Asian Advantage: Leveraging Logistics for Peak Performance in Efficiency, Effectiveness, Cost, Quality, and Differentiation

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Abstract

The significance of logistics administration in the contemporary, fast-paced business environment has significantly transformed the way organizations operate. This study investigates the interconnected impacts of logistics efficacy, efficiency, cost, quality, and differentiation on the performance of businesses. An in-depth analysis is employed to examine the effect of various logistics management facets on the financial and operational outcomes of a business. Efficient logistics assesses the functionality of supply chains through the optimization of resources and the refining of processes, whereas successful logistics evaluates the ability to promptly and precisely fulfill consumer demands. Through the consideration of both direct and indirect costs, logistics cost analysis assesses the financial impact of logistics operations. Logistics quality examines the reliability, security, and precision of logistical processes, whereas logistics differentiation explores the ways in which unique logistical strategies set an organization apart from its competitors. The objective of this study is to examine the intricate relationships among various performance metrics and these logistics variables. To achieve this, empirical research and statistical modeling are utilized. With the intention that they will assist managers in making more informed decisions and guide businesses toward enhancing their logistics management procedures so that they may flourish in a dynamic marketplace. In order to thrive in the contemporary global marketplace, businesses must recognize the criticality of logistics in shaping organizational results and devise strategies to capitalize on the synergies that exist between these components.

Keywords: logistics, administration, contemporary, organization, variables.

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INTRODUCTION

The work of Yingfei et al. (2022) in the literature of logistics research shows that logistics performance has influence on firm efficiency. In addition, Naclerio et al., (2022) other empirical evidence demonstrated the influence of logistics executions on firm’s success. Council of Logistics executives specified that logistics is component of the supply chain frameworks, which plans, carries out and controls efficient, efficient forward and reverse flow and storage between the point of origin and the point of consumption, as well as associated information between the goods and services for the fulfillment of customer obligations or needs. In the past, logistics targets are largely related to cost efficiency. The price remains an important factor in competition as a result of costs, but additionally businesses want to shorten delivery times, improve shipping rate and reaction, and ensure shipment arrives on time. According to Logistics Pushpamali et al. (2021), is not simply a "saving money" process; it is an important element of a customer service plan. In 2005
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defines Logistics management consists of a supply chain management aspect utilized to fulfill clients demands by preparing, efficient surveillance and enforcement, traffic and storage from source to destination of related information, goods and services (Ben-Daya et al., 2020). In (Gossaye, 2017) Logistics management goal is to bring the right goods or services to the right place at the right moment, and in the best possible state with the minimum price also the greater degree of investment backup but with actual client pleasure. From their own point of view, the organization will improve its competition strategies and logistics factors.

According to Mendes, et al, Poor logistics planning gradually increases costs and the implementation of an ineffective logistics system can cause problems. Organizations must be act upon best processes in logistics management in order to solve these problems. Organizations should concentrate on team work rather than competition. Good cooperation between suppliers of transportation, consumers and vendors helps to reduce costs. For business success, an effective and safe transportation provider is also essential. The study titled "The effect of logistics performances on organizational performance" Morgan (2018) was conducted intentionally to answer questions which lead to improved logistics performance by a supply chain emphasis, and which in turn lead to improved organizational performance?

LITERATURE REVIEW

Measuring the logistics performance has become a top priority, despite an enhanced knowledge of the strategic impacts of logistics in order to boost client loyalty (Burity, 2021). In this research the dependent variable was organizational execution, it was known as contingent because the performance of any firm relied on several different types called independent variables. In this scenario, the main drivers contributing to logistical success included independent variables: logistics effectiveness, logistics quality, logistics efficiency, logistics differentiation and logistics cost. Logistics is the method of arranging, starting to introduce and overseeing processes for the efficient and trustworthy transportation and stockpiling of items and commodities, as well as relevant material, from the juncture of production to the spot of ingestion.

In order to satisfy client needs, that also includes incoming, offsite, inner, and outer actions (Golroudary et al., 2015). Logistics management assists associations to minimize costs and maximize customer service (Langenwalter, 2020). The Logistics Management Council (CLM) has reported. In order to maximize current and future productivity by economic order fulfillment, logistics management is the mechanism to handle the purchase, transfer, and storage of products, components and finished stock throughout the enterprise through its marketing networks (Tien et al., 2019). A common feature of recent logistics concepts is the mechanism by which products and resources are transported and handled from beginning to finish production, distribution and waste disposal, with the goal of pleasing customers and bringing productivity to industry (Moons et al., 2019).

