

## Influence of Logistics Capabilities and Outsourcing on Organizational Performance

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### Abstract

Inadequate resources hamper efficient and effective logistics capabilities and outsourcing implementations that are critical to the competitiveness of organizations. This study addresses the inadequate resources that bedevil the cement industry of Ghana by assessing the logistics capability and outsourcing performance of Ghana's Cement industry. The study adopted the survey design and analyzed the data collected using a Variance-based Partial Least Square (PLS-SEM) statistical analytical tool. The result revealed that the capital asset, human resources, and flow of information for logistic capabilities, as well as cross-docking and product marking for logistic outsourcing, significantly influence either financial or non-financial performance or both. Thus, logistics capability and outsourcing positively relate to organizational performance. This suggests that practitioners and managers should improve the flow of information and human resources activities in manufacturing organizations, which would significantly increase both the financial and non-financial performance of the organizations. The implication of sharing suitable information fosters transparency, leading to strengthening ties with suppliers, distributors, and customers for wealth creation

**Keywords:** Logistics capability, outsourcing, organizational performance, joint effect of variance

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## I. Introduction

### Research Background

Organizations' desire to meet complex demands from customers relating to quality goods, services, prompt delivery, cost reduction, and risk reduction requires effective and efficient use of logistics capabilities and outsourcing (Sahu et al., 2024; Guru et al., 2023; Rouhani-Tazangi et al., 2023). According to Pfohl (2023), there are numerous empirical instances of modern businesses, such as Wal-Mart, Dell, and Hewlett-Packard, where logistics offers a decisive role in the firm's strategy as a main driver of corporate profitability and development. Superior logistics systems shared by these businesses are used as a tactical advantage against rivals. In recent years, logistics scholars have begun to acknowledge the strategic role of logistics following the increasing evidence and abundance of empirical examples (Pellathy et al., 2023). This has emphasized the relationship between logistics performance and strategic management (Chen et al., 2024).

An effective combination of logistics capabilities and outsourcing as a strategy will not only reduce an organization's logistics costs (Liu et al., 2024; Lun et al., 2023) but also permit firms to focus on their limited resources while pursuing their core competence. This may enhance their capacity to remain competitive. Logistics capabilities and outsourcing are regarded as foundations on which organizations compete favorably (Dubey et al., 2024). It has been emphasized that a properly managed system of the blend of the two strategies certainly optimizes organizational logistics performance (Ali et al., 2023). Organizations use outsourcing as a strategy to enhance performance and decrease costs (Zwysen, 2024).

Firms that fail to successfully apply their logistics capabilities to increase their performance often suffer the consequences (Wang & Xiao, 2024). For instance, three cement manufacturing companies in Ghana were shut down by the regulatory body (Ghana Standards Authority) on the issue of producing low-quality products for the Ghanaian market (GSA website, 2024). There are schools of thought that these companies might lack logistics capabilities for effective and efficient production systems. This has brought about an argument on whether or not properly managed outsourcing as a strategy can assist organizations to remain competitive (Akbari, 2024). Bettise et al. (1992) assert that there are declines in overall performance due to excess reliance on outside suppliers.

Studies have varied results on the outcome of logistics capability and outsourcing strategies (Zhang et al., 2024). Therefore, there is a need to assess the influence logistics capability and outsourcing have on organizational performance (Zhang et al., 2023). Also, whereas extant literature exists on logistics capabilities, outsourcing, and organizational performance in the electronic commerce market (Bui et al., 2024), literature regarding the cement industry is scarce (Charlse & Ochieng, 2023). Regarding logistics capabilities related to performance studies investigated to date in the cement industry of Ghana, few or no empirical studies have reported on the flow of information (Sitek & Wikarek, 2012), human resources (Mohiuddin & Su, 2013a), capital assets (Zhou et al., 2019) and organizational process (Alioni et al., 2024). Furthermore, in the outsourcing domain, scanty work has been reported on product returns (Chen et al., 2024), traffic management, packaging, cross-docking (Nalepa & Blocho, 2017), and product making (Subramanian & Economist, 2012). Again, studies have covered an extensive range of industries comprising general manufacturing, mineral exploration consumer goods, traditional retail, and e-commerce (Lee et al., 2012). Nevertheless, there is much literature written on the cement industry but insufficient or no literature is available on the influence of logistics capabilities and outsourcing in the cement industry of Ghana. Moreover, scholars contended that for the past 20 years logistics outsourcing activities have been one of the most used services in many organizations, however, need more understanding (Kotlars & Skribans, 2023). Again, studies relating to logistics use various theories such as integrative theory (Darko et al., 2023), stakeholder theory, and institutional theory, among others. In the context of this study, we align with the Resource-based view (RBV) argues that firms use logistics capabilities as a resource to gain a competitive advantage.

To address these gaps, this study assesses the influence of logistics capabilities and outsourcing on organizational performance in Ghana's cement industry, as this industry thrives on outsourcing to meet customer needs. Also, logistics capabilities and outsourcing were interchangeably used as a single exogenous construct. The researcher used logistics outsourcing as a mediator between the exogenous construct (logistics capabilities) and endogenous construct (Organization performance) because the use of these two constructs will aid practitioners in understanding the contributions organizational performance offers from a different perspective. Specifically, we sought answers to the following questions:

1. What is the extent to which logistics capabilities influence the financial and non-financial performance of an organization?
2. What is the extent to which logistics outsourcing influences the financial and non-financial performance of an organization?

We seek to make the following significant contributions to literature.

*Firstly*, we contribute to resolving and reducing the resource inadequacy challenges the cement industry of Ghana faces. It will also increase logistics capabilities and outsourcing activities of the cement industry. Essentially, decision-making regarding this area was predicted to improve organizational performance, understanding of satisfying consumers with quality products, and services, reduce organizational costs, fast-track activities, upgrade customer fulfillment, and increase the specialized skills of staff using employees' expertise.

*Secondly*, this study contributes to the literature by reechoing logistics capabilities as a means of Competitive Advantage. Understanding how logistics capabilities contribute to an organization's competitive advantage can help businesses optimize their supply chain strategies. Companies can leverage advanced logistics capabilities to differentiate themselves in the market by providing faster, more reliable, and cost-effective services.

*Thirdly*, from the theoretical point of view, the Resource-based view (RBV) highlights the importance of integrating internal resources with external resources through outsourcing to maximize performance. Firms can explore how effective integration of in-house logistics capabilities and outsourced functions enhances overall efficiency and effectiveness. Again, RBV can guide decisions on which logistics functions to outsource based on the assessment of internal capabilities versus external providers' expertise. Firms can explore how outsourcing non-core logistics functions permits firms to focus on their primary competencies, enhancing overall performance.

The rest of the paper is structured as follows: a review of the literature on key constructs, their relationships, and the development of hypotheses. Next is the methodology, which consists of the population, sampling, construct measures, and data collection. Further study areas are presented. Several theoretical assessments that serve as underpinning operations remain to be examined in the literature. Generally acknowledged theories include, the resource-based theory of the firm, transaction cost theory, core competency theory, agency theory, and dynamics capabilities. Although generally accepted, they are without limitations and assumptions, hence requiring demanding and critical analysis within an organizational context. This has necessitated the review of the theoretical underpinnings of the concept of outsourcing.

### **The Gap in the Literature**

The scientific literature on logistics outsourcing and capabilities is growing rapidly, especially in developed nations (Driouich et al., 2024; Okoye et al., 2024), but despite this growth, little attention has been given to how logistics capabilities and outsourcing influence organizational performance from the developing nations perspective (Kavcic et al., 2015). Other scholars have added this assertion, indicating that logistics outsourcing and capabilities are widely popular in Europe (Kotlars & Skribans, 2024), North America, and Asia Pacific regions (Chen et al., 2010). However, less is known about logistics capabilities and outsourcing in other geographical regions, including West Africa, and Ghana. Institutional, structural, and globalization forces including transformations that are emerging in West Africa, Ghana, guaranteed fast-tracked economic opportunities in the country, the various raw materials that are mined in the country such as gold, oil and gas, and recently lithium in large commercial quantities requires support from a robust and vibrant cement industry for construction infrastructure works. This is a call for efficient and effective understanding and implementation of logistics capabilities and outsourcing in the cement industry of Ghana.

Nevertheless, there are currently mixed results concerning the impact of logistics capability and outsourcing on organizational performance. While some scholars assert that logistics capabilities and outsourcing have a positive and significant impact on organizational performance, other authors refute that assertion but indicate that logistics capabilities and outsourcing have a negative and insignificant impact on organizational performance (Bettise et al., 1992). These conflicting results created a gap, which this study sought to establish.

