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The Impact of Logistics Integration on Supply Chain Performance: The Moderating Role of Information Sharing

Gabriel Asare
https://orcid.org/0009-0005-0806-9015

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Abstract

Purpose: The study aims to assess the influence of logistics integration on supply chain performance, as well as the function of information sharing plays in that connection among supply chain partners in a vital section of Ghana's economy (the Energy Sector).

Methodology: The study employed quantitative approach and adopted the explanatory research designs in the investigation. The research population targets senior management staff of energy firms operating within the Greater Accra Region. The study used convenience sampling approach to select a total of 111 employees from the population. Structured survey questionnaire was used as a data collection instrument to gather primary data from respondents. Data technique used were descriptive and inferential analysis and structural equation modelling using IBM SPSS (version 26) and Amos version 23.

Findings: The study found that: a) logistics integration has a significant and positive effect on supply chain performance; b) information sharing correlates positively and significantly with supply chain performance; c) information sharing does not have any influence of the relationship between supply chain performance and logistics integration.

Unique Contribution to Theory, Policy, and Practice: The study recommends that, supply chain managers to utilize technology as part of the strategic objectives to attain supply chain performance across their operations and lastly, managers are encouraged to promote successful information flow across the chain using design for disassembly principles, source effective communication, and supplier need-to-know policies. The study concludes that future studies are urged to create a research model that takes into account the comprehensive definition of sustainability, including its economic, social, and environmental elements, in order to fill in gaps in the literature and fill them. Future research is also urged to take into account how industrial innovation mediates the link between sustainability and other important outcome variables including sustainability performance, cost performance, customer happiness, and environmental performance.

Keywords: *Logistics Integration, Supply Chain, Performance, Information Sharing*

1.0 INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Globalization has fundamentally altered the corporate environment. Because it is frequently impossible for a single company to get all the resources necessary to face quickly changing business environments, a rising number of businesses have sought to create strong ties with their business partners in reaction to this transition (Prajogo and Olhager, 2012). To capitalize on economies of scale, several businesses have formed strategic partnerships with members of their supply chain (Li, 2020). They have supply chain members who share information, knowledge, resources, and competencies to improve the overall competitiveness of the supply chain (Batarfi & Attia, 2021).

Integration of supply chain systems is critical for boosting performance (Abdallah *et al.*, 2021). Supply chain management organizes company activities such as procurement, manufacturing, transportation, and distribution to ensure that the finished product gets delivered to the customer (Wu *et al.*, 2022). According to (Helo and Shamsuzzoha, 2020), supply chain management (SCM) has a substantial impact on corporate performance since it covers the flow of information, resources, products, and money inside and across the firm (Zacharias & Boopathy, 2018). Companies tend to integrate their systems to facilitate the flow of information, materials, and other resources, thereby gaining a competitive advantage for the firm as well as across suppliers, customers, and other business partners, thus creating value by lowering costs and increasing customer satisfaction. Supply logistics integration is described as the establishment of linkages between enterprises and suppliers to improve the movement of materials, resulting in a smoother manufacturing process (Prajogo and Olhager, 2012). Integrating firm logistics operations between supplier and buyer necessitates integrating both parties' information and coordinating their actions to achieve high visibility and information flow between the two parties (Bawono et al., 2016).

Managers are starting to recognize the importance of logistics and supply chain management (SCM) in better managing commercial transactions as organizations attempt to provide greater value to their consumers. A supply chain must match supply and demand to be effective. To guarantee uninterrupted movement at each of the numerous buyer-supplier interfaces in a supply chain network, supply chain partners must be integrated. Several previous studies examined various aspects of SCM on performance and noted the importance of supply chain integration, which entails efficient information management and close organizational collaboration among supply chain partners (‘The Handbook of Market Intelligence’, 2012; ‘Market Intelligence for Supply Chain Management’, 2015; Pettit, Croxton and Fiksel, 2019).

(Pettit, Croxton and Fiksel, 2019) SCM is defined as the strategic and systemic coordination of a company's business operations, policies, and procedures, as well as between companies within the SC, to improve the long-term performance of the SC as a whole and the firms involved at all levels.

SCM is defined by (Chrisandina *et al.*, 2022a) as the integration of customers, manufacturers, and suppliers to increase a company's flexibility and responsiveness. It is vital to highlight that for logistics integration to succeed, relevant information must be shared across the supply chain. This will improve supply chain operations and overall chain performance, resulting in value creation.

Based on the above, the study aims to assess the influence of logistics integration on supply chain performance, as well as the function of information sharing plays in that connection. This, according to the study, will expand and improve collaborative ties among supply chain partners in a vital section of Ghana's economy (the Energy Sector).

1.2 STATEMENT OF THE PROBLEM

Several previous studies examined various aspects of SCM on performance and noted the importance of supply chain integration, which entails efficient information management and close organizational collaboration among supply chain partners (Bueno *et al.*, 2010; Cao and Zhang, 2011; Haar, O'Kane and Cunningham, 2022) Prior study, however, has shown inconsistencies in the findings on the relationship between integration and performance. While some research suggests that effective integration may result in more efficient logistics operations (Chan *et al.*, 2016; Tseng *et al.*, 2022), other empirical data contradicts this (Swink et al., 2007). This raises concerns regarding the practical feasibility and value of an integrated supply chain. These contradictions may be due to the various predicted variables used in the various research (firm performance, competitive advantage, supply chain resilience)

Though the impact of logistics integration on supply chain performance is not lost on researchers, there seem to be varying degrees of outcomes in various research works carried out on the study's constructs. The work of (Batarfi & Attia, 2021) revealed that the results of linear regression analysis support the hypothesis that logistics integration has a positive effect on supply chain performance. Again, the results (Naway and Rahmat, 2019), showed that logistic integration did not correlate positively with supply chain performance.

Aside from these contradictions, very few articles can be found on the study's constructs. Even this does not take into account the role of information sharing in the correlations between logistics integration and supply chain performance. The works of (Bueno *et al.*, 2010; Haar, O'Kane and Cunningham, 2022), clearly indicated the role of knowledge or information sharing in logistics integration initiatives. For the above reasons, the research seeks to investigate the relationship between the study's variables logistics integration and supply chain performance, as it pertains to Ghana's energy sector. The researcher believes that adopting efficient logistics approaches to supply chain operations, there would be a significant and positive impact on the performance of the supply chain. Secondly, the researcher believes that the introduction of knowledge or information sharing will greatly influence this relationship. These reasons, coupled with the above-highlighted contradictions make a strong case for further studies in the research area. While the

research focuses on the energy sector in Ghana, the researcher hopes to reveal significant outcomes that can greatly streamline and impact positively the supply chain operations in the sector.

1.3 OBJECTIVES OF THE STUDY

The main objective of this study is to examine the moderating role of information sharing in the relationship between logistics integration and supply chain performance. Specifically, the research seeks to achieve the following objectives.

1. To examine the effect of logistics integration and supply chain performance.
2. To examine the effect of information sharing on Supply chain Performance.
3. To examine the moderating role of information sharing on the relationship between logistics integration and supply chain performance.

1.4 RESEARCH QUESTIONS

The study, therefore, asks the following questions

1. What effect has logistics integration and supply chain performance had?
2. What effect does information sharing have on supply chain performance?
3. What is the moderating role of information sharing in logistics integration and supply chain performance?

