green logistics strategy and sustainability performance. The second objective is to find out the influence of green logistics strategy on sustainability performance. Lastly, the final objective was to ascertain the moderating role of competitive intensity, ownership origin, and top management environmental orientation on the relationship between environmental pressure, green logistics strategy, and sustainability performance.

4.9.1 Environmental pressure (market and non-market) on green logistics strategy.

The results from the analysis presented reveal that there is a negative but significant influence of environmental pressure on green logistics strategies ($\beta = -19.869$; $t = 3.306$; $p=0.002$). Also, there is a positive significant influence of market environmental pressure on green logistics strategies ($\beta = 9.508$; $t = 3.127$; $p = 0.002$). The results from the analysis also revealed that there is a positive significant influence non-market environmental pressure on green logistics strategies ($\beta = 13.264$; $t = 3.123$; $p = 0.002$). The result implies that environmental pressure whether market or non-market influences the integration and implementation of green logistics strategy. Implementing GLS has been significantly influenced by environmental pressure such as consumer demand for eco-friendly products, government and regulatory bodies. This is because, customers' awareness of ecofriendly issues grows, they value and prioritize goods that are manufactured through ecofriendly practices. Hence, in order to increase their competitiveness in the industry, manufacturing firms respond to this demand by adopting GLS (Walker *et al.*, 2008). Also, non-market environmental pressure such as government and regulatory bodies can influence the implementation of GLS in manufacturing firms if environmental legislation, benefits, and penalties linked to greenhouse gases, waste disposal, and energy usage are in place (Baah *et al.*, 2020). Also, the findings of the study do not support that of Chatzoudes and Chatzoglou (2022) that indicate that government regulation that is included in the non-market environmental pressure has an insignificant effect on GSCM which is also composed of GLS. Furthermore, the findings agree with the findings of Baah *et al.*, (2020) that regulatory stakeholder pressure affects the implementation of green logistics practices. Nonetheless, this study closely categorizes stakeholders into market and non-market, focus mainly on the environmental pressure, and look at how they influence the integration of GLS individually.

4.9.2 The relationship between green logistics strategy and sustainability performance.

The result reveals that green logistics strategy had a positive and significant influence on sustainability performance ($\beta = 0.308$; $t=4.425$; $p = 0.000$). Thus, the result implies that the implementation of GLS in manufacturing firms will affect the firms' sustainability performance. There is a significant influence because GLS aims to improve the overall sustainability performance of a firm while minimizing the environmental impact of logistical operations. A manufacturing firm that implements GLS will achieve

sustainability performance in the long run because, GLS includes energy conversation, transport route optimization and waste minimization (Wang *et al.*, 2018). Also, by implementing GLS like reverse logistics, firms can extract value from recyclables and increase the useful lifespan of products which will generate income for the firm.

Again, when manufacturing firms adopt GLS such as employing renewable energies, adopting environmentally friendly transportation strategies, and maximizing vehicle loads can all help to reduce carbon dioxide emissions which in tend help firms achieve environmental sustainability performance. GLS such as lowering automobile traffic and environmental pollution, can improve a company's rapport with the surrounding resident. Which will lead to better community attitudes and support (Zhang *et al.*, 2020).

This study agrees with the findings of a previous study conducted by Awan *et al.* (2017); Agyabeng-Mensah *et al.* (2020) that found that the implementation of green logistics practices and supply chain sustainability practices respectively impacts both social and environmental sustainability performance but also continue to reveal that, when GLS is adopted into firms' strategies, it influences the firm to achieve economic sustainability as well. These findings also support the study of Çankaya and Sezen (2019) which found that green supply chain management practices, composed of green logistics have a substantial positive influence on economic performance.

Also, the study is inconsistent with that found that green logistics management practice has a negative insignificant relationship with economic performance.

4.9.3 Environmental pressure on sustainability performance.

Also, there is a positive significant effect of environmental pressure on sustainability performance ($\beta = 0.620$; $t = 10.094$; $p = 0.000$). To begin with environmental pressure such as that from the government enact rules and regulations that require specific sustainable strategies and establish minimal benchmarks for economic, social, and environmental performance penalties (Rudyanto and Siregar, 2018). Hence, manufacturing firms must abide by these rules to stay out of trouble with the law and avoid paying fines or penalties. Again, studies such as Rudyanto and Siregar (2018) found that environmental and end users pressure affect the sustainability report of a firm as a whole. The result from the study suggests that when there is environmental pressure from stakeholders who are directly or indirectly affected by firms' operations, firms achieve sustainability performance.