Furthermore, the Cap Gemini Ernst Young survey (2002), discovered that the degrees of resorting to logistics suppliers have reached 94% in Europe, 78% in North America, and 92% in Pacific Asia. However, literature is silent on Africa, and Ghana. This study detailed the understanding of the influence of logistics capabilities and outsourcing on financial and non-financial performance in the cement industry of Ghana.

The association between outsourcing activities and organizational performance was investigated in Iran's Isfahan Bureau of Transactions. Where it was discovered that there is a positive relationship between logistics outsourcing and organizational performance (Dehaghi, 2021). Owusu and Duah conducted a study on the "effects of outsourcing intra-port haulage operations of production: the case of cocoa marketing company Ltd, Takoradi" using a case study. There were interesting findings, intimating that outsourcing of intra-port haulage operations of Cocoa Marketing Company Limited, Takoradi, had reduced cost benefits. The present study focused on Ghana's cement industry using a survey. An inquiry focusing on the relationship between constructs was conducted in the mining industry of Namibia on practices of logistics outsourcing and organizations' ability to perform, where a positive relationship was discovered (Nzitunga, 2019). A further study in Slovenia by Kavcic and Suklan (2015) assessed the performance of logistics outsourcing in the firm where a positive association was obtained. In Pakistan, a study was conducted by Usain and Siddiqui, (2018), which required the definition of the main factors that form logistics, and these factors were recommended to comprise; human and physical assets as well as partnerships. Njoroge and Nyamwange (2017) identify key factors that limit import logistics outsourcing by taking clue evidence from production organizations in the Eastern African country, Kenya. Kyusya, (2015) concentrated on Kenya's shipping industry to look for a link between logistics outsourcing and the operational capabilities of an organization. The study revealed that logistics services help organizations focus further on core activities which may increase their performance. Notwithstanding, Gedi, (2022) analyzed supply chain sustainability and its links with competitors' stance of the manufacturing organizations in Somalia. Farah, (2015) concentrated on supply chain management and its link with the capability of manufacturing organizations to reform where a significant association was discovered.

From the above studies, some of the studies were certainly investigated in developed nations like Slovenia and the US but not in Ghana. This creates a contextual gap. Other studies focused on constructs such as operational performance, not organizational performance resulting in the conceptual gap. The few studies conducted on logistics outsourcing in Ghana were investigations carried out on oil and gas and other sectors excluding the cement industry of Ghana, more importantly, none of the studies carried out in Ghana used logistics capabilities and logistics outsourcing as joint constructs of the exogenous variables in predicting financial and non-financial performance of the cement industry of Ghana, creating a gap to be filled. The present study answers the research question; what are the influence of logistics capabilities and outsourcing on organizational performance in the cement industry of Ghana?

### **Aim and Originality of the Study**

This study aims to assess the influence of logistics outsourcing and capabilities in Ghana's cement industry. Achieving this aim signifies an understanding of the joint influence of variance on the performance of Ghana's cement industry. This certainly creates more insights for industry practitioners on the significance of information flow to increase organizational performance. Ghana's cement industry is serving the entire Economic Communities of West African States (ECOWAS). This steady demand calls for an understanding of the logistics services to curtail the prevailing challenges of low-quality products among others. Quantitative research was designed to study the link between the joint influence of variance of logistics outsourcing and capabilities.

Demonstrating the originality of the study, (Bonney et al. 2022), investigated a study on the consumer preference for cement brands used in concrete construction; from the Ghanaian viewpoint. Results indicate that customer's preference varies from brand to brand. Similarly, the effects of supply chain digitization and internal supply chain integration of cement manufacturing and distribution firms in Ghana were investigated (Okyere et al., 2023). The drive of the study was to evaluate the influence of supply chain digitization on the internal supply chain incorporation of firms with a focus on cement manufacturing and distribution firms in Ghana. The authors approved a cross-sectional qualitative research design. It was revealed that positive, moderate, relationship between the drivers of supply chain digitization and internal supply chain integration. Furthermore, Watiri and ba (2017) investigated the effect of supply chain practices on competitive advantage in the cement manufacturing industry. The author's goal was to assess the effect of supply chain management practices on competitive advantage in the cement manufacturing industry. A comprehensive conceptual framework was developed by the authors, strategic supplier partnership and customer relationship were used as exogenous constructs against the competitive advantages as endogenous constructs. Results indicate that strategic supplier partnerships influence the competitive advantages of the cement manufacturing industry.

In pursuit of filling this conceptual gap, the study sought to measure the joint influence of logistics outsourcing and capabilities on Ghana's cement industry.

## II. Literature Review and Development of Hypotheses

Resource-based view theory asserts that organizations are seen as a package of assets diversely distributed throughout the organization, and also, access and changes among resources take a particular kind of tenacity within a period (Alkaraan et al., 2024). This opinion had extensive arguments that resources are collectively combined and put into varied use and tagged as dynamics capabilities. Where justifiable, modest, benefits are attainable, if organizations possess appreciable, rare, not imitated, and non-substitutable assets and, by these, apply value-creation approaches (Chaudhary, 2024) opposed the earlier assertion and suggested that dynamic capabilities are perceived as indications for organizational and premeditated procedures by which leaders regulate, acquire, integrate, and recombine their capital base to produce value-creating strategies. Scholars familiarize the three dynamic capabilities of sensing, seizing, and reconfiguration to produce first-hand paths and power- -bases to uphold and upsurge organizational performance optimization and economic benefit (Danes Hvar Kakhki et al., 2023). Competences can be categorized as functioning or dynamic (Teece & Pisano., 2023). Operational capabilities are; skillful practices and effective communications among stakeholders and their achievements, forms of behavior turned into everyday life activities that reduce the need for a problem-solving inquiry (Alkaraan et al., 2024). Observing customs is a significant idea for the familiarity of performers (Barata et al., 2024).

Linking the theory to this study has to do with the desire to solve the recurrent problems of Ghana's cement industry's inadequate logistics capabilities and outsourcing. The absence of these resources impedes both the financial and non-financial performance of the industry. The assumption that these resources (logistics capability and outsourcing) relate to organizational performance requires empirical testing and proving. Thus, the hypothesis is that logistics capabilities and outsourcing positively influence organizational performance.

### Organizational performance

Organizational performance can be considered as the capability of an organization to fulfill stakeholders' necessities and accomplish influential advantages (Evangelista et al., 2023). In today's rival environment, organizations are not as keen on improving their operational performance (Mubeen et al., 2022). Despite this organizational performance needs to be evaluated through progressive operations and financial benefits (Yu et al., 2022). Thus, financial measures are crucial for the appraisal of organizational performance. Financial monetary measures comprise return on resources (ROA), return on investment (ROI), return on equity (ROE), commercial center share, deals, and productivity of the business. Measuring an employer's performance may be exceptionally overwhelming since it requires the organization's length to harvest the preferred (Sauermann, 2023). Performance measurements chosen, ought to be incremental-based including monetary liquidity and benefactor fulfillment but not ignoring others' performances such as logistics performance.

Logistics outsourcing grants the organization the capacities of proficient logistic carrier companies to achieve unrestrained logistics performance for instance reduced cycle times, rebate of unproductive operations, progressive adaptability, transport convenience, and clean operations workouts (Darom & Hishamuddin, 2023). Chauhan et al. (2023) contended that logistics activities impact workplace performance. We hypothetically proposed that logistics outsourcing has a positive and significant effect on organizational performance (Evangelista et al., 2023).

Logistics outsourcing suggests the number to which logistics companies meet trade responsibility desires (Afum et al., 2021). Logistics outsourcing strategies reflect communication, acknowledgment, participation, and advancement, reasonable to bring about unrestrained logistics outsourcing performance (Sanderson et al., 2022). In expansion, Leuschner et al. (2014), assert that logistics outsourcing implementation unquestionably affects organizational performance. Logistics outsourcing has developed as one such strategy that can be utilized to realize productive and viable logistics operations, third-party logistics (Khan et al., 2023). Even though the harmonization of outsourcing leads to organizational performance (Pereira et al., 2019), the connection between logistics outsourcing and the performance of a company has not been built up completely.

### Logistics performance

The diversities in improvement, implementation, strategies, and tactics of radical logistics facilities and services differ from nation to nation. Emerging nations' implementation and adoption of logistics services are often few and sometimes do not practice it all (Bugarčić et al., 2020), this does not attract multinational organizations to these markets. Therefore, it is prudent that managements of nations at several levels need to ensure that controlling, policies, rules, and conditions do not excessively restrict and affect the logistics sector. The logistics performance indicators are grounded on seven (7) fundamental aspects of logistics performance (Atmojo &



Wibisono, 2023). They are (1) competence of the authorization procedure by customs and other organizations; (2) superiority of conveyance and Information Technology (IT) structure for logistics; (3) affluence and accessibility or ordering worldwide consignments; (4) capability of Indigenous logistics business; (5) capability to footprint and trace worldwide consignments; (6) local logistics charges and (7) appropriateness of consignments in accomplishment terminus. Predictability and dependability are attractive and even more significant than costs. Hence, high-income organizations for economic co-operation and Development (OECD) nations frontier in logistics optimization.