1.5 SIGNIFICANCE OF THE STUDY

The research is important for major stakeholders such as organizations, the economy, and academia. The research adds to the body of knowledge on logistics integration and supply chain performance by giving theoretical insights and empirical data. Again, the study fills gaps in the literature by concentrating on information sharing as a mediator between supplier relationship management and competitive advantage.

This study creates awareness of the need to develop and integrate efficient logistics practices within the supply chain to improve the overall supply chain performance**.** Improved logistics integration could result in favourable terms and conditions for the buying firm within the supply chain. Improved integrated logistics for the government would increase collaborative advantage, which might boost the firm's total corporate performance. This may decrease waste, alleviate environmental problems, and boost efficiency. Improving company performance may result in more profit, which may improve the government's tax returns.

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents a review of literature relevant to the study. It is structured into four main sections: conceptual review, theoretical framework, empirical review, and conceptual framework.

2.2 CONCEPTUAL REVIEW

Conceptual review is a methodology wherein research is conducted by observing and analysing definitions already presented information on a given topic. The concepts reviewed are logistics integration, information sharing and supply chain performance**.**

2.2.1 Logistics Integration

Iovan, (2017), defined Logistics integration as a strategic management aspect that oversees managing the acquisition, movement, and storage of raw materials, semi-finished goods inventory, finished goods inventory, and accompanying information in an organization and its marketing channels to meet customer expectations and achieve company profit targets. According to Fernandes et al., (2014) stronger logistics integration may lead to improved corporate operating performance. As a result, logistics necessitates the integrated management of numerous current distribution processes, ranging from activities involving the physical movement of raw materials to activities involving the transfer of completed items from the manufacturing site to the consumer Bueno et al., (2010). Sun et al., (2022) investigated the link between logistic integration and the speed of product delivery. The influence of logistic integration on the speed of product distribution yields the same findings, indicating a positive and substantial association between logistical integration and the speed of goods distribution.

The degree to which a client business strategically engages with its supply chain to manage intra and inter-organization operations is characterized as logistics integration (Ali *et al.*, 2022). Firms put a high amount of strategic significance on logistics integration in a network-based business environment (Hussain *et al.*, 2022). According to Lim et al., (2017) logistics integration is now an umbrella phrase that incorporates a broad variety of inter-functional operations between the logistics and marketing departments, as well as the IT department. Highly integrated logistics systems include dynamically coordinated business activities both within and outside of organizational boundaries Naway & Rahmat, (2019). Logistics integration is a collaborative and expanded network of the supply chain that provides integrated services as well as internal and external resources (Chrisandina et al., 2022).

Based on the above definitions, the researcher proposes a definition for logistics integration. Logistics integration is a strategic initiative, aimed at consolidating all logistical operations, (movement, and storage of raw materials, semi-finished goods inventory, finished goods and inventory), through an organization’s channels, to meet customer expectations and achieve company profit targets. (researcher’s construct, 2022).

2.2.2 Supply Chain Performance

According to Alarcón et al. (2021), SCP refers to the strategic and systemic coordination of a company's business operations, policies, and procedures, as well as between businesses within the

SC, to enhance the long-term performance of the whole SC and the firms engaged at all levels. Chrisandina et al. (2022) define SCP as the integration of consumers, manufacturers, and suppliers to improve a company's flexibility and responsiveness. In consonance with the above definitions, Ahi & Searcy, (2013) defines the Supply Chain Performance (SCP) concept as one that is aimed at integrating economic, environmental and social considerations with inter-organisational business systems to efficiently and effectively manage the material, information, and capital flows involved in the different levels of the SC to improve the profitability, competitiveness and resilience of the organisation.

Further, the process of creating, delivering, storing, distributing, and selling items to satisfy demand is referred to as supply chain performance (Bilgihan *et al.*, 2011). The supply chain encompasses all of the procedures and activities involved in getting the product to end users.

In recent years, the business sector has recognized sustainability as a major axis of operations growth. The supply chain sustainability strategy is the theoretical-practical centre axis, with management serving as the nucleus for its formulation and application (Ashby et al., 2012). Authors such as Ahi & Searcy, (2013) noted the presence of twelve definitions with variety in their conception and development axes. According to the conclusions of these writers, the definitions demonstrate the inclusion of the goal of sustainability in the company's actions. The many definitions provide various analytical methodologies, ranging from strategic considerations to economic components. Based on the above definitions, the researcher propounds this definition. According to the researcher, (2022), supply chain performance is the strategic coordination of operations, policies, and procedures, to enhance long-term performance.

2.2.4 Information Sharing

There are two components to information sharing: information sharing support systems and the information content (Rachuri et al., 2008), Previous study has shown that comprehending information sharing necessitates distinguishing between information sharing support systems and the information content (Hassanien Serror *et al.*, 2008) According to (Kaza and Chen, 2008) many businesses overpay for hardware and software information sharing support systems while overlooking the importance of focusing on other factors such as information flow and content. According to (Arefin, Hoque and Bao, 2015) the difference in organizational effectiveness is influenced by how information is delivered. High-performing firms, for example, employ information technology and systems to efficiently communicate strategic and operational information (Ben-Daya, Hassini and Bahroun, 2017). As a result, to maximize their operations, firms must examine their information technology investments and share critical information across departments (Bilgihan *et al.*, 2011). This kind of information exchange is an internal integrative process inside a firm that merges several roles and helps organizations improve their absorptive ability to acquire, digest, and transfer knowledge (Arefin, Hoque and Bao, 2015) This data also enables businesses to connect internal and external knowledge sources by increasing information

flow and enabling effective data retrieval (Kaza and Chen, 2008) Furthermore, these tactics increase the value of knowledge, whether it comes from inside or beyond the firm's walls (Rachuri *et al.,* 2008).

2.3 THEORETICAL REVIEW

This section reviews the theory that underpins the study, (the dynamic capability theory and resource dependency theory).

2.3.1 The Dynamic Capability Theory

Dynamic capacity, according to Chien and Tsai (2012), is an organization's capacity to actively modify its resource base. An organization's capacity to react to outside events should be sufficient and prompt. This necessitates the adoption of a variety of strategies that will draw on and effectively utilize the organization's wide range of skills. The company will be able to integrate, grow, and profit from its supply chain. It is important that for logistics integration to impact supply chain performance significantly, an organization's unique resource is applied to the logistics integration initiative. Organizational structures, cultural norms, marketing strategies, and customer preferences are all evolving. Companies should therefore be able to quickly respond to these advances. According to the dynamic capacity hypothesis, only those organizations will be able to break even in today's cutthroat market (Chien & Tsai, 2012). For businesses to be competitive in today's market environment, which has become more dynamic and unpredictable, they must use cutting-edge procurement techniques. By integrating reconfigurable resources and best practices in a knowledge-rich environment, logistics integration is moving away from traditional processes and toward supply chain agility capabilities of speed, flexibility, innovation, quality, and profitability to provide customer-driven products and services in a fast-changing market environment.