4.9.4 The moderating role of competitive intensity, ownership origin, and top management environmental orientation on the relationship between environmental pressure and GLS.

The results from the analysis show that competitive intensity ($\beta = 0.084$; $t = 1.402$; $p=0.161$), firm ownership origin ($\beta = -0.028$; $t = 0.240$; $p=0.810$), and top management environmental orientation ($\beta = 0.044$; $t = 0.841$; $p = 0.400$) not moderate the relationship between environmental pressure and green logistics strategy. This suggests that environmental pressure has a direct influence on the adoption of GLS. However, the intervening effect of the competitive intensity, ownership origin, and top management environmental orientation do not play a moderating role in the relationship. Hence, how high or low the competitive intensity is in a manufacturing industry does not affect the relationship that exists between environmental pressure and GLS. Also, top management environmental orientation, whether developed or developing nations does not influence the relationship between environmental pressure and GLS. This is because, when a company's top management is predominantly influenced by external demands, such as environmentally friendly regulations, the environmental orientation of top management does not count. Also, manufacturing firms are forced to adopt environmental strategies regardless of top management's environmental orientation, which lessens the moderating influence of top management's orientation.

Furthermore, ownership origin did not moderate the relationship between environmental pressure. This is because, although citizens from developed nations are said to be environmentally conscious (Shetty and Bhat, 2022), situations when government rules relating to GLS are standardized and extend to all companies equitably, regardless of the firm owner's origin, GLS will be adopted.

The finding of the study is inconsistent with the study of Liu (2019) which found that there is a relationship between top management characteristics which includes their environmental orientation and green supply chain management. Furthermore, the findings of the study do not support the findings of the study of Chu *et al.* (2017) undertaken in Korea which revealed that the initiatives from top management play a significant role in a firm adopting several environmental practices which includes GLS.

Moreover, this study also does not support the study of Micheli *et al.* (2020) which found that under competitive intensity, regulatory pressure which comes from non-market environmental pressure influences the implementation of green practices which includes GLS.

4.9.5 The mediating role of GLS in the relationship between environmental pressure and sustainability performance.

The findings from the study reveal that the mediating role of GLS on the relationship between environmental pressure and sustainability performance is negative but significant ($\beta = 0.169$; $t = 4.320$; $p=0.000$).

This implies that, whenever a corporation is mainly driven by reducing expenses, it might not completely want to adopt higher-upfront-cost sustainability solutions. Certain green logistics strategies may necessitate trade-offs. For instance, making investments in electric automobiles, may cut pollution in the environment, however it may necessitate a considerable upfront financial commitment. Also, in some circumstances, businesses may embrace green logistics strategies primarily in reaction to environmental pressures, yet do so in a cost-effective manner. This implies that they pursue ecologically friendly measures, but they prioritize reducing expenses over overall sustainability. For instance, a firm could transition to more energy-efficient cars only to save money on fuel, with no true intention of lessening total environmental effect.

The finding of the study is inconsistent with the findings of Novitasari *et al.* (2023) which reveal that with external and internal pressure, GSCM which is composed of GLS mediates the relationship between cooperate social responsibility and firm performance. In addition, the study also does not supports the study of Chatzoudes and Chatzoglou (2022) which highlighted the significant mediating role of GSCM on the relationship between market and non-market relationship on firm performance.

CHAPTER FIVE

SUMMARY, CONCLUSION, IMPLICATIONS, AND RECOMMENDATION

5.0 Introduction

This chapter gives a summary of the study findings, builds a conclusion from the study findings, and suggest recommendation for the stakeholders involved. The goal of the study was to assess the effect of environmental pressure on green logistics strategy and sustainability performance with the moderating role of top management environmental orientation, firm ownership origin, and competitive intensity.