### Logistics capability and organizational performance

Logistics capabilities indicate the assets an organization possesses (Craig et al., 2023) and are related to reasonable benefit and major organizational performance (Guo & Lu, 2023). Past investigations carried out found that logistics operations influence performance, income improvement, and decreasing costs. For instance, Cho et al. (2023) examined logistics usefulness (Hoang et al., 2023), outsourcing, and company performance in e-commerce (Hoang et al., 2023). Thus, the enhancement of key utilization of logistics capabilities for competitive advantage is the rule basis for many organizations. Logistics capability can make primary commitments closer to progressive performance and reinforce dynamic advantage. Kirono and Hadiwidjojo (2019), revealed how organizations applied logistics usefulness to attain dominance.

Furthermore, it is worth stating that previous studies found that logistics capability has a positive and significant impact on organizational performance (Al Shraah et al., 2022). According to Wang et al. (2020), logistics capabilities such as demand management and information management capabilities permit organizations to distinguish their logistics activities from competitors. According to Rizki et al. (2022), logistical capability, if Wang appropriately managed, can turn out to be a core competency for organizations geared toward accomplishing competitive advantage and performance. Grounded on the narrative above, the first hypothesis of this study is:

H<sub>1a</sub>: Logistics capabilities positively and significantly influence financial performance

H<sub>1b</sub>: Logistics capabilities positively and significantly influence non-financial performance

### Logistics outsourcing and organizational performance

Logistics outsourcing is considered as the transfer of tasks known as logistics function to the outside resources or third-party logistics (3PL) (Qiu et al., 2023). A study shows that organizations decrease costs and optimize client service by outsourcing their logistics tasks (Amberg, 2022). Furthermore, research has been investigated on logistics outsourcing and the field viability remains attractive (Solakivi et al., 2022). Previous studies categorized outsourcing operations into two sections. First, conventional logistics outsourcing operations comprise warehousing, inbound and outbound transportation, freight consolidation and distribution, freight invoice audit, and payment (Caruso, 2022). Second, outsourced logistics outsourcing operations comprising minor manufacturing, cross-docking, product marketing, labeling, packaging, opposite logistics, site visitors' management, fleet operations, and statistics technology (Elias et al., 2022).

Outsourcing arises from several factors such as price discount, quality improvement, middle competence, decrease in capital investment in equipment, centers, and human resources, and timely transport improvement (Diem et al., 2022). However, limited pragmatic links exist between the usage of each logistics capability and logistics outsourcing as exogenous constructs in predicting organizational performance in Ghana. Cutting-edge corporate tendencies wage crusades for many companies to review their primacies and plan their assets on a restricted range of adopted processes (Raja & Venkatachalam, 2022). This results from increasing usage of groups to outsource logistics activities. Organizations' logistics outsourcing activities are further willing to govern the capability of external service providers to distinguish and attain aggressive benefits within the market (Mbanje, 2022). They highlighted the importance of custom-designed 3PL providers concentrating on mixing the service provider's human and monetary sources to generate a sincerely tailored carrier (Ofe & Sandber, 2023). These studies have discovered that 3PLs create good-sized costs with the aid of offering custom-designed solutions to companies lacking an internal logistics feature, able to impart aggressive gain or differentiation. Pratap (2014) contended that logistics outsourcing can be clarified through the RBV and TCE assumptions. The RBV concept suggests that an organization can gather assets and abilities through outsourcing to satisfy its customers' requirements (Ozcan & Yumurtaci, 2023). Essentially, the TCE thought suggests that logistics outsourcing gives a road for carrying out business at reduced exchange costs likened to in-house operations (Tessaro et al., 2023). The RBV and TCE hypotheses are impressively connected in logistics outsourcing implementation (Selvaraj et al., 2023; Zhou et al., 2023). As logistics performance becomes critical, organizations are anticipated to concentrate on their primary

activities to be considered for outsourcing to 3PLS providers (Chejarla et al., 2023). Utilizing logistics service providers (LSPs) implies that the businesses would get the right passage to the logistics capabilities they need in-house, to upgrade performance (Akbari, 2023; Effah et al., 2023). Logistics outsourcing is additionally perceived to decrease logistics failures but promotes a long-term approach to improving customer fulfillment and advancement of organizational performance (Lee, Lin & Cheng, 2013). Logistics that covers most parts of outsourced functions can be categorized into operational activities such as (transportation, fleet management, clearing, and distribution), understanding valuation (logistics measurements framework, achievement, management), and key-value including management (stock, warehousing, and bundling management) (Liu & Deng, 2015).

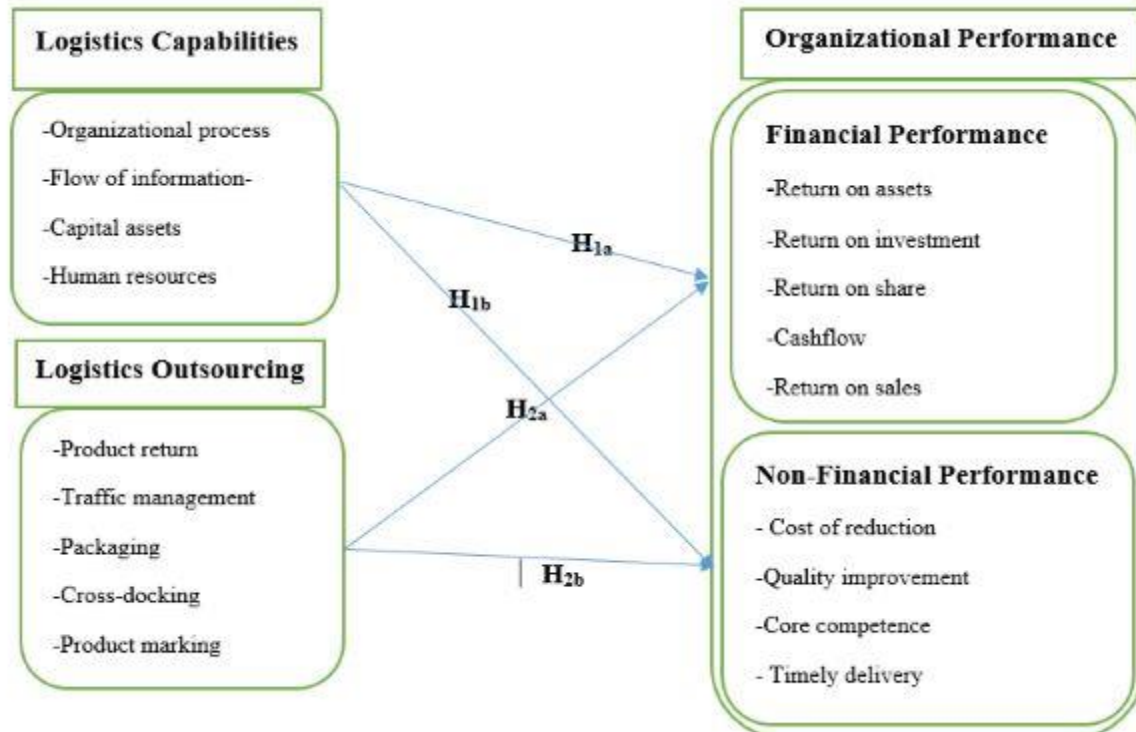
Extant literature found that logistics outsourcing has both positive and significant effects on organizational performance (Musau, 2016; Dehaghi, 2021). An extensive assessment of some practical studies recommends that outsourcing can produce positive, negative, mixed, moderated, or no substantial effect on organizational performance (Lahiri, 2016; Ishizaka et al., 2019). Based on the description stated above, the second assumption of this study is:

H<sub>2a</sub>: Logistics outsourcing has a positive and significant influence on financial performance

H<sub>2b</sub>: Logistics outsourcing has a positive and significant influence on non-financial performance

### Conceptual framework

There are three constructs to help in the assessment of whether or not logistics capabilities and Logistics outsourcing influence organizational performance. There are two exogenous variables namely logistics capabilities variables (logistics processes, flow of information, capital asset, and human resources) and logistics outsourcing variables (Product returns, traffic management, packaging, cross-docking, and product marketing). Whereas, organizational performance serves as endogenous variables (Cost reduction, Quality improvement, Core competencies, Reduction in capital investment, Timely delivery, Risk reduction, Gaining access to sophisticated technologies). The assessment is to address how the exogenous variables explicitly and jointly predict the endogenous variables.