2.3.2 Resource Dependency Theory

Resource dependency theory (RDT) states that organizations are dependent on interconnections and associations with other parties. Based on this theory, managing outward dependencies and resources with supply chain partners can decrease uncertainty due to supply chain disruptions. Considering RDT theory in the field of logistics and supply chain domain, RDT points out that supply chain members need to coordinate and collaborate to ensure greater performance and improvements in the long-term running (Ralston *et al.,* 2022). This theory states that resource sharing would be one of the core practices to acquire an integrated logistics system. The RDT theory highlights that firms need to carry on and control inter-organizational relationships in the proceedings of acquiring resources(Biermann and Harsch, 2017). However, the organization does not have full control over its resources. The survival of an organization is set based on its capability to alleviate environmental uncertainties('Palgrave Handbook of Inter-Organizational Relations in World Politics', 2017). Directing the relationships between organizations is considered a tool to

reduce power disparity and manage reliance (Kaynak, 2003). The level of dependency has a significant productive influence on the inspiration to establish stronger relationships (Perry and Vandenabeele, 2015). Organizations are restricted by social systems from fully achieving desired goals. Therefore, RDT encourages synchronized decisions through integration and collaboration between organizations (Rahadian Perdana et al.,2018). Perspective on logistics integration and SC performance: A Logistics service provision has a vital role in the entire supply chain process, and any disruption of the logistics service providers would lead to a significant impact on supply chain performance (Christensen, Paarlberg and Perry, 2017). Directing to RDT, the integration between focal firms and LSPs is a fruitful strategy to solve any problems in the supply of logistics services. Integration between organizations and Logistics service providers offers a better extent of certainty, which focal firms need to manage their resources for logistics purposes (Rahadian Perdana et al., 2018). Based on RDT, SC is a mutual agreement and a long-term relationship throughout the SC process (Kaynak, 2003). Integration is established for the whole SC network that is needed wherever resources are scarce in the distribution network (Perry, Hondeghem and Wise, 2010). Therefore, the resources are interchanged with organizations to overcome the impact of inadequate resources. Thus, organizations collaborate in the supply chain network to make any uncertainty in their resources more predictable (Perry and Vandenabeele, 2015).

2.4 Empirical Review.

The empirical study of literature is an interdisciplinary field of research which includes the psychology, sociology, and philosophy of texts, the contextual study of literature, and the history of reading literary texts. This section of the chapter reviews reports and discusses the findings obtained by previous studies relating to each of the research objectives.

2.4.1 Logistics Integration and Supply Chain Performance

Various empirical reviews have been undertaken in logistics integration. In the work of (Batarfi & Attia, 2021), the relationship between supply logistics integration, supply performance and competitive performance. Data were collected from 81 respondents from 22 firms in Jeddah via an online questionnaire. The results showed that all variables have a positive effect on each other. The construct of supply logistics.

The work of (Naway and Rahmat, 2019), also explored the link between supply chain capability and supply chain operational performance, firms in the Tin industry of Indonesia are chosen as the sample of the study. To achieve the objectives of the current study, structural equation modelling is used using smart PLS. Data is collected through the mail and telephonic survey. The results of mediation show that for the logistic integration mediation hypothesis, the results were meaningful, whereas for the technology integration the results were not significant.

Further, the work of Alam et al., (2014), analyzed the impact of individual logistics-related factors, namely, supplier involvement (SI), length of supplier relationship (LSR), use of information

technology (IT), and logistics integration (LI) on a firm's supply chain performance (SCP) and test for the mediating effect of LI in a multi-country survey conducted in Brazil, Korea and India. The research methodology was based on designing and administering a survey instrument. Data collected from 187 organizations in Brazil, Korea and India were analysed using the partial least squares structural equation modelling methodology.

Results show that for the combined data, the direct effects of SI, LSR and IT on SCP are insignificant while LI has a very significant direct effect on SCP. On the other hand, except for SI, LSR and IT have significant effects on SCP through LI establishing the mediating role of Logistics integration.

Prajogo & Olhager, (2012), investigated the integrations of both information and material flows between supply chain partners and their effect on operational performance. Specifically, the research examined the role of long-term supplier relationships as the driver of integration. Using data from 232 Australian firms, the research finds that logistics integration has a significant effect on operations performance. Information technology capabilities and information sharing both have significant effects on logistics integration. Furthermore, long-term supplier relationships have both direct and indirect significant effects on performance, the indirect effect via the effect on information integration and logistics integration.

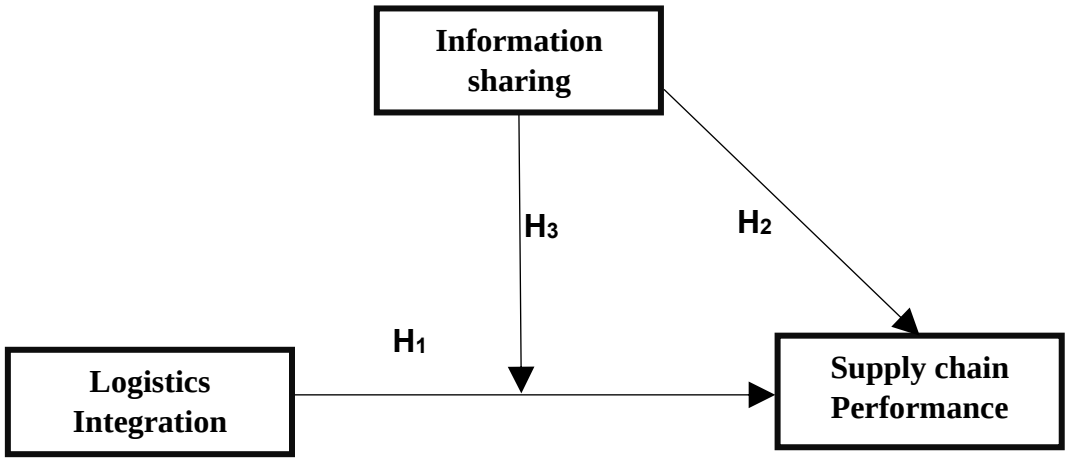
Lim et al., (2017), incorporated the resource dependency theory view to assessing how trust, satisfaction, and commitment affect firms' decisions on logistics integration. The study examined the link between logistics integration and supply chain performance. The study collected data from 250 South Korean manufacturers for analysis. The results revealed positive impacts of trust, satisfaction, and commitment on logistics integration between manufacturing firms and logistics service providers that enhance the logistics service capabilities of the firms. Furthermore, the study showed that building a strategic relationship for logistics services helps manufacturing firms improve their business and operations performances in their supply chain.

Min et al., (2019), also reviewed the literature on the relationship between logistics integration and supply chain performance, to provide an insight into the factors affecting logistics integration capability and operational excellence of firms. A structured analysis of 72 papers published in Scopus-indexed journals in logistics, supply chain and operations management during the period 2015 to 2021 was conducted. A multidimensional conceptual framework for logistics integration and operational excellence was proposed. The literature review noticed that logistics process and operations, information and communication integration, value-added services offered by logistics service providers, and logistics practices are significant factors in logistics integration capability and supply chain operational performances.

2.5 CONCEPTUAL FRAMEWORK

A conceptual framework is an analytical tool that comes in a variety of forms and circumstances. It may be used in a variety of fields where an overall image is required. It is used to distinguish concepts and organize thoughts. The link between logistics integration, supply chain performance, and knowledge sharing is shown in Figure 2.1.