5.1 Summary of Findings

The study specifically aimed to examine the effect of environmental pressure on green logistics strategy and sustainability performance, to find out the influence of green logistics strategy on sustainability performance, to ascertain the moderating role of competitive intensity, ownership origin, and top management environmental orientation on the relationship between environmental pressure, green logistics strategy and lastly to find out the mediating role of green logistics strategy on the relationship between environmental pressure and sustainability performance.

5.1.1 The effect of environmental pressure on GLS.

This objective sought to examine the effect of environmental pressure on GLS. The findings from the analysis revealed that environmental pressure have a positive significant influence on the implementation of green logistics strategy. Also, market and non-market environmental pressure has a significant effect on GLS.

5.1.2 The influence of green logistics strategy on sustainability performance

This objective also sought to examine the influence of GLS on the dimension of sustainability performance. The study discovered that the implementation of GLS has a positive significant influence on sustainability performance. Hence, H2 which suggested that green logistics strategy has a positive significant relationship with sustainability performance was supported.

5.1.3 The effect of environmental pressure (market and non-market) on sustainability performance.

This objective sought to examine the effect of environmental pressure (market and non-market) on sustainability performance. The findings discovered that environmental pressure has a substantial influence on sustainability performance.

5.1.4 The moderating role of competitive intensity, ownership origin, and top management environmental orientation on the relationship between environmental pressure and green logistics strategy.

The objective of this study was to ascertain the moderating role of competitive intensity, ownership origin, and top management environmental orientation on the relationship between environmental pressure and green logistics strategy. The result of the study indicated the influence of competitive intensity on the relationship between environmental pressure and green logistics strategy was not significant. Hence, competitive intensity does not influence how environmental pressure affects the implementation of green logistics strategy.

Again, the outcome of the study revealed that firm ownership origin has an insignificant influence on the relationship that exists between environmental pressure on green logistic strategy. Thus, the firm owner's origin whether from a developed or developing nation does not influence how environmental pressure affects green logistics strategy.

Lastly, the top management's environmental orientation does not affect how environmental pressure influences green logistic strategy. Therefore, the environmental orientation of the top management of a firm does not influence the relationship between environmental pressure on GLS.

5.1.5 The mediating role of green logistics strategy on the relationship between environmental pressure and sustainability performance.

This objective was to find out the mediating role of GLS on the relationship between environmental pressure and sustainability performance. The finding from the analysis indicates that the mediating role of GLS on the relationship between environmental pressure and sustainability performance is significant and negative. Hence, GLS negatively mediates the relationship that exists between environmental pressure on sustainability performance.

5.2 Conclusion

The rise in need for green and sustainable practices in recent times have risen as a result of the environmentally related issues recorded globally. This has caused people or bodies such as customers, suppliers, government, regulatory bodies among others who have interest in the firm to exert environmental pressure on the firms to adopt ecofriendly strategy such as GLS. It is therefore expected that when the green logistics strategy is implemented, sustainability performance is achieved.

The results from the study have proven that in developing economies like Ghana when market and non-market environmental pressure is laid on manufacturing firms, they adopt GLS into their business strategies. Also, the findings strongly indicated that when GLS is adopted in manufacturing firms, the firms achieve sustainability performance as measured by economic, social, and environmental sustainability performance. In addition, the results revealed that when environmental pressure is exerted on manufacturing firms in developing economies like Ghana to adopt environmentally friendly strategies, the firms achieve sustainability performance.

Also concerning the moderating effect of top management environmental orientation, the study revealed that it had an insignificant effect on how environmental pressure influences GLS. Also, the findings concerning the moderating role of firm ownership origin offer a significant theoretical contribution to the manufacturing industry since its one of its kind in Ghana. The study concludes that in developing economies like Ghana, the origin (developing or developed) of the owner of the manufacturing firm does not affect how environmental pressure affects GLS. In addition, how intense the competition is in the industry is insignificant to the relationship between environmental pressure and GLS.

Furthermore, regarding the mediating role of GLS, the study concludes that the influence of environmental pressure on sustainability performance is negatively mediated by green logistics strategy. Hence, GLS negatively mediates the relationship between market and non-market environmental pressure and sustainability performance.

In all, the study concludes that when environmental pressure (market and non-market) is exerted on manufacturing firms to adopt ecological safety strategies, GLS is adopted. And when GLS is adopted by the firms, sustainability performance is achieved.