**Figure 1:** Conceptual framework indicating the influence of logistics capabilities and outsourcing on organizational performance

Source: Adopted from (Cho et al., 2008; Oliveira Neto et al., 2018; Teece, 2003)

### III. Methodology

This study embraced the quantitative method specifically a survey to collect data and descriptive survey design. The approach is appropriate and suitable for analyzing cause-and-effect relationships between variables under investigation (Saunders, 2016). This method permits the gathering of data through surveys or designed questionnaires. Ghana's cement industry possesses homogenous characteristics even though the industry can be found in most of the regions in Ghana. A survey involves extremely superior representative samples which is appropriate and suitable for discovering, assessing, and predicting the connections between measures, perceptions, and behavior, hence, suitable to be chosen for this study. Other strategies such as experiment, action research, archival, and ethnography were proven to be disjointed with the study's question and the aim of the study.

#### Population and sampling strategy

The unit of analysis for this research was cement manufacturing organizations in Ghana. (Diamond Ghana Cement, Ghacem Limited, CIMAF Ghana Cement, CBI Ghana Ltd, Dzata Cement, Savannah Cement, Western Diamond Cement, Africa Cement Limited, ABBANSCO Cement, and Dangote Cement Ghana). For this study, two hundred and twenty (220) respondents were selected from the targeted cement organizations amongst the above list to answer the questionnaire. To achieve a representative sample of the population of the study, the researchers used a variable ratio method of 1:5 to obtain the sample size. A variable for five respondents sample size is appropriate for structural equation modeling. Therefore, based on 1:5, 44 variables accounted for 220 respondents comprising management, procurement officers, store managers, operations managers, logistics officers, and engineers of the cement manufacturing firms.

#### Measures development and data collection

Five-item Likert scale was adopted by the researchers to measure the responses of all main constructs. The English language was used to conduct the survey. The constructs used for the exogenous and endogenous measures are Logistics capabilities, Logistics outsourcing, and Financial and non-financial performance.

To validate the scales, six (6) experts in the area of logistics, procurement, and supply chain management were selected to indicate their agreement and disagreement on the relevance of the scales used by the authors. The experts were given a four-point Likert scale (1 = not relevant, 2 = slightly relevant, 3 = relevant, 4 = extremely relevant) to independently fill in the validated criteria. Next, the items' validity was estimated using the Content Validity Index (CVI). We calculated the item CVI by dividing the proportion of experts rating an item 3 or 4 by the total number of experts. Lynn (1986) argued that a CVI of 1.00 should be used when there are fewer than five experts, but a CVI must be 0.83 when there are at least six experts. Results revealed that most of the experts indicate the validity of the scale suggesting its usefulness in the content.

According to Yin et al. (2023), successful data-gathering procedures are dependent on many essential factors not excluding the need to identify appropriate and possible participants, instituting a clear explanation of the suitable sampling frame, the medium, and the approach to conducting the fieldwork, and finally, how the data gathered is received, revised, coded, and analyzed. Stausberg, (2021) showed that surveys were the most efficient method for collecting data from a dispersed population. Questions about the understudied topic (logistics outsourcing and organizational performance) and the respondents' demographics comprised the two (2) sections of the survey instrument. Questionnaires achieve suitable and economical ways of gathering useful information from participants and could cover a large geographical area (Hunter, 2012). Although, a qualitative questionnaire was flexible and the possibility of wording it to suit respondents, this study deemed it fit to use a survey questionnaire.

### IV. Data Analysis

This research adopted a quantitative approach to data analysis. The data collected was edited, sorted, and coded. Variance-based Partial Least Square (PLS-SEM) was the statistical analytical tool appropriately selected for the analysis of the data collected. Table 1 shows the demographic characteristics (gender, age, education, years of work experience, and rank) of the respondents. According to the demographic data, 74.1% of respondents were males and 25.9% were females. According to the data below, 29.1% of respondents are aged less than 30 years old, 40.9% are between the ages of 30 and 40, 14.1% are between 41 and 50, and 15.9 are older than 51. According to the table's highest academic qualifications, 21.4% of respondents had a bachelor's degree, 44.1% had a master's and 34.5% of respondents held professional certificates (CIPS, CILT). On the matter of respondents' years of working experience, the data indicates that 27.7% had 1–5 years of experience, 44.1% had 6–10 years, and 28.2% had 10 years or above.



**Table 1:** Descriptive statistics

	Frequency	Percent
<i>Sex</i>		
Male	163	74.1
Female	57	25.9
<i>Age</i>		
Less than 30 years	64	29.1
30-40 years	90	40.9
41-50 years	31	14.1
51 years and above	35	15.9
<i>Highest academic qualification</i>		
Pre-tertiary	47	21.4
Tertiary	97	44.1
Post-tertiary	76	34.5
<i>Years of working Experience</i>		
1-5 years	61	27.7
6-10 years	97	44.1
10 years and above	62	28.2
<i>Rank</i>		
Junior staff	162	73.6
Senior staff	58	26.4
<i>Position</i>		
Professional	75	34.1
Non-Profession	145	65.9

**Source:** (Author, 2023)

### Harman's One-Factor Analysis

Harman's single factor test (Podsakoff et al., 2003) was employed to evaluate the likelihood of common method bias within our dataset. The findings demonstrated that the initial factor explained merely 22% of the variance. This suggests that common method variance did not pose a major concern in this study.

### Estimation of Partial Least Square Structural Equation Modeling (PLS-SEM)

The influence of logistics capabilities and outsourcing on organizational performances was assessed through the use of partial least square structural equation modeling (PLS-SEM). The model was built under an exploratory nature in which PLS-SEM was the sole purpose. Following the guidelines for PLS-SEM (Hair et al., 2019), indicators with loadings of 0.70 or higher threshold values were retained while factor loadings below 0.70 were excluded during the measurement model assessment. This procedure did not require preliminary analysis of exploratory factor analysis since the indicators of the main constructs were already grouped. The model was built on a reflective measurement model with non-single-item constructs. According to Hair et al. (2014), PLS-SEM has more statistical power than covariance-based models as a result of its high efficiency in parameter estimation. Superior statistical power indicated that PLS-SEM was more probable to deem a certain association or influence substantially when it was significant in the population. Hair et al. (2014) outlined PLS-SEM data, model, and algorithm features. The PLS-SEM model in the study met all the underlying assumptions or properties. The data characteristics established a sufficient sample size as a result of increasing the precision of the estimations, the scale of measurement was ordinal, and no distributional assumptions were required. The model was built with multi-item variables, which deals with multifaceted models with several structural model relationships, and a large number of indicators helped reduce bias and allowed a recursive model. The model algorithm was built on the premise that it minimized unexplained variance and converged after a few iterations to the highest solution (efficient algorithm). The evaluation model issue lacks a global goodness-of-fit criterion; model fit indicators are thus not required. The assessment strategy for the measuring model was either reflective or formative, although this study employed the reflective method. The PLS-SEM also allows for the determination of the collinearity of set-off constructs, importance of path coefficients, coefficient of determination, effect size, predictive significance, and predictive power.

### Evaluation of measurement model

Estimating the measurement model's results in assessing the influence of logistic capabilities and outsourcing on organizational performances using a reflective measurement approach. Hair et al. (2014), posited that a reflective evaluation is a measurement model architecture in which the arrows point from the construct to the measurement items, signifying the notion that the construct drives the measurement of the indicator variable. The evaluation criterion of reflective measurement comprised assessing the internal consistency, indicator reliability, convergent validity, and discriminant validity.

In addition, the convergent validity of the constructs was measured using the indicators' reliability. Indicators' outer loadings should be mathematically significant; thus, standardized outer loadings must be 0.70 or more (Hair et al., 2014). The initial model revealed LCOP5, LCCA6, LCHR1, LCHR6, LOPR5, LOTM2, NFP1, NFP2, NFP3, and NFP10 recorded low outer loadings below the minimum limit proposed by (Hair et al., 2016; 2017). The outer loadings of the indicators that passed the recommended limit of 0.70 were presented in (Table 2 and Figure 1).

The internal consistency reliability was measured using Cronbach's alpha, composite reliability, and outer loadings of the indicator variable of a specific construct. Cronbach's alpha and composite reliability standards stretched from 0 to 1. The threshold for both measures indicated values starting from 0.70 to 0.90 regarded as satisfactory. Values of 0.95 and higher are undesirable, as they imply that all indicator measures were assessing the phenomena and are thus improbable to be genuine measures of the concept. From the results (Table 2), Cronbach's alpha values and composite reliability values were within the conventional range (CA: 0.781 – 0.925, CR<sub>a</sub>: 0.821 – 0.936 and CR<sub>c</sub>: 0.849 – 0.942). This suggested that there was a presence of internal consistency and reliability in the model. The average variance extracted (AVE) measured the average value of the squared loadings of indicators' relationship with the construct. The AVE value of 0.50 or greater indicates that, on average, the construct elucidates more than fifty percent of the variation it exhibits. The results (Table 2) provided higher values above the threshold of 50% demonstrating convergent validity on the construct level.