Figure 2.1: Research model



Source: Researcher's Construct (2022)

2.5.1 Logistics Integration and Supply Chain Performance

The high integration of logistical operations between the strategic resources of the supplier and buyer enterprises will help in the creation of implicit and impalpable processes, capacities, and linkages that are unseen and difficult for competitors to imitate (Batarfi & Attia, 2021). Supply logistics integration is the process of establishing links between companies and suppliers to enhance the transportation of products and hence result in a more effective production process (Tseng *et al.*, 2022). Customers and suppliers have benefited from logistics integration in a variety of ways, including higher product quality, cost and time savings, and greater operational competency (Rüßmann *et al.*, 2015). Several studies have shown a positive relationship between logistics integration and supply chain performance (Sun, Shahzad and Razzaq, 2022). The highest integration, according to (Ali *et al.*, 2022) and (Hussain *et al.*, 2022) leads to a substantial relationship with performance improvement. Lim et al., (2017), on the other hand, proposed that higher levels of logistical interaction result in higher levels of supply chain system operational efficiency. A relationship between logistics integration and supply chain performance was identified by (Naway and Rahmat, 2019) The rationale behind these interactions is that integrating an organization's logistical operation with its supply chain members, reduces cycle time, eliminates waste and improves performance. Again, the theory of dynamic capability indicates the use of

resources to achieve performance. By utilizing resources inherent in the chain, an organization can do much more than it could have ever done.

Based on the above, the researcher seeks to hypothesize that;

H1: Logistics Integration positively and significantly correlates with Supply chain Performance.

2.5.2 Information Sharing and Supply Chain Performance

Increasing the amount of integration and information sharing among supply chain partners has become a need for boosting supply chain performance. Such cooperative activities of organizations enable quicker access to essential information, more sensitivity to client demands, and faster reaction times than rivals. Previous research has shown a link between information and performance ((Khanh Chi, 2022; Ronaldo and Suryanto, 2022; Xie and Teo, 2022)). Supply chains that are well-integrated provide value to shareholders by lowering costs and gaining market share Khanh Chi, (2022),. Companies with effective supply chain integration have less inventory, shorter cash flow cycle times, lower logistics and material purchase costs, higher labour productivity, and enhanced customer response (Sezen, 2008).

Similarly, gathering consumer demand information has been demonstrated to reduce inventory costs in a supply chain, (Shahzad et al., 2022). Inventory reductions and efficient resource usage become achievable when the movement of information in a supply chain takes precedence over the actual flow of products and materials (Fernando et al., 2019).

Inventory may now be refilled in a timely and efficient manner thanks to the visibility and constant communication capabilities given by new technologies and information systems (Duong *et al.*, 2020). Gummesson & Mele, (2010) proved that sharing supply and demand information with the supply chain reduced inventory costs and reduced order cycle times. It is also claimed that cooperation and information sharing improve supply networks' capacity to respond to unexpected changes in unpredictable demand conditions (Prajogo & Haggler, 2012).

Adopting the dynamic capability theory, information sharing becomes a strategic tool aimed at streamlining supply chain operations and reducing bottlenecks to improve efficiency.

Based on the above, the researcher posits that;

H2: Information sharing correlates positively and significantly with Supply Chain Performance.

2.5.3 The Moderating Role of Information Sharing

Despite the arguments presented above that highlight the positive relationship between information sharing and supply chain performance, as well as the relationship between information sharing and logistics integration, other arguments have been made that the interaction between information sharing and supply chain performance results in even higher advantages for an organization. Arefin

et al., (2015) found that increased levels of information exchange between a customer and a supplier resulted in greater forecasting accuracy, decreased cycle times and lead times, and improved relationships. In addition, Rachuri et al., (2008) found that when there is a greater degree of information sharing between a buyer and a supplier, the parties involved can exchange new ideas and resources, which leads to an increase in the organization's overall level of innovation. Similarly, gathering consumer demand information has been demonstrated to reduce inventory costs in a supply chain, (Shahzad et al., 2022). Inventory reductions and efficient resource usage become achievable when the movement of information in a supply chain takes precedence over the actual flow of products and materials (Fernando et al., 2019).

The researcher hypothesizes based on the information presented above that;

Hypothesis 3: Information sharing moderates the relationship between logistics integration and supply chain performance.

3.0 METHODOLOGY

3.1 INTRODUCTION

This chapter outlines the approach that the researcher used to accomplish the goals of the study and explains those methods. Included in the sections that are provided are the study design, population, sampling strategy, data collecting techniques, analyses of the data, analyses of reliability and validity, and considerations of ethical issues.

3.2 RESEARCH DESIGN

A study design lays the groundwork for the collection of data and its subsequent analysis. The goal of a descriptive study design is to methodically gather data to characterize a phenomena, circumstance, or population. Instead of focusing on the why, it explicitly assists in addressing the what, when, where, and how issues related to the study topic (Johnson, Adkins and Chauvin, 2020). Exploratory research is described as research conducted to address an issue that is not yet well understood. It is carried out to have a better grasp of the current issue, but it won't provide definitive conclusions(Staples *et al.*, 2007).

The explanatory research design was used for this particular investigation. The research design known as explanatory research is a theory-based methodology in which the researcher is mainly engaged in characterizing the subject matter that is the focus of the investigation. Case studies, naturalistic observations, and surveying are all examples of applications for this method. A survey was chosen for this research, and it focused on one hundred and twenty energy sector businesses that are located within the Greater Accra Region. This study comes under the category of an explanatory study since its primary objective is to evaluate the link between the independent factors and the dependent variable; as a result, the explanatory research design was chosen.The entire strategy that is used while researching a firm is referred to as the "research methodology."

It is possible to make use of either qualitative or quantitative research approaches. Quantitative research emphasizes the use of quantification in data collection and analysis, as well as a logical approach to the relationship between theory and study, with a particular focus on the testing of hypotheses. In contrast, qualitative research may be defined as a research method that prioritizes words over numbers when collecting and analyzing data and emphasizes an inductive approach to the relationship between theory and study, with a focus on theory formation. This contrasts with quantitative research, which may be defined as a research method that prioritizes numbers over words when collecting and analyzing data (Bryman, 2009). This research used a quantitative approach to its methodology.

3.3 POPULATION OF THE STUDY

According to (Fraenkel & Wallen, 2012) the population of a study is "the whole collection of people, things, or numerical values that an investigator wants to investigate." The research population targets senior management staff of energy firms operating within the Greater Accra Region.

3.4 SAMPLE AND SAMPLING TECHNIQUE

Sampling refers to the process of choosing, at random, a subset of a statistical population to make inferences about the features of the larger population. Saunders et al. (2009) state that sampling strategies may be broken down into two categories: probability sampling techniques and non-probability sampling approaches. Techniques for conducting a probability sample are used in situations in which the likelihood (probability) of each instance taken from a population is known and is typically the same in all instances. Methods of non-probability sampling, on the other hand, have an undetermined likelihood of selecting each instance from the whole population. To collect data for this study, a convenient sampling approach was used. One hundred and twenty people made up the study's sample population.

3.5 DATA COLLECTION METHODS

Data collection is defined as the procedure of collecting, measuring and analysing accurate insights for research using standard validated techniques. This section focuses on the sources of data and the data collection instrument.

The research takes use of both primary and secondary sources of information in its data collection. A primary data source is an original data source, which means that the data in question was gathered by the researcher himself or herself to carry out research or complete a project (Cohen et al., 2000). The major method of data collection is the use of an online questionnaire. Information that was gathered by someone other than the original user is referred to as secondary data (Cohen et al., 2000). The investigation looked at a variety of sources, including papers, journals, and books, to gather information about information sharing and supplier relationship management.