5.3 Implications

The researcher offers the following implications based on the key findings of the study to assist manufacturing industries (practical implications) in adopting green logistics strategy and achieving sustainability performance, policymakers with regards to making environmentally friendly policies to help achieve sustainability performance, and also theoretical implications in literature.

5.3.1 Managerial Implication

The study provides a useful managerial contribution that can help managers. The usefulness of GLS and environmental pressure in accomplishing sustainability performances is highlighted by this study's empirical data. First off, the study reveals that environmental pressure has a significant influence on GLS. Hence, this result shows that manufacturing firms that comply with environmental pressure to restructure their strategies to implement eco-friendly strategies will adopt GLS.

Secondly, the study discovered that there is a significant influence of GLS on sustainability performance. Thus, based on this result, any manufacturing firms that implement GLS will achieve sustainability performance. This finding also gives managers of manufacturing firms who want to implement GLS ample justification to present their suggestions and ideas to top management or the board of directors.

Furthermore, the study revealed that environmental pressure influences sustainability performance. Thus, based on the results of the study, manufacturing firms that comply with environmental pressure from stakeholders who are directly or indirectly affected by firm operations will achieve sustainability performance.

Lastly, the results show that GLS negatively mediates the relationship between environmental pressure and sustainability performance. Managers should assess and tackle operational issues that are inhibiting the implementation of GLS and resulting in enhanced sustainability performance. This could include evaluating the efficacy of their current GLS and finding opportunities for enhancement.

5.3.2 Policy Implication

The results from the findings give policymakers particularly the government and other environmental regulatory bodies the motivation they need to enforce already-existing regulations. First and foremost, the study suggests that governments, associations and

environmental regulatory bodies that form part of the environmental pressure should exert pressure on manufacturing firms to implement green logistics strategies.

Also, policymakers should develop policies that guide the logistics operations of manufacturing firms in Ghana. These policies are to compel manufacturing firms to restructure their logistics operations into green logistics. Government should set standards for sustainability strategies such as GLS to direct manufacturing firms toward sustainable actions in line with regional, national, or global goals, such as lowering greenhouse gas emissions or preserving natural resources.

Furthermore, based on the study, environmental pressure should be exerted on manufacturing firms to achieve sustainability performance. Hence, manufacturing firms will be compelled to develop environmentally friendly strategies such as GLS. Policymakers are to develop more environmentally focused national regulations from the sustainable development goal that will encourage and put pressure on Ghanaian manufacturing firms to achieve sustainability performance. Also, governments are aware of the dangers that unsustainable strategies may pose, including dangers to the ecosystem, overall wellness, and instability in society. These dangers can be reduced and government can improve resilience, and avert possible crises that can have a detrimental effect on the economy and society by enforcing regulations and encouraging sustainability.

The study also revealed that firm ownership origin does not moderate the relationship between environmental pressure and GLS. This could be because there are no environmental policies that compel owners from developed nations to adopt GLS thus, they settle into the business environment as it is.

5.3.3 Theoretical Implications

In multiple ways, this work offers theoretical implications. First of all, the study promotes the idea that environmental pressure is crucial because they affect the choices of firms that intend to have a significant effect on how the manufacturing firms in Ghana embrace and carry out green strategy and sustainability such as GLS. The study findings revealed that environmental pressure significantly influence the implementation of GLS. This study contributes to the stakeholder theory by showing that environmental pressure from the government, suppliers, customers, regulatory bodies, etc. influences the implementation of GLS.

In addition, this study offers empirical proof to support the findings of Agyabeng-Mensah *et al.* (2020) which reveals that the adoption of green logistics strategies is necessary for a firm to achieve sustainability performance. According to this study, and in line with institutional theory, green logistics strategy positively influences sustainability performance. The result of this study is consistent with other studies carried out in different parts of the world. This demonstrates that the institutional theory is not region-specific and could be used to accomplish the triple bottom-line sustainability performance objectives everywhere in the world.