General Objectives

1. The main objective of this study is to investigate the impact of logistics performance on firm’s performance.
The Specific Objectives

1. To examine the impact of logistic quality, logistic cost and logistic differentiation on the firm performance.
2. To examine logistic effectiveness and logistic efficiency on the relationship between logistic quality, logistic cost and logistic differentiation and the firm performance.

CONCEPTUAL FRAME WORK

It is often the case that a company’s success or failure in today’s highly competitive business environment comes down to how well it manages its logistics. This is especially true of global companies. The process of planning, organizing, and controlling the flow of materials and information from the point of production to the point of final use is referred to as logistics management (Hofmann et al., 2017). Logistics management encompasses a wide variety of subfields, including shipment and storage management, inventory control, order processing, and customer service. Better management of these functions can lead to improvements in a variety of metrics, including increased profitability, increased market share, increased customer satisfaction, and increased competitiveness (Schiemann et al., 2018).

This literature review’s objective is to investigate the connections between the various logistics factors and the effects those factors have on the outcomes of businesses. We are going to concentrate on the connections that exist between logistical costs, points of differentiation, product quality, productivity, and the overall performance of the company.

Logistic Cost and Firm Performance

A crucial component of logistics management is the management of the costs that are associated with the operations of the logistics chain. Previous research has demonstrated that efficient cost management in the company’s logistics operations is essential to the success of the business (Sebastian et al., 2017). One strategy that can be utilized by a business in order to improve its bottom line is to reduce the amount of money that is spent on logistics. This can have a beneficial impact on profits by reducing the costs of production and shipping. Also, in price-sensitive markets, companies that have efficient logistics cost management have a better chance of increasing their market share (Ahmadi-Javid et al., 2015).

Numerous studies have found a correlation between increased logistic costs and lower levels of productivity. For example, the research conducted by Ali et al. (2019) demonstrates that there is an inverse correlation between the costs of logistic operations and the success of businesses. That is to say, businesses that are required to pay a higher amount for logistics typically do not achieve the same level of success. Chatterjee et al. (2015) discovered that lowering logistics costs can assist in increasing market share, which is another indicator of a company’s level of success.

Logistic Cost and Logistic Effectiveness

Efficiently managing logistics operations is contingent upon the timely and cost-effective delivery of products and services to customers. Georgsson et al. (2016) The quantification of logistics task efficiency is accomplished through the utilization of a metric referred to
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as "logistics effectiveness," which is subject to the influence of the monetary resources allocated towards said tasks. According to the study conducted by Wang and Zhao (2014) there exists a significant association between the amount of money spent on logistics and the level of performance achieved. Khan et al. (2020). The research findings indicate that there exists a positive correlation between the enhancement of logistics process efficiency and a decrease in logistics expenses. The aforementioned discovery implies that organizations possessing robust logistics cost management competencies are inclined towards having effective logistics operations, thereby potentially enhancing the financial performance of the company.

Logistic Cost and Logistic Efficiency

Businesses are able to maximize output while simultaneously reducing the amount of input they require when they have efficient logistics management. The price tag associated with logistics is a significant factor in determining how productive logistics functions are. According to Kumar et al. (2020) the findings of research, there is a connection between the amount spent on logistics and an organization's level of productivity. The findings of the study indicated, in particular, that a reduction in logistics costs has a positive correlation with an improvement in the efficiency of logistics operation. According to this finding, businesses that have a superior cost management system for their logistics are more likely to have logistical operations that contribute to the overall performance of the firm (Macharia Ngombo Wilson et al., 2015).

Logistic Differentiation and Firm Performance

In the business of logistics, one strategy for differentiating oneself from competitors is to offer services or capabilities that they cannot match. The ability to differentiate oneself from competitors has the potential to be a significant source of competitive advantage and improved firm performance. Researchers Ali et al. (2019) discovered that a significantly positive correlation exists between logistic differentiation and firm performance. In particular, the study revealed that businesses which operated their logistics in a unique manner performed significantly better than their peers. According to this finding, businesses that successfully differentiate their logistics operations from those of their competitors have a greater chance of achieving commercial success (Cohen et al., 2013).