The researcher used a primary data source to achieve the study objective: a structured/self-completion questionnaire. The survey instrument included four significant parts that represented the study's constructs: section A gives the profile of respondents, and section B, the predictor variable, is logistics integration. Section C contains the moderator variable, information sharing, and Section D has the predicted variable, supply chain performance. The questionnaire was sent to responders through email and WhatsApp online. The measures for the study's constructs are detailed below.

3.6 DATA ANALYSIS

To derive meaningful information from the data gathered and test the study's hypotheses, the researcher relies on descriptive (mean, standard deviation, skewness, kurtosis, t-value, variance) and inferential analysis (Cronbach Alpha, Exploratory factor analysis, correlation analysis) and structural equation modelling. Descriptive statistics provide insight into the extent of each of the study's variables. Structural equation modelling was used to test the study's model. All analyses were conducted using IBM SPSS (version 26) and Amos version 23.

3.7 PROFILE OF MANUFACTURING IN ACCRA

The Greater Accra Region has the smallest area of Ghana's 16 administrative regions, occupying a total land surface of 3,245 square kilometres. This is 1.4 per cent of the total land area of Ghana. It is the second most populated region, before the Ashanti Region, with a population of 5,455,692 in 2021, accounting for 17.7 per cent of Ghana's total population. The region is the most industrialized with ports, factories and other economic generating activities. The Greater Accra region is the most urbanized region in the country with 87.4% of its total population living in urban centres. The capital city of Greater Accra Region is Accra which is at the same time the capital city of Ghana. Approximately 24.5 percent of Ghana's total GDP is contributed by the industrial sector. It is therefore important that in considering the impact of logistics integration, the region is taking into account. This is because it gives the researcher the ability to investigate different industry practices and perspectives which is crucial to the overall outcome of the project.

4.0 DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

The research findings and results will be presented and fully discussed in this chapter. The study sought to examine the relationship between logistics integration and supply chain performance, while highlighting the role information sharing. The research results and further discussions are based on the objectives set out in the research, and the data were analyzed using descriptive statistics and PLS. The researcher also adopted the use of Frequency, percentages, mean and standard deviations to aid in the analysis.

4.2 RESPONSE RATE

One Hundred and twenty (120) questionnaires were issued, and all hundred and eleven (111) were fully responded to, representing a 92.0% return rate. According to researchers, a response rate above 50 percent is high enough to produce a coherent report (Neff, 2016). As a result, the response may be considered genuine and acceptable for the research.

4.3 DESCRIPTIVE STATISTICS

Detailed explanations of descriptive analytics on logistics integration information sharing and supply chain performance are provided in this section. The descriptive statistics mean, standard deviation, maximum, minimum, and kurtosis were used to analyse the data.

4.3.1 Demographic Characteristics of Respondents

In responding to questionnaires, respondent demographics play a big role; as a result, it is critical to analyse these qualitative factors of the study and evaluate their potential effect on the research output. Therefore, demographic variables such as gender, department, age, job experience and educational level were examined adequately.

Table 1: Respondent's demographic information

Variables		Frequency	Percentage (%)
(1) Gender	Male	58	58.3
	Female	53	47.7
(2) Age	20-29 years	12	10.8
	30-39 years	42	37.8
	40-41 years	48	43.2
	Above 50 years	9	8.1
(3) Work duration	0-5 years	14	12.6
	6-10 years	49	44.1
	11-15 years	33	29.7
	Over 15 years	16	14.4
(4) Highest qualification			
	Professional	24	21.6
	Degree	9	8.1
	Masters	49	44.1
	PhD	31	27.9
(5) Managerial level	Supply chain manager	22	19.8
	Logistics manager	43	38.7
	Operation manager	30	27
	warehouse manager	18	16.2

Source: Field study (2023)

4.3.2 Gender

The table above depicts the demography of the respondents. It can be seen from the above that there was a balance between the male respondents and the female respondents. This was represented by 58.3% and 47.7% for males and females respectively. This depicts gender balance and improves generalization.

4.3.3 Age of Respondents

From table 4.1 10.8%. were between the ages of 20-29 years, 37.8% were between 30-39 years, while 43.2 and 8.1% were between the 40-41 years and 50+ respectively.

4.3.4 Work experience

From the table,12.6% of the respondents had a work experience of up to 5 years. 44.1% of the respondents had a work experience of between 6-10 years. 29.7% represented employees with work experience of up to 15 years, while 14.4% represented above 15 years.

4.3.5 Highest Qualification

It is instructive to indicate that the highest qualification for the respondents was a master's degree represented by 44.1%. this was followed closely by PhD degree with 27.9%, with response rate of 21.6% for professional. And 8.1% for degree.

4.3.6 Managerial Level

The response indicated that logistics managers, 38.7%, was the highest response rate under this section. This was followed closely by operations manager at 27%.

4.3.7 DESCRIPTIVE STATISTICS

Detailed explanations of descriptive analytics on logistics integration and supply chain performance, and information sharing. The descriptive statistics mean, standard deviation, maximum, minimum, and kurtosis were used to analyse the data.

4.3.7.1 Logistics Integration

According to Fernandes et al., (2014) stronger logistics integration may lead to improved corporate operating performance. As a result, logistics necessitates the integrated management of numerous current distribution processes, ranging from activities involving the physical movement of raw materials to activities involving the transfer of completed items from the manufacturing site to the consumer Bueno et al., (2010). The descriptive analysis for these questions under logistics integration is shown in Table 4.2.

Table 2 Descriptive statistics – Logistics integration

Variables	Min	Max	Mean	SD	KurtosisSkewness
1. Inter-organizational logistic activities are closely coordinated.	1	7	4.703	1.418	0.043 -0.573
2.Our logistics activities are well integrated with suppliers' logistics activities	2	7	5.532	1.286	1.107 -0.972
3. We have a seamless integration of logistics activities with our key suppliers.	2	7	3.568	1.743	-0.847 0.149
4. Our logistics integration is characterized by excellent distribution, transportation, and/or warehousing facilities	1	7	4.369	1.671	-0.705 -0.239
5. The inbound and outbound distribution of goods with our suppliers is well integrated	1	7	4.91	1.373	0.627 -0.62
6. We and our major logistics service provider jointly design customized order processes.	1	7	4.919	1.194	1.628 -0.807
7. We make joint decisions with our major logistics service provider about ways to improve cost efficiency.	2	7	4.514	1.457	0.144 -0.505
8. We have developed a mutual understanding of responsibilities with our major logistics service provider	1	7	5.541	1.265	2.011 -1.189
9. We conduct joint planning with our major logistics service provider to resolve operational problems.	2	7	4.793	1.415	0.052 -0.515
OVERALL SCORE	2.10	6.60	4.76	1.42	0.45 -0.59

SCALE: 1 – Strongly disagree; 2 – Disagree, 3 – Somewhat disagree; 4– Neither agree or disagree; 5 – Somewhat agree; 6 – Agree; 7 – Strongly agree

Source: Field study (2023)

Table 4.2 gives extensive data on logistics integration. There were nine questions used to conceptualize the variable. The degree of logistical integration among manufacturing companies is high, with a mean of 4.76 and a standard deviation of 1.42. The item 'We have established a shared understanding of obligations with our principal logistics service provider' received the highest mean score (5.541). The item '. We have a seamless integration of logistical operations and

our main suppliers had the lowest mean of all items in the database (3.568). These two extremes illustrate that, even though logistical integration was determined to be robust, a substantial percentage of this is attributable to the highest reported mean.