Also, examining the moderating effect of firm ownership origin on the relationship between environmental pressure on GLS from a Ghanaian viewpoint, this study adds to the body of knowledge. The findings revealed that firm ownership origin has no significant influence on the relationship between environmental pressure and GLS when viewed from the lens of upper echelon theory. This discovery from this study expands the areas in which upper echelon theory can be used. Again, by examining the moderating effect of competitive intensity between environmental pressure and GLS. Previous studies (Khaksar *et al.*, 2016) have focused on how green practices such as GLS and stakeholder pressure has influenced competitive advantage. However, this study sought to add knowledge to the gap in literature by examining how the relationship between environmental pressure and GLS is influenced by competitive intensity. The study revealed that competitive intensity in the manufacturing industry insignificantly effects how environmental pressure affects green logistics strategy. The study was undertaken through the institutional pressure theory.

Lastly, the study adds to the body of knowledge by examining the role of GLS in mediating the relationship between environmental pressure and sustainability performance. The existing body of literature has concentrated on the mediating effect of GLS on the association between environmental pressure and just financial performance (Baah *et al.*, 2020) rather than sustainability performance. This research instead focuses on the ways that GLS affects the interactions between environmental pressure and sustainability performance. According to this study, GLS negatively mediates the association between environmental pressure and sustainability performance. This offers a comprehensive understanding of the significance that GLS play in helping firms accomplish their Sustainable Development Goals through all three dimensions. Also, this contributes to institutional theory by showing that GLS mediates the relationship between market and non-market pressure.

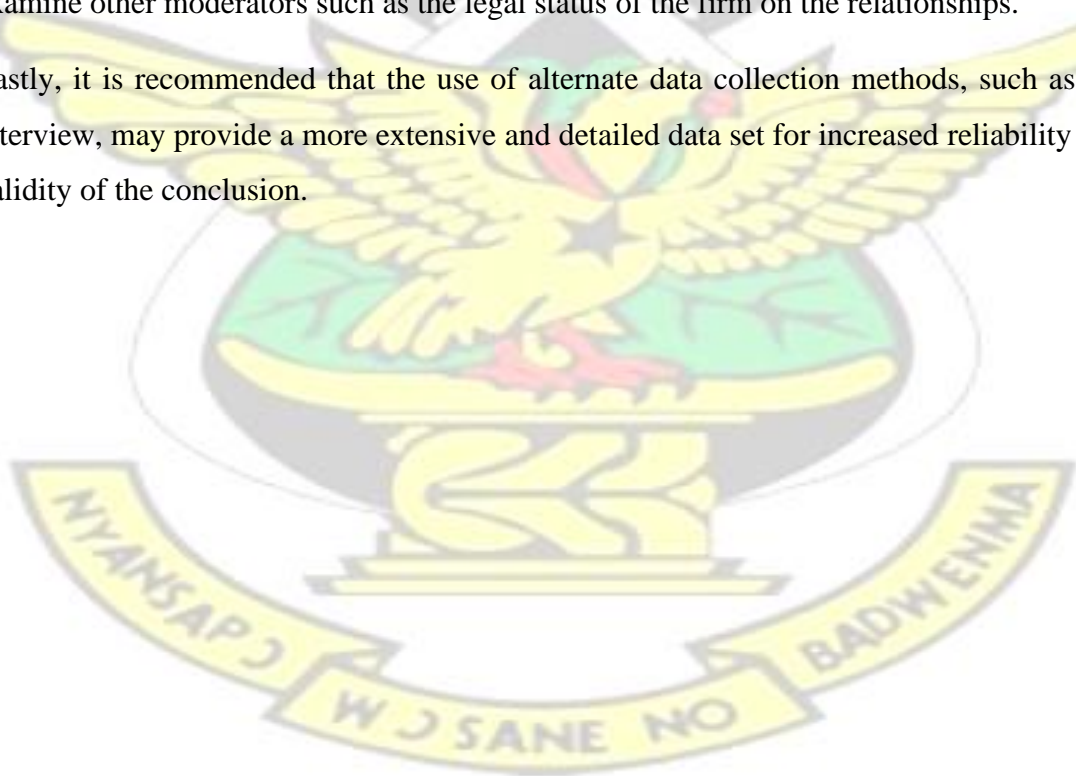
5.4 Recommendations for Further Research

Even though the study provides useful contributions to green logistics strategy and sustainability performance, this study has several limitations that may serve as an inspiration needed to conduct further studies.