Logistic Differentiation and Logistic Effectiveness

The ability to differentiate between different types of logistics can also contribute to the effectiveness of various logistics procedures. Hong et al. (2017) discovered that there is a significant link between the level of logistical specialization and the level of operational effectiveness. To be more specific, the research suggests that businesses operating in the logistics industry that are better able to differentiate themselves from their competitors are more likely to be successful. When we talk about the ability to provide differentiated capabilities or services in the realm of logistics, we are referring to what we mean by the term "logistical differentiation." Businesses can gain a competitive advantage in the market by differentiating themselves from their rivals in the industry and by offering something of value to their clientele (Mustafa, et al., 2015). According to the research,
According to a number of studies, a company's ability to distinguish its own logistics operations from those of its rivals is directly correlated with that business's level of successful logistics performance. According to the findings of one study, Wang (2016) businesses that offer differentiated logistics services such as same-day delivery or bespoke logistics solutions are more likely to have efficient logistics operations. Businesses have a tendency to perform better when they are able to satisfy the needs of their customers in a more effective and efficient manner.

In a manner analogous to this, Khalidi and Chaharsooghi (2013) discovered that increasing the level of logistical specialization led to increased logistics efficiency, which in turn led to improved business results. Companies that were able to differentiate themselves from their rivals in their logistics operations exhibited superior performance in the area of logistics. These companies had shorter delivery times and lower overall logistics costs, among other advantages (Attaran, 2017). Two outcomes that may result from such performance are increased market competitiveness as well as increased levels of customer satisfaction.

Logistic Cost -> Logistic Efficiency -> Firm Performance

The amount of money that is spent on logistics-related activities such as transporting, storing, and processing is what is meant to be referred to as "logistics costs." According to the research that has been done, it is possible for a company to improve its performance by decreasing its logistics costs and increasing the efficiency of its logistics operations. (Hugos, 2018).

Businesses that have mastered the art of cost management are more likely to have logistics operations that are efficient. According to the findings of a study conducted by Lee and Kim (2017) for instance, businesses with effective logistics operations were those that were able to cut costs associated with logistics by employing strategies such as shipment consolidation and the utilization of transportation modes that were less expensive. Businesses typically see improvements in their overall performance whenever they are able to cut costs and make their operations more efficient (Popović et al., 2018).

In a similar vein, Younis, et al. (2016) discovered that improved logistics performance can result in improved firm performance if better logistics cost management is implemented. Gani (2017) A better logistics performance was found to be associated with companies that were able to keep their logistics costs under control. This was found to be the case for both faster delivery times and higher service levels. If businesses are better able to meet the demands of their customers and streamline their operations as a result of this improvement, then the performance of the firm may improve.

Logistic Quality -> Logistic Efficiency -> Firm Performance

When we talk about the quality of logistics services, we are referring to things like timely delivery, accurate orders, and high-quality goods as examples of what we mean by that phrase. According to the findings of the research, an organization's bottom line can
According to the research in this field, increased logistic quality is typically accompanied by increased operational productivity within the logistics sector. According to the findings of a study conducted by Lee et al. (2019) for instance, businesses that implemented quality-enhancing measures such as process improvement and quality control saw an increase in the efficiency of their logistics operations. Businesses typically have higher levels of success when they are better able to satisfy the needs of their customers and cut down on waste.

In a similar vein, a study that was conducted by Kuo et al. (2017) found that improved logistics performance can boost firm performance. According to the findings of this research, Christopher (2018), one of the benefits obtained by businesses that worked to improve their logistic quality was a reduction in the amount of time it took to complete deliveries and an increase in the level of service provided to customers. If businesses are better able to meet the demands of their customers and streamline their operations as a result of this improvement, then the performance of the firm may improve. The importance of effective logistics management is increasingly being recognized by successful businesses today. The level of customer satisfaction, the costs of operations, and the gains made financially are all influenced by logistics management. This literature review will center on the relationship between costs associated with logistics and outcomes such as increased profitability and a distinct advantage over other businesses.

Logistics Cost -> Logistics Effectiveness -> Firm Performance:

A number of studies have found that the proportion of a company's revenue that is spent on logistics is inversely related to that proportion. If a