4.2.6.2 Supply Chain Performance

In recent years, the business sector has recognized sustainability as a major axis of operations growth. The supply chain sustainability strategy is the theoretical-practical centre axis, with management serving as the nucleus for its formulation and application (Ashby et al., 2012). Authors such as Ahi & Searcy, (2013) noted the presence of twelve definitions with variety in their conception and development axes. According to the conclusions of these writers, the definitions demonstrate the inclusion of the goal of sustainability in the company's actions. The descriptive analysis for these questions under supply chain performance is shown in Table 4.3.

Table 3 Descriptive statistics – Supply Chain Integration

Variables	Min	Max	Mean	SD	Kurtosis	Skewness
1. Our inventory cost is lowered.	1	7	4.874	1.44	-0.277	-0.565
2. Return on assets has increased.	2	7	5.369	1.395	1.694	-1.131
3. Our suppliers' product quality has improved.	2	7	5.171	1.588	-0.146	-0.738
4. Our cost control has improved.	1	7	3.946	1.825	-0.971	-0.099
5. Our suppliers' cost control has improved.	1	7	3.595	1.705	-0.562	0.256
6. Market share has increased.	1	7	5.018	1.542	0.987	-1.032
7. Our main customers are satisfied with our logistics services	2	7	5.063	1.261	1.018	-0.721
OVERALL SCORE	2	7	4.719	1.537	0.249	-0.576

SCALE: 1 – Strongly disagree; 2 – Disagree, 3 – Somewhat disagree; 4– Neither agree or disagree; 5 – Somewhat agree; 6 – Agree; 7 – Strongly agree

Source: Field study (2023)

Table 4.3 gives extensive data on supply chain performance. There were seven questions used to conceptualize the variable. The degree of supply chain performance among manufacturing companies was high, with a mean of 4.719 and a standard deviation of 1.537. The item 'Return on assets has increased' received the highest mean score (5.369). The item "Our suppliers' cost

control has improved' had the lowest mean of all items in the database (3.595). These two extremes illustrate that, even though supply chain performance was determined to be robust, a substantial percentage of this is attributable to the highest reported mean.

4.2.6.3 Information Sharing

According to (Arefin et al., 2015) the difference in organizational effectiveness is influenced by how information is delivered. High-performing firms, for example, employ information technology and systems to efficiently communicate strategic and operational information (Ben-Daya et al., 2017). As a result, to maximize their operations, firms must examine their information technology investments and share critical information across departments (Bilgihan et al., 2011). This kind of information exchange is an internal integrative process inside a firm that merges several roles and helps organizations improve their absorptive ability to acquire, digest, and transfer knowledge (Arefin et al., 2015). The descriptive analysis for these questions information sharing is shown in Table 4.4.

Table 4 Descriptive statistics – Information Sharing

Variables	Min	Max	Mean	SD	Kurtosis	Skewness
People in my organization frequently share existing reports and official documents with members of my organization	1	7	4.919	1.309	1.247	-0.727
People in my organization frequently share reports and official documents that they prepare by themselves with members of my organization	2	7	4.838	1.135	0.631	-0.199
People in my organization frequently collect reports and official documents from others in their work	2	7	5.18	1.224	1.553	-0.799
People in my organization are frequently encouraged by knowledge sharing mechanisms	1	7	5.27	1.215	1.097	-0.749
People in my organization are frequently offered a variety of training and development programs.	1	7	5.09	1.205	0.639	-0.426
People in my organization are facilitated by IT systems invested for knowledge sharing	1	7	4.919	1.459	-0.329	-0.616

OVERALL SCORE	1	7	5.04	1.26	0.81	-0.59

SCALE: 1 – Strongly disagree; 2 – Disagree, 3 – Somewhat disagree; 4– Neither agree or disagree; 5 – Somewhat agree; 6 – Agree; 7 – Strongly agree

Source: Field study (2023)

Table 4.4 provides significant information technology statistics. Six questions were used to conceptualize the variable. With a mean of 5.04 and a standard deviation of 1.26, the degree of information sharing among manufacturing enterprises was high. The average score for the statement 'People in my organization are frequently encouraged by knowledge sharing mechanisms' was the highest (5.27). The items ' People in my organization frequently share reports and official documents that they prepare by themselves with members of my organization ' got the lowest mean of all database entries (4.838). These two extremes demonstrate that, while the conclusion that information sharing is resilient, a significant portion of this is attributed to the highest reported mean.

4.3.3 Test of Reliability and Validity

Reliability is a measure of consistency and is assessed in this study using Cronbach Alpha and composite reliability. Table 5 below provides the reliability results.

Table 5 Results of Cronbach's Alpha and Composite Reliability

Construct	Number of items	Cronbach's Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Logistics integration	9	0.899	0.91	0.923	0.668
Supply chain performance	7	0.808	0.843	0.858	0.57
Information Sharing	6	0.861	0.879	0.891	0.582
Total	**24**	-	-		

Source: Field study (2023)

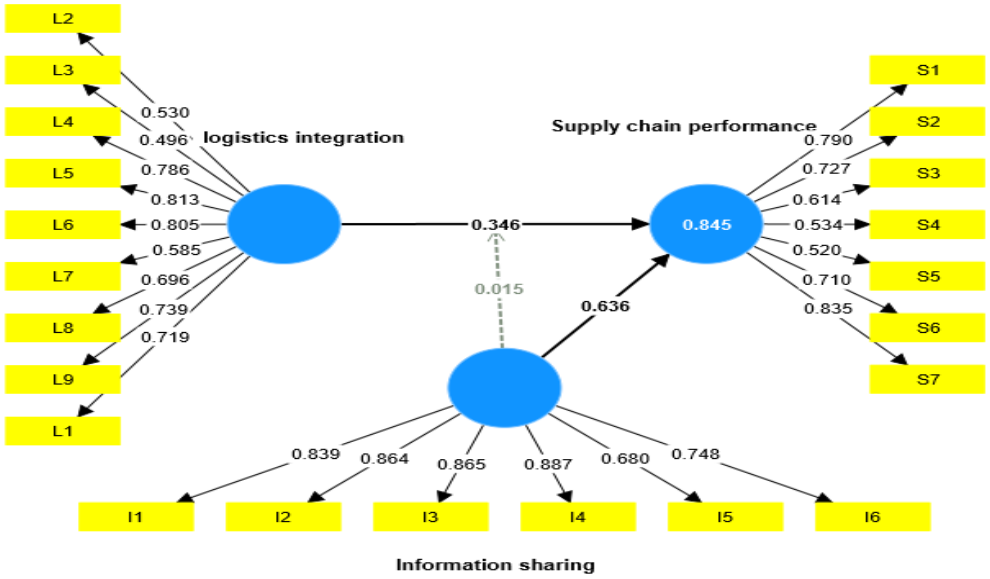
The Cronbach's Alpha and Composite reliability test results, together with the average variance retrieved, are shown in Table 4.5. Alpha value for logistics integration was 0.899 and composite reliability was 0.923; Alpha value for supply chain performance was 0.808 and composite reliability was 0.843; Alpha value for knowledge sharing was 0.861 and composite reliability was 0.9879. The results showed a high level of internal consistency and were consequently trustworthy since all three variables scored above the 0.70 cut-off for Cronbach Alpha and composite reliability. The research employed confirmatory factor analysis and average variance extracted

(AVE) to verify the validity of the data gathered. Ideal AVE values are over 0.50. Table 4.5 shows that every variable (logistics integration, supply chain performance and information Sharing) scored better than the 0.5 cut-off point, suggesting that every item properly measures each variable's associated construct. Therefore, the information satisfies all validity standards.