To begin with, because the sample of the study was primarily composed of manufacturing industries in Ghana, the generalization of the findings is somewhat challenging. Thus, future research can be expanded to other developing nations, particularly those in Africa. Therefore, a longitudinal study could also be undertaken to aid in the generalization of the research findings. Also, the study can be conducted in other industries since the current study focuses on manufacturing firms.

In addition, since top management's environmental orientation and competitive intensity could not play a moderating effect on the relationship between market and non-market environmental pressure, they can be used in further studies as moderators between green logistics strategy and sustainability performance or as mediators. Also, further research can examine other moderators such as the legal status of the firm on the relationships.

Lastly, it is recommended that the use of alternate data collection methods, such as the interview, may provide a more extensive and detailed data set for increased reliability and validity of the conclusion.



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APPENDIX

SURVEY QUESTIONNAIRE

My name is OLIVIA ELLISON, a postgraduate student at the Kwame Nkrumah University of Science and Technology, Kumasi, Department of Supply Chain and Information Systems. This survey instrument has been designed to enable me carry out my research on the topic: **“ENVIRONMENTAL PRESSURE, GREEN LOGISTICS STRATEGY AND SUSTAINABILITY PERFORMANCE: THE MODERATING ROLES OF OWNERSHIP ORIGIN, TOP MANAGEMENT ENVIRONMENTAL ORIENTATION AND COMPETITIVE INTENSITY”**. Any information provided will be used for academic purposes ONLY. There are no risks associated with your participation, and your responses will remain confidential and anonymous.

SECTION A: RESPONDENT’S BIOGRAPHY AND COMPANY PROFILE.

When completing this questionnaire, please tick [√] in the applicable box or provide an answer as applicable.

1. Gender: ☐ Male ☐ Female
2. Educational Background:
☐ No formal education ☐ Basic/Primary ☐ Secondary ☐ Bachelor’s Degree
☐ Master’s Degree ☐ Ph.D.
3. Number of employees in the firm:
☐ Less than 6 employees ☐ 6-9 employees ☐ 10-29 employees
☐ 30-50 employees ☐ More than 50 employees
4. Number of years the firm has been in operation:
☐ Less than 1 year ☐ 1-5 years ☐ 6-10 years
☐ 11-15 years ☐ 16-20 years ☐ 21 years & above
5. Firm’s ownership type:
☐ Sole proprietorship ☐ Partnership ☐ Limited Liability Company
6. Type of Manufacturing Firm

Electronics ☐ Food, Water and Beverages ☐ Chemicals ☐

Oil and Gas ☐ Clothing, Cosmetics ☐ Cleaning agents ☐

Artisan works (Wood, Rubber, Metal) ☐ Oil and Gas ☐

Drugs and Medicines [] Others [Please specify]

7. Please indicate the average revenue of the company in Ghana Cedis (GHC) per year

Less than or equal to 10,000 []; 10,001-50,000 []; 50,001-100,000 [];

100,001-150,000 []; 150,001-200,000 []; 200,001-500,000 []; Above 500,000 []

8. Firm's ownership origin.

[] Developing country

[] Developed country

9. Please indicate your position in relation to management.

[] Top level

[] Middle level

[] Low level

SECTION B: ENVIRONMENTAL PRESSURE (Source: Vidal et al., 2022; Song et al., 2019; Shi and Tsai, 2022)

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 7, using the following scale:

1 = Strongly Disagree	2 = Disagree	3 = Somewhat Disagree	4 = Indifferent/Not Sure
5 = Somewhat Agree	6 = Agree	7 = Strongly Agree	

Item	Statement	1	2	3	4	5	6	7
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Market Environmental Pressure (MEP)

MEP10 My firm's key supplier/buyer requires that the firm should adopt sustainability practices.

MEP11 My firm's key supplier/buyer requires that the firm should adopt green logistics strategy.

MEP12 My firm would have lost its key supplier/buyer if it had not adopted sustainability practices.

MEP13 My firm would have lost its key supplier/buyer if it had not adopted green logistics strategy.

Non-market Environmental Pressure (NEP)

NEP14 Environmental regulations are established by the government for business activities (such as waste emissions, cleaner production, etc.)