**Table 2:** Reliability and Validity of the Constructs

Construct	Indicators	Outer loadings	$\alpha$	CR <sub>a</sub>	CR <sub>c</sub>	AVE	VIF
Financial performance	FP1	0.758	0.925	0.928	0.940	0.690	2.327
	FP2	0.815					3.408
	FP3	0.834					3.387
	FP4	0.870					3.069
	FP5	0.835					3.141
	FP6	0.870					4.222
	FP7	0.829					3.181
Capital Assets	LCCA1	0.909	0.925	0.935	0.942	0.764	3.732
	LCCA2	0.900					3.267
	LCCA3	0.863					3.527
	LCCA4	0.791					2.673
	LCCA5	0.902					3.203
Flow of Information	LCFI1	0.841	0.888	0.889	0.918	0.691	2.252
	LCFI2	0.808					2.043
	LCFI3	0.868					3.080
	LCFI4	0.854					2.713
	LCFI5	0.781					1.858
Human resources	LCHR2	0.783	0.830	0.860	0.887	0.664	1.729
	LCHR3	0.874					2.103
	LCHR4	0.874					2.189
	LCHR5	0.716					1.490
	LCOP1	0.874					1.550
Organizational Process	LCOP2	0.779	0.781	0.936	0.849	0.589	1.925
	LCOP3	0.565					1.362
	LCOP4	0.818					2.061
	LOCD1	0.838					1.934
Cross-Docking	LOCD2	0.867	0.841	0.862	0.892	0.675	2.049
	LOCD3	0.769					1.772
	LOCD4	0.809					1.869
Packaging	LOP1	0.844	0.879	0.884	0.912	0.675	2.177

	LOP2	0.814					2.181
	LOP3	0.794					2.070
	LOP4	0.811					2.249
	LOP5	0.844					2.411
Product Marking	LOPM1	0.769	0.863	0.876	0.900	0.643	1.847
	LOPM2	0.816					1.905
	LOPM3	0.797					2.009
	LOPM4	0.772					2.057
	LOPM5	0.851					2.577
Product Returns	LOPR1	0.799	0.815	0.821	0.877	0.641	1.784
	LOPR2	0.749					1.415
	LOPR3	0.805					2.198
	LOPR4	0.847					2.518
Traffic Management	LOTM1	0.917	0.891	0.895	0.932	0.822	2.821
	LOTM3	0.881					2.289
	LOTM4	0.921					3.084
Non-Financial performances	NFP4	0.829	0.900	0.903	0.924	0.669	2.337
	NFP5	0.790					2.158
	NFP6	0.861					2.779
	NFP7	0.867					3.019
	NFP8	0.771					2.073
	NFP9	0.783					1.874

α: Cronbach's alpha; CR<sub>a</sub>: Composite reliability (rho\_a); CR<sub>c</sub>: Composite reliability (rho\_c); AVE: Average variance extracted

Source: (Author, 2023)

### Discriminant validity evaluation

Discriminant validity indicates the degree to which a construct is practically different from other constructs. Creating discriminant validity therefore necessitates that a construct be distinctive and captures phenomena that are not reflected by other constructs in the model. The heterotrait-monotrait ratio, Fornell-Lacker criterion, and cross-loadings were used to examine the discriminant validity evaluation. The HTMT explained the average value of the item correlations across constructs relative to the geometric mean of the average correlations for the items measuring the same construct. Higher values of HTMT values and, the minimum threshold value of 0.85 indicated discriminant validity problems (Henseler et al., 2015; Hair et al., 2019). The highest value of HTMT was  $0.630 < 0.85$  recommended minimum value (Table 3). The Fornell-Larcker Criterion compared the square root of the AVE values with the latent variables' correlations. The threshold was that the square root of each construct AVE was larger than its maximum correlation with any other construct. The square roots of the AVEs for the constructs met the threshold of discriminant validity (Table 3). Cross-loadings were produced by correlating the indicator scores of constructs with all other items. If the loadings of each indication were greater for its allocated build than for any other construct, and if the loadings of each construct were highest with their assigned indicators. The loadings of the indicators associated with the respective constructs loaded highest on their individual constructs than loadings on other constructs (Table 4).

**Table 3: Discriminant Validity Evaluation**

	FP	LCCA	LCFI	LCHR	LCOP	LOCD	LOP	LOPM	LOPR	LOTM	NFP
<i>Heterotrait-Monotrait Ratio (HTMT)</i>											
FP											
LCCA	0.195										
LCFI	0.412	0.113									
LCHR	0.212	0.217	0.201								
LCOP	0.107	0.137	0.130	0.136							
LOCD	0.467	0.262	0.291	0.174	0.243						
LOP	0.355	0.294	0.292	0.449	0.137	0.553					
LOPM	0.218	0.146	0.300	0.110	0.154	0.394	0.318				
LOPR	0.290	0.304	0.365	0.130	0.219	0.227	0.088	0.239			
LOTM	0.336	0.271	0.257	0.434	0.342	0.510	0.635	0.460	0.135		
NFP	0.428	0.328	0.337	0.423	0.101	0.526	0.430	0.368	0.302	0.451	

*Fornell-Larcker Criterion*

FP	<b>0.831</b>											
LCCA	0.202	<b>0.874</b>										
LCFI	0.374	0.075	<b>0.831</b>									
LCHR	0.190	0.215	0.179	<b>0.815</b>								
LCOP	-0.101	0.114	0.013	0.073	<b>0.768</b>							
LOCD	0.419	0.233	0.250	0.151	-0.157	<b>0.822</b>						
LOP	0.325	0.287	0.258	0.387	-0.096	0.476	<b>0.821</b>					
LOPM	0.206	0.129	0.260	0.033	-0.100	0.352	0.282	<b>0.802</b>				
LOPR	0.264	0.261	0.306	0.059	0.117	0.199	0.053	0.196	<b>0.801</b>			
LOTM	0.308	0.282	0.225	0.368	-0.277	0.447	0.566	0.412	0.117	<b>0.906</b>		
NFP	0.394	0.317	0.305	0.376	0.073	0.473	0.385	0.344	0.266	0.409	<b>0.818</b>	

Source: (Author, 2023)