4.3.3.1 Confirmatory Factor Analysis

A statistical technique called CFA is used to confirm the factor structure of a set of observed data. The researcher may use CFA to investigate the relationship between observable variables and the latent constructs that underlie them. The loadings are shown in Figure 4.1 for each build. All items intended to evaluate logistics integration, supply chain performance and information Sharing loaded over 0.5 except the item with the code L3 which loaded 0.496, as shown in Figure 4.1 below, and as a result, they measure the corresponding latent variables. The information is thus trustworthy. The item with code L3 would therefore be eliminated.

Figure 4.1 Confirmatory Analysis



Source: Field study (2023)

4.3.4 Multicollinearity Test (Variance Inflation Factor)

The variance inflation factor in regression analysis serves as a measure of the degree of multicollinearity (VIF). Multicollinearity in a multivariate regression model that happens when there is a correlation between many independent variables. A VIF score < 5 demonstrates the lack of multicollinearity. The Multicollinearity Test findings are shown in Table 6.

Table 6 Variance Inflation Factor (VIF)

	VIF
People in my organization frequently share existing reports and official documents with members of my organization	2.942
People in my organization frequently share reports and official documents that they prepare by themselves with members of my organization	3.443
People in my organization frequently collect reports and official documents from others in their work	3.572
People in my organization are frequently encouraged by knowledge sharing mechanisms	3.737
People in my organization are frequently offered a variety of training and development programs.	1.839
People in my organization are facilitated by IT systems invested for knowledge sharing	1.946
Inter-organizational logistic activities are closely coordinated.	2.284
Our logistics activities are well integrated with suppliers' logistics activities	1.553
We have a seamless integration of logistics activities with our key suppliers.	1.758
Our logistics integration is characterized by excellent distribution, transportation, and/or warehousing facilities	2.712
The inbound and outbound distribution of goods with our suppliers is well integrated	2.506
We and our major logistics service provider jointly design	2.464
customized order processes.	1.497
We make joint decisions with our major logistics service	2.036
provider about ways to improve cost efficiency.	2.076
Our inventory cost is lowered.	1.858
Return on assets has increased.	1.813
Our suppliers' product quality has improved.	1.559
Our cost control has improved.	2.47
Our suppliers' cost control has improved.	2.229
Market share has increased.	1.942
Our main customers are satisfied with our logistics services	2.308

Information sharing x logistics integration	1

Source: Field study (2023).

Table 6 provides the results of the multicollinearity test. logistics integration and supply chain performance and information sharing. All three variable's VIF loaded less than 5 and therefore the data for the study does not have multicollinearity issues.

Table 7 Exploratory Factor Analysis (EFA)

Items	**Constructs**		
	LI	**SCP**	**IS**
Inter-organizational logistic activities are closely coordinated.	0.563		
Our logistics activities are well integrated with suppliers' logistics activities	0.646		
We have a seamless integration of logistics activities with our key suppliers.	0.616		
Our logistics integration is characterized by excellent distribution, transportation, and/or warehousing facilities	0.713		
The inbound and outbound distribution of goods with our suppliers is well integrated	0.694		
We and our major logistics service provider jointly design customized order processes.	0.649		
We make joint decisions with our major logistics service provider about ways to improve cost efficiency.	0.539		
We have developed a mutual understanding of responsibilities with our major logistics service provider	0.625		
We conduct joint planning with our major logistics service provider to resolve operational problems.	0.514		
Our inventory cost is lowered.		0.745	
Return on assets has increased.		0.458	
Our suppliers' product quality has improved.		0.605	
Our cost control has improved.		0.820	
Our suppliers' cost control has improved.		0.814	
Market share has increased.		0.731	
Our main customers are satisfied with our logistics services		0.763	
People in my organization frequently share existing reports and official documents with members of my organization			0.702
People in my organization frequently share reports and official documents that they prepare by themselves with members of my organization			0.746
People in my organization frequently collect reports and official documents from others in their work			0.821

People in my organization are frequently encouraged by knowledge sharing mechanisms	0.782
People in my organization are frequently offered a variety of training and development programs.	0.588
People in my organization are facilitated by IT systems invested for knowledge sharing	0.768

Source: Field study (2023) Notes: logistics integration, information sharing and supply chain performance.

Table 8 KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.831
Bartlett's Test of Sphericity	Approx. Chi-Square	2255.015
	df	231
	Sig	0.000

Source: Field study (2022)

The KMO test results in Table 4.4 shows a KMO value of 0.901 and Bartlett's Test of Sphericity 2255.015, $p < 0.01$. The KMO results show that the sample size of one hundred and twelve was adequate for the study. Also, Bartlett's Test of Sphericity results shows that the data gathered has a significant correlation.

4.4 Structural Equation Modelling

The route coefficients (also known as direct effects) and moderation connection between the variables were looked at using the PLS Structural Equation model. The study model's route coefficients were established using a bootstrap of 5000 repetitions.

Table 9 Structural Equation Model (SEM) Result

Path	**Coefficients**	**T-value**	**P-value**
Direct Effects			
LI → SCP	0.637	10.67	0.00
IS → SCP	0.345	5.229	0.00
Moderation Effect			
IS*LI →SCP	0.013	0.461	0.645

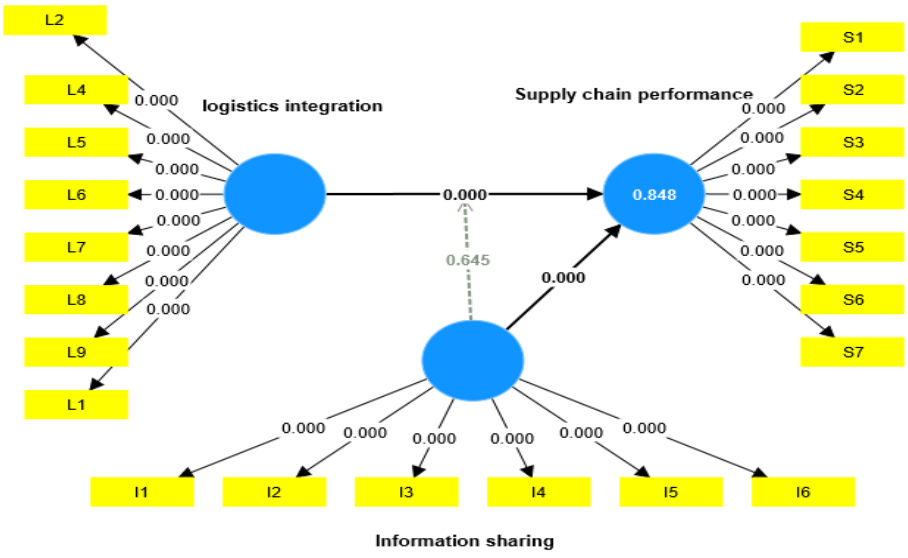
Source: Field study (2023) Notes: logistics integration, information sharing and supply chain performance

The findings of the structural equation model test of the direct, and moderation interactions between the variables are shown in Table 4.9. The table shows that logistics integration has a favorable and considerable impact on supply chain performance, given the path coefficient results **β = .637, t = 10.67, p < .01.** This indicates for every unit of logistics integration, supply chain performance increases by 0.637 units. With a t-value of 10.67 being above the 1.96 threshold, and a p value of < 0.01, the findings lend significant support for ***H1, which stated that logistics integration has a significant and positive effect on supply chain performance***.