NEP15 Regulations for resource conservation and resource-saving are regulated by the government.

- NEP16 Environmental penalties are severe and impact my firm negatively.
- NEP17 The media monitors our business operation.

SECTION C: GREEN LOGISTICS STRATEGY (Source: Baah, Jin, and Tang, 2019)

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 7 using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Somewhat Disagree 4 = Indifferent/Not Sure

5 = Somewhat Agree 6 = Agree 7 = Strongly Agree

Item	Statement	1	2	3	4	5	6	7
GLS18	My firm prefers the use of reusable and recyclable materials.							
GLS20	My firm promotes the use of eco-friendly materials for inner and outer packaging.							
GLS21	My firm uses sustainable transport methods to help cut CO2 emissions.							
GLS22	My firm monitors and evaluates environmental regulations and practices.							
GLS23	My firm ensures that, environmental information is shared across the logistics network.							
GLS24	My firm engages in training the employees in green logistics strategy.							
GLS25	My firm has setup green reward schemes.							

SECTION D: SUSTAINABILITY PERFORMANCE (Source: Zaid, Jaaron, and Talib Bon 2018; Raza, et al., 2022; Çankaya and Sezen, 2018)

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 7, using the following scale:

*1 = Strongly Disagree
Indifferent/Not Sure*

2 = Disagree

3 = Somewhat Disagree

4 =

5 = Somewhat Agree

6 = Agree

7 = Strongly Agree

Item	Statement	1	2	3	4	5	6	7
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Economic (Ec)

Ec26 There is a reduction in the cost of purchasing materials in my firm.

Ec27 There is a reduction in the cost of energy consumption in my firm.

Ec28 There is a reduction in cost for treatment and discharge of waste in my firm.

Ec29 There is a reduction in cost for environmental mishaps in my firm.

Ec30 There is an average profit growth in the firm.

Ec31 There is an average growth in market share in the firm.

Social (S)

S32 My firm has improved with regards to employees' occupational health and safety.

S33 My firm has improved in lowering the adverse impact of products and processes on the local community.

S34 My firm has strengthened its relationship with the community and stakeholders

S35 My firm actively communicates with its consumers about sustainability values.

S36 My firm has improved the living quality of surrounding communities.

Environmental (E)

E37 My firm operates on low discharge of noxious chemicals into the air and water.

- E38 My firm operates on less waste and recycling of materials during the manufacturing process.
- E39 My firm increases the consumption of renewable energy and sustainable fuels.
- E40 My firm reduces the frequency of environmental mishaps.
- E41 There is an enhancement in the firm's environmental state.

SECTION E: TOP MANAGEMENT ENVIRONMENTAL ORIENTATION

(Source: Cao and Chen 2018; Kitsis and Chen, 2021)

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 7 using the following scale:

- 1 = Strongly Disagree* *2 = Disagree* *3 = Somewhat Disagree* *4 = Indifferent/Not Sure*
- 5 = Somewhat Agree* *6 = Agree* *7 = Strongly Agree*

Item	Statement	1	2	3	4	5	6	7
TMEO42	The top management of my firm attaches importance to understanding and mastering environmental protection measures.							
TMEO43	The top management of my firm attaches importance to the impact of relevant environmental laws and regulations on the firm.							
TMEO44	The top management of my firm attaches importance to the adverse effects of the production and business activities on the environment							
TMEO45	Top management usually satisfies requests for resources necessary for improving sustainability.							
TMEO46	Top management is supportive of efforts to improve sustainability initiatives.							
TMEO47	Top management considers sustainability an important part of firm's strategy.							

F: COMPETITIVE INTENSITY(Source: Taherdangkoo, Mona and Ghasemi, 2018)

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 7 using the following scale:

1 = Strongly Disagree 2 = Disagree 3 = Somewhat Disagree 4 = Indifferent/Not Sure
5 = Somewhat Agree 6 = Agree 7 = Strongly Agree

Item	Statement	1	2	3	4	5	6	7
CI48	Our industry has a large number of competitors.							
CI49	Our customers expect more environmentally friendly products due to high competition.							
CI50	Competitors in our industry are very competitive when it comes to sustainability issues.							

Thank you for participating in the survey.