**Table 4:** Cross Loading

	FP	LCCA	LCFI	LCHR	LCOP	LOCD	LOP	LOPM	LOPR	LOTM	NFP
FP1	<b>0.758</b>	0.088	0.288	0.129	-0.042	0.308	0.203	0.112	0.138	0.172	0.305
FP2	<b>0.815</b>	0.183	0.350	0.141	-0.077	0.330	0.206	0.188	0.250	0.245	0.320
FP3	<b>0.834</b>	0.135	0.358	0.127	-0.040	0.315	0.186	0.147	0.196	0.191	0.279
FP4	<b>0.870</b>	0.179	0.271	0.199	-0.112	0.385	0.315	0.162	0.272	0.291	0.329
FP5	<b>0.835</b>	0.168	0.310	0.170	-0.114	0.376	0.330	0.206	0.212	0.259	0.322
FP6	<b>0.870</b>	0.209	0.310	0.190	-0.074	0.337	0.299	0.149	0.233	0.301	0.352
FP7	<b>0.829</b>	0.198	0.293	0.143	-0.112	0.377	0.326	0.222	0.217	0.310	0.378
LCCA1	0.162	<b>0.909</b>	0.084	0.215	0.070	0.206	0.246	0.121	0.248	0.240	0.295
LCCA2	0.211	<b>0.900</b>	0.052	0.237	0.080	0.201	0.325	0.088	0.120	0.347	0.300
LCCA3	0.146	<b>0.863</b>	0.076	0.083	0.127	0.184	0.181	0.114	0.289	0.120	0.201
LCCA4	0.033	<b>0.791</b>	0.006	0.043	0.213	0.146	0.120	0.094	0.233	0.039	0.183
LCCA5	0.244	<b>0.902</b>	0.084	0.251	0.082	0.248	0.297	0.140	0.278	0.334	0.338
LCFI1	0.329	0.050	<b>0.841</b>	0.163	0.068	0.196	0.224	0.211	0.242	0.161	0.249
LCFI2	0.309	0.042	<b>0.808</b>	0.114	0.029	0.107	0.087	0.169	0.252	0.076	0.281
LCFI3	0.287	0.066	<b>0.868</b>	0.121	-0.080	0.190	0.235	0.242	0.302	0.237	0.193
LCFI4	0.331	-0.039	<b>0.854</b>	0.188	-0.051	0.262	0.216	0.202	0.280	0.199	0.260
LCFI5	0.289	0.200	<b>0.781</b>	0.151	0.078	0.282	0.315	0.260	0.200	0.274	0.274
LCHR2	0.126	0.198	0.041	<b>0.783</b>	0.039	0.070	0.382	-0.059	0.010	0.312	0.267
LCHR3	0.215	0.212	0.215	<b>0.874</b>	0.010	0.173	0.342	0.016	0.023	0.324	0.346
LCHR4	0.133	0.151	0.149	<b>0.874</b>	0.150	0.128	0.308	0.026	0.053	0.263	0.363
LCHR5	0.136	0.136	0.159	<b>0.716</b>	0.031	0.105	0.226	0.144	0.124	0.316	0.225
LCOP1	-0.125	0.083	-0.037	0.011	<b>0.874</b>	-0.146	-0.058	-0.103	0.106	-0.255	0.067
LCOP2	-0.069	0.065	-0.025	0.120	<b>0.779</b>	-0.214	-0.106	-0.136	0.078	-0.309	0.007
LCOP3	-0.009	0.017	0.108	0.063	<b>0.565</b>	-0.071	-0.107	-0.012	0.143	-0.167	0.050
LCOP4	-0.051	0.155	0.068	0.092	<b>0.818</b>	-0.063	-0.076	-0.038	0.067	-0.140	0.084
LOCD1	0.338	0.245	0.219	0.206	-0.022	<b>0.838</b>	0.442	0.269	0.187	0.409	0.429
LOCD2	0.386	0.220	0.222	0.108	-0.042	<b>0.867</b>	0.402	0.356	0.181	0.396	0.484
LOCD3	0.278	0.267	0.233	0.108	-0.226	<b>0.769</b>	0.355	0.258	0.220	0.313	0.273
LOCD4	0.359	0.037	0.153	0.069	-0.290	<b>0.809</b>	0.360	0.260	0.073	0.335	0.324
LOP1	0.301	0.216	0.278	0.384	-0.042	0.350	<b>0.844</b>	0.167	0.027	0.545	0.336
LOP2	0.307	0.171	0.200	0.289	-0.083	0.350	<b>0.814</b>	0.244	0.018	0.436	0.244
LOP3	0.251	0.204	0.210	0.305	-0.157	0.401	<b>0.794</b>	0.252	0.003	0.479	0.284
LOP4	0.206	0.280	0.167	0.263	-0.049	0.467	<b>0.811</b>	0.207	0.067	0.415	0.342
LOP5	0.265	0.302	0.197	0.336	-0.073	0.395	<b>0.844</b>	0.290	0.097	0.443	0.366
LOPM1	0.223	0.024	0.246	0.006	-0.169	0.296	0.129	0.769	0.262	0.348	0.268
LOPM2	0.154	0.136	0.121	0.059	0.004	0.267	0.210	<b>0.816</b>	0.138	0.282	0.311
LOPM3	0.175	0.158	0.232	0.056	-0.018	0.359	0.367	<b>0.797</b>	0.116	0.413	0.341
LOPM4	0.113	0.130	0.222	0.001	-0.071	0.228	0.264	<b>0.772</b>	0.091	0.314	0.155
LOPM5	0.128	0.067	0.227	-0.013	-0.170	0.214	0.140	<b>0.851</b>	0.154	0.260	0.234
LOPR1	0.232	0.249	0.158	0.087	0.189	0.160	0.061	0.045	<b>0.799</b>	0.064	0.203
LOPR2	0.257	0.124	0.325	-0.042	-0.054	0.243	0.018	0.191	<b>0.749</b>	0.176	0.229
LOPR3	0.149	0.160	0.322	0.082	0.132	0.074	0.021	0.214	<b>0.805</b>	0.072	0.146
LOPR4	0.178	0.295	0.188	0.082	0.138	0.121	0.066	0.191	<b>0.847</b>	0.044	0.250

LOTM1	0.278	0.266	0.196	0.345	-0.165	0.408	0.569	0.362	0.057	<b>0.917</b>	0.411
LOTM3	0.296	0.216	0.227	0.316	-0.384	0.398	0.441	0.384	0.148	<b>0.881</b>	0.325
LOTM4	0.264	0.284	0.192	0.337	-0.219	0.409	0.521	0.375	0.120	<b>0.921</b>	0.373
NFP4	0.388	0.288	0.300	0.348	0.026	0.377	0.290	0.343	0.268	0.347	<b>0.829</b>
NFP5	0.304	0.318	0.242	0.237	0.035	0.401	0.327	0.257	0.139	0.372	<b>0.790</b>
NFP6	0.276	0.283	0.215	0.354	0.030	0.390	0.347	0.269	0.198	0.377	<b>0.861</b>
NFP7	0.330	0.224	0.275	0.294	0.078	0.399	0.287	0.240	0.245	0.301	<b>0.867</b>
NFP8	0.262	0.187	0.211	0.258	0.138	0.323	0.290	0.270	0.265	0.217	<b>0.771</b>
NFP9	0.357	0.247	0.249	0.341	0.062	0.424	0.346	0.302	0.193	0.376	<b>0.783</b>

Source: (Author, 2023)

### Structural Model Evaluation

The structural model evaluated the association between exogenous constructs and endogenous constructs. The structural evaluation criterion consisted of the coefficient of determination, predictive relevance, predictive power, and the relevance of the path coefficients of the mode. The  $R^2$  measured the joint influence (variance explained) of the exogenous constructs on the endogenous constructs. The coefficient of determination evaluated the predictive accuracy, estimated as the squared correlation between a particular endogenous construct's actual and predicted values (Hair et al., 2014). The  $R^2$ -value ranged from 0 to 1 with the greater value indicating maximum level of predictive accurateness. According to,  $R^2$ -values of 0.26 or greater are deemed significant, whereas those of 0.13 and 0.02 are considered moderate and weak, respectively. In another interpretation,  $R^2$ -values at 0.75 are seen as considerable, those at or below 0.50 are regarded as moderate, and those at or below 0.25 are considered as weak (Hair et al., 2014). According to Raithel et al. 2012; Hair et al., 2014; Sarstedt et al., 2021, the  $R^2$ -value range must be interpreted in the perspective of the study at hand by considering  $R^2$  values from related studies. The study of measuring the influence of logistic capabilities and logistic outsourcing,  $R^2$ -value was within the moderate range,  $> 0.25$  according to (Hair et al., 2014). Therefore, the  $R^2$ -values of the study were satisfactory. The  $f^2$  measured the predictive significance among the associations in the model. The  $f^2$ -values were all bigger than zero (0) for reflective endogenous model indicating predictive relevance. The explanatory powers of the model were examined using PLS predict procedure. The PLS predict outperforms the naïve benchmark if the predictive value surpasses zero (Evermann and Tate, 2016). The model discovered a  $Q^2_{predict} > 0$  signifying the explanatory powers of the PLS-SEM analysis were high (Table 5 and Table 7).

**Table 5:** Predictive Power

	$R$ -square	$R$ -square adjusted	$Q^2_{predict}$
FP	0.290	0.259	0.203
NFP	0.415	0.389	0.353

Source: (Author, 2023)