The goal of the research was to determine how information sharing correlates with supply chain performance. The results of the SEM demonstrate a favourable correlation, given the path coefficient results **β = 0.345 t = 5.229, p > .01**. This indicates that information sharing has a direct and positive relationship with supply chain management. With a t-value of 5.229 being above the 1.96 threshold, and a p value of < 0.01, the findings lend significant support for ***H2, which stated that information sharing has a significant and positive effect on supply chain performance***.

Finally, the table also shows a positive, yet insignificant moderation role of information sharing given the path coefficient results **β = .013, t = 0.461, p > .05.** This implies that though the moderating role of knowledge sharing was positive, it did not have any relevant impact of the relationship between logistics integration and supply chain performance.

Figure 4.2 Structural Modelling



Source: Field Study, (2023)

4.5 Hypotheses Confirmation

Three hypotheses for this investigation were established from the preceding literature that was evaluated. The collected data are examined to support or disprove each of these theories. In the table 4.10 below, the summary of the hypothesis's verification is provided.

Table 10 Hypothesis Confirmation

Hypothesis	Path	T-value	Coefficient (P-value)	Decision
H_1	LI → SCP	10.67	.637 p < 0.01	**Supported**
H_2	IS → SCP	5.229	0.345; p <0.01	**Supported**
H_3	IS*LI →SCP	0.461	0.461; p > .05	**Not Supported**

Source: Field study (2023) Notes: logistics integration, information sharing and supply chain performance

4.5.2 Logistics Integration and Supply Chain Performance

The high integration of logistical operations between the strategic resources of the supplier and buyer enterprises will help in the creation of implicit and impalpable processes, capacities, and linkages that are unseen and difficult for competitors to imitate (Batarfi & Attia, 2021). Supply logistics integration is the process of establishing links between companies and suppliers to enhance the transportation of products and hence result in a more effective production process (Tseng et al., 2022). Customers and suppliers have benefited from logistics integration in a variety of ways, including higher product quality, cost and time savings, and greater operational competency (Rüßmann et al., 2015). Several studies have shown a positive relationship between logistics integration and supply chain performance (Sun et al., 2022). The highest integration, according to (Ali et al., 2022) and (Hussain et al., 2022) leads to a substantial relationship with performance improvement. Lim et al., (2017), on the other hand, proposed that higher levels of logistical interaction result in higher levels of supply chain system operational efficiency. A relationship between logistics integration and supply chain performance was identified by (Naway & Rahmat, 2019). The result from this study is consistent with the above reviewed literature given the path coefficient results **$\beta = .637, t = 10.67, p < .01$.**

4.5.2 Information Sharing and Supply Chain Performance

Increasing the amount of integration and information sharing among supply chain partners has become a need for boosting supply chain performance. Such cooperative activities of organizations enable quicker access to essential information, more sensitivity to client demands, and faster reaction times than rivals. Previous research has shown a link between information and performance ((Khanh Chi, 2022; Ronaldo & Suryanto, 2022; Xie & Teo, 2022)). Supply chains

that are well-integrated provide value to shareholders by lowering costs and gaining market share Khanh Chi, (2022),. Companies with effective supply chain integration have less inventory, shorter cash flow cycle times, lower logistics and material purchase costs, higher labour productivity, and enhanced customer response (Sezen, 2008). The result from this study is consistent with the reviewed literature above given the path coefficient result **β = 0.345 t = 5.229, p > .01**.

4.5.3 The Moderating Role of Information Sharing

Despite the arguments presented above that highlight the positive relationship between information sharing and supply chain performance, as well as the relationship between information sharing and logistics integration, other arguments have been made that the interaction between information sharing and supply chain performance results in even higher advantages for an organization. Arefin et al., (2015) found that increased levels of information exchange between a customer and a supplier resulted in greater forecasting accuracy, decreased cycle times and lead times, and improved relationships. In addition, Rachuri et al., (2008) found that when there is a greater degree of information sharing between a buyer and a supplier, the parties involved can exchange new ideas and resources, which leads to an increase in the organization's overall level of innovation. Similarly, gathering consumer demand information has been demonstrated to reduce inventory costs in a supply chain, (Shahzad et al., 2022). The result from this study is not consistent with the above reviewed literature given the path coefficient results **β = .013, t = 0.461, p > .05.**

5.0 SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

The study examined the moderating role of information sharing in the relationship between logistics integration and supply chain performance. This chapter discusses the findings summary, conclusions, recommendations, and future study suggestions.

5.2 Summary of Findings

This study sought to assess the impact of logistics integration and competitive advantage of manufacturing firms in the greater Accra region, while considering the moderating role of dynamic capability on that relationship. The study's key findings are summarised in this section.

5.2.1 Logistics Integration and Supply Chain Performance

The study revealed that there is a significant relationship between logistics integration and supply chain performance, given the path coefficient results **β = .637, t = 10.67, p < .01**. This indicates for every unit of logistics integration, supply chain performance increases by 0.637 units. With a t-value of 10.67 being above the 1.96 threshold, there is further support for the above relationship as $p < 0.01$ the findings lend significant support for H1, which stated that logistics integration has a significant and positive effect on supply chain performance.

5.2.2 Information sharing and Supply Chain Performance

The study also showed a positive correlation between Information sharing and Supply Chain Performance, given the path coefficient results $\beta = 0.345$ $t = 5.229$, $p > .01$. This implies that when information sharing increases by 1-unit, supply chain performance increases by 0.345. The output also indicates a T-value of 5.229, which is by far greater than the 1.96 threshold. The effect of information sharing on supply chain performance is significantly different from zero at the 0.01 level ($p < .01$). There is strong support for H2, which states that information sharing correlates positively and significantly with supply chain performance.

5.2.3 Moderating effect of Information Sharing

The study also revealed that information sharing had a positive moderation effect the relationship between logistics integration and supply chain performance, yet it was not significant given the path coefficient results $\beta = .013$, $t = 0.461$, $p > .05$. This indicates that for information sharing does not have any influence of the relationship between supply chain performance and logistics integration.

5.3 CONCLUSION

Supply chain management is often mentioned as a strategic decision to attain competitive success. A company must invest in a range of competence characteristics and make sure that they operate effectively together if it wants to demonstrate quantifiable progress in performance and strengthen its competitive position. Therefore, the usage of knowledge sharing alone may not be able to affect Supply chain performance. Without the essential connection with the suppliers, knowledge sharing could not result in a demonstrable improvement in performance. However, when used in combination with other processes and procedures, i.e., in a setting that encourages integration, it may pay off in terms of enhanced performance. Improving organizational integration and coordination is essential to raising supply chain productivity. In essence, integration is made possible by the other variables. The study derives the following conclusions from the data collected from one hundred and ten (110) manufacturing businesses.

5.4 RECOMMENDATIONS

This section contains the researcher's suggestions and suggestions for further investigation. First, the study demonstrated that supply chain performance is significantly and favorably impacted by logistical integration. Supply chain managers are recommended to utilize technology as part of the strategic objectives to attain supply chain performance across their operations.

The study also shown that information sharing improves supply chain effectiveness. To promote successful information flow across the chain, the report urges managers to use design for disassembly principles, source effective communication, and supplier need-to-know policies.

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