**Table 6:** Influence of Logistic Capabilities and Outsourcing on Performance

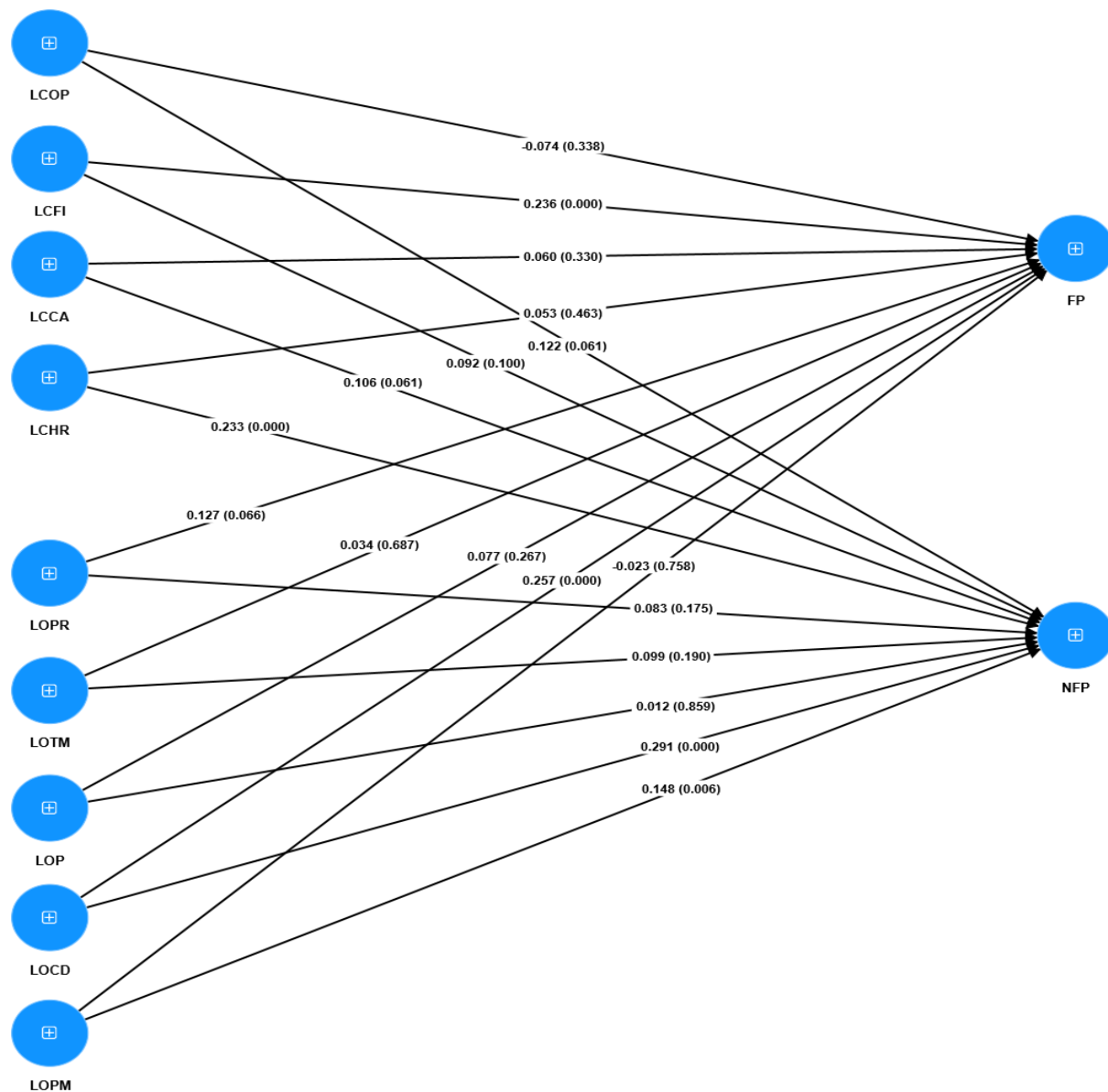
Path Direction	Coeff.	Std. Dev.	$t$ -value	$p$ -value	$f^2$
<i>Financial Performance</i>					
LCCA -> FP	0.060	0.062	0.973	0.330	0.004
LCFI -> FP	0.236	0.058	4.044	0.000	0.063
LCHR -> FP	0.053	0.072	0.734	0.463	0.003
LCOP -> FP	-0.074	0.077	0.959	0.338	0.006
LOCD -> FP	0.257	0.073	3.541	0.000	0.062
LOP -> FP	0.077	0.069	1.110	0.267	0.005
LOPM -> FP	-0.023	0.076	0.308	0.758	0.001
LOPR -> FP	0.127	0.069	1.841	0.066	0.018
LOTM -> FP	0.034	0.085	0.403	0.687	0.001
<i>Non-Financial Performance</i>					
LCCA -> NFP	0.106	0.057	1.872	0.061	0.015
LCFI -> NFP	0.092	0.056	1.646	0.100	0.012
LCHR -> NFP	0.233	0.059	3.973	0.000	0.070
LCOP -> NFP	0.122	0.065	1.876	0.061	0.021
LOCD -> NFP	0.291	0.066	4.403	0.000	0.096
LOP -> NFP	0.012	0.067	0.178	0.859	0.000



LOPM -> NFP	0.148	0.054	2.765	0.006	0.028
LOPR -> NFP	0.083	0.061	1.358	0.175	0.010
LOTM -> NFP	0.099	0.076	1.310	0.190	0.008

**Source:** (Author, 2023)

The path coefficients of the logistic capabilities that had a significant influence on financial performance was the flow of information. From the results (Table 6), the path coefficient was 0.236, the t-value of 4.044, and p-value < 0.05 showing a significant positive influence of the flow of information on organizational financial performance. This factor of logistic capabilities had an insignificant positive influence on non-financial performance. Human resources as a factor of logistic capability had a significant positive influence on non-financial performance, coefficient of 0.233, t-value of 3.973, and p-value < 0.05. Regarding logistic outsourcing, cross-docking had a significant positive influence on organizational financial performance, path coefficient of 0.257, t-value of 3.541 and p-value < 0.05. Similarly, cross-docking had significant positive influence on non-financial performance, path coefficient of 0.291, t-value of 4.403 and p-value < 0.05. Product making had significant influence on non-financial performance, coefficient of 0.148, t-value of 2.765 and p-value < 0.05. The findings showed that, logistic capabilities factors flow of information and human resources influence both financial performance and non-financial performance respectively. Cross-docking influence both financial and non-financial performance. It was observed that product marking also significantly influence non-financial performance.



**Figure 2:** Bootstrapping of Structural Model (Full Model)

Source : ( Author, 2023)

### Summary of results at reduced form level

This model contained the factors identified as significantly influencing either financial or non-financial performance or both. These variables were capital asset, human resources and flow of information for logistic capabilities and cross docking and product marking for logistic outsourcing.

From the results (Table 7), the financial performance recorded average variance of 26.8% ( $R^2$ -value of 0.268) and average variance in non-financial performance was about 39.4% ( $R^2$ -value = 0.394). The two endogenous variables' average variance explained by the joint influence of the exogenous variables were high ( $R^2$ -value  $\geq 0.26$ ).

**Table 7:** Predictive Accuracy and Power

	<i>R</i> -square	<i>R</i> -square adjusted	$Q^2$ predict
FP	0.268	0.251	0.217
NFP	0.394	0.380	0.359

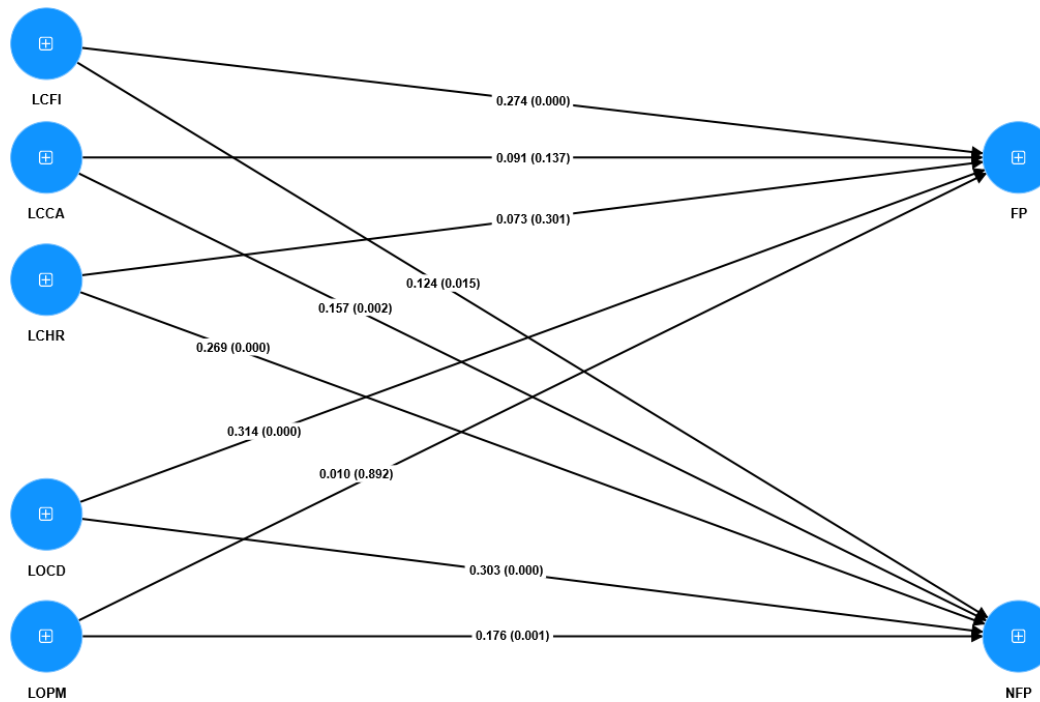
Source : ( Author, 2023)

**Table 8:** Influence of Logistic Capabilities and Outsourcing on Performance

	Coeff.	Std. Dev.	<i>t</i> -value	<i>p</i> -value	97.5% CI	$f^2$
<i>Financial Performance</i>						
LCCA -> FP	0.091	0.061	1.486	0.137	[-0.030,0.207]	0.010
LCFI -> FP	0.274	0.057	4.820	0.000	[0.165,0.388]	0.090
LCHR -> FP	0.073	0.071	1.033	0.301	[-0.074,0.208]	0.007
LOCD -> FP	0.314	0.069	4.549	0.000	[0.175,0.450]	0.109
LOPM -> FP	0.010	0.072	0.136	0.892	[-0.134,0.151]	0.000
<i>Non-Financial Performance</i>						
LCCA -> NFP	0.157	0.052	3.052	0.002	[0.060,0.257]	0.037
LCFI -> NFP	0.124	0.051	2.434	0.015	[0.021,0.222]	0.022
LCHR -> NFP	0.269	0.056	4.784	0.000	[0.151,0.374]	0.110
LOCD -> NFP	0.303	0.059	5.139	0.000	[0.182,0.415]	0.123
LOPM -> NFP	0.176	0.051	3.429	0.001	[0.077,0.281]	0.043

Source: (Author, 2023)

Table 8 presents the factors of logistic capacities and logistic outsourcing which significantly influence at least one of the organizational performances. This reduced model revealed the flow of information, a factor of logistic capabilities significantly influenced the financial performance of the organization, path coefficient of 0.274, *t*-value of 4.820, and *p*-value < 0.05. This meant improving the flow of information in the organization would significantly increase the financial performance of the organization. Cross docking from logistic outsourcing also increases financial performance, path coefficient of 0.314, *t*-value of 4.549 and *p*-value < 0.05. Logistic capabilities indicators; capital asset, flow of information, and human resources significantly influence non-financial performance of organization. From the results (Table 8), these logistic capabilities influence non-financial performance positively. It was also observed that, cross docking and product marking under logistic outsourcing influence non-financial performance significantly and positively.



**Figure 3:** Bootstrapping of Structural Model (Reduced Model)

Source: (Author, 2023)

## V. Discussion and Conclusion

This study established a base from which to extend previous related studies on logistics outsourcing, logistics capabilities as against organizational performance. Previous studies carried out to assess the impact of logistics outsourcing or logistics capabilities on organizational context, used only one of the constructs as exogenous construct in most cases. However, this study focused on joint influence of logistics capabilities and outsourcing as exogenous constructs on organizational performances. The rationale was to assess the extent to which the joint influence of the exogenous variables predicts organizational performance. To do this, the study further classified organizational performance into financial and non-financial performances. This is an important step because there were few or no existing classifications which could be used as a reference to guide decision-making on logistics capabilities and outsourcing on both financial and non-financial performance.

In the study, the influence of logistics capabilities and outsourcing on organizational performance was investigated. The estimation revealed that the path coefficients of the logistic capabilities that had a significant influence on financial performance was the flow of information including human resources, indicating significant positive influence of flow of information and human resource on organizational financial performance. This meant improving flow of information and human resources activities in the cement manufacturing organizations would significantly increase both financial and non-financial performance of the organizations. This finding is in support of the study of Konig and Spinler (2016) which established that there is positive association between logistics capability and organizational performance. This factor of logistic capabilities (flow of information) had insignificant positive influence on non-financial performance. However, human resources as a factor of logistic capability had significant positive influence on non-financial performance.

Regarding logistic outsourcing, cross-docking had significant positive influence on organizational financial performance. Similarly, cross-docking had significant positive influence on non-financial performance. Product making had significant influence on non-financial performance. This result is in support of the findings of Chen et al. 2010 which revealed that there is a positive association between logistics outsourcing and organizational performance but rejected the study of Bettise et al. (1992) which asserted that logistics outsourcing was the cause of deterioration in the overall organizational performance indicating that logistics outsourcing negatively and insignificantly influences organizational performance (Zhu et al., 2017). Cross-docking influences both financial and non-financial performance. It was observed that product marking also significantly influence non-financial performance. Cross docking from logistic outsourcing also increases financial performance. Logistic capabilities

indicators; capital asset, flow of information, and human resources significantly influence non-financial performance of organization.

The outcome of the study provides that an increase in information flow would increase cement manufacturing organization's financial and non-financial performances. The study also establishes that logistics outsourcing activities such as cross-docking promote the cement manufacturing organization's financial and non-financial performances.

Sequel to the findings, this study recommend that management of the cement manufacturing organizations should promote sound flow of information and should simultaneously increase logistics outsourcing activities in order to increase both financial and non-financial performance of the organization. It is significant to conduct a related study in another similar industry in Ghana so as to relate the outcomes for any relationships and changes. A comparative investigation in another emerging economy specially an Africa country could also aid shed light on the critical success factors and complexities. This research can be repeated after some period for 4 years in order to find out whether there are variations to the preceding discovery.

### **Implications**

Effective flow of information improves internal integration of stakeholders' collaboration which gives birth to win-win approaches. Hence, contributing to cost reduction, and improved financial and non-financial performances where the sharing of information fosters transparency leading to strengthening ties with suppliers, distributors, and customers. The findings of this study provide vital general suggestions for cement organizations practicing logistics outsourcing. Many theoretical bases predict positive opportunities from logistics outsourcing. Our findings revealed that the path coefficients of the logistic capabilities that had a significant influence on financial performance were the flow of information including human resources, a rise in information flow shows a rise in organizational performance. This suggests an important message to practitioners and managers of logistics capabilities and outsourcing that improving the flow of information and human resources activities in cement manufacturing organizations would significantly increase both the financial and non-financial performance of the organizations

Drawing from above, the result of this study might serve as the rudiment for effective and efficient information flow within the supply chain of the stakeholders of the industry, to improve product qualities, distribution, service, and satisfaction of the customers. The result functions as a guide to management to overcome the difficulty of dealing with product issues. The expectation was the capacity of the result to inform management to modify practices for an improved information flow. Furthermore, policymakers on the execution of the routine responsibilities of the firm will be informed to ensure drafting policies concerning the timely use of information flows to the benefits of each of the stages within the supply chain.

### **Implication for Social Change**

Understanding acquired from the findings of the study equipped management to maximize employment rate for the citizenry. This is a result of attempting to implement empirical suggestions outlined about the findings into practice. This could be achieved through the use of information flow. A rise in information flow will increase the financial and non-financial performance of the organization with its associated high production, revenue generation, and profitability. An increase in the financial and non-financial performance of the organization shows the capacity to generate high revenue that enables the creation of sustainable jobs for society. Sustainable employment might create and increase the living standards of families, and communities. Creating jobs is synonymous with preventing social vices such as kidnapping, prostitution, and cybercrime among others. Furthermore, the provision of social amenities such as schools, water, and hospitals could be built as a social responsibility of the organization, since things had improved financially and non-financially.

### **Limitations and call for Future Research**

Longitudinal studies could be carried out to ascertain permanent practices of the cement manufacturing companies that are of no benefit to them. The sample size could be increased such that the probability of representation may not be doubted. The users of the product views could be significant in making scientific analyses for decision-making. Future researchers should do a rigorous investigation on Ghana's cement industry's supply chain capabilities in the areas of sourcing and personnel. The recent closure of some cement manufacturing companies in Ghana should be a worry to the academics to establish a full investigation to ascertain the causes and the way forward, this study should cover the entire supply chain of the organization(s) using a case study preferably.

### Competing interest statement

All the authors have no competing conflict of interest

### Author (s) Contribution Statement

Enoch Dotse Agbandzo contributed to the conception and design of the study. Enoch Dotse Agbandzo, Mathew Quayson, Jewel Dela Novixoxo, and Constance Buah wrote the introduction and literature sections. Joseph Kwasi Agbeka, Eric Asamoah, Enoch Dotse Agbandzo, and Maxwell Edem Azila-Gbetteor organized the database, performed the statistical analysis and interpretation of the results. Mathew Quayson, Maxwell Edem Azila-Gbetteor, Enoch Dotse Agbandzo, Jewel Dela Novixoxo, and Constance Buah fit the study according to the academic structure. All authors contributed to the manuscript revision, read, and approved the submitted version.

### Ethical consideration

This research ensured ethical consideration before, during, and after the collection of the data, where formal consent was sought from each participant. The participants were duly informed of the right to participate in the study making participation voluntary. Therefore, indicating the consciousness to participate voluntarily and the right to withdraw. Confidentiality of personal matters and data collected was duly adhered to. The study received approval from the University's (Ho Technical University) publication and ethics committee review. This was under protocol number SSR/2022-105, and adhered to the guidelines outlined in the Declaration of Helsinki for research involving human subjects.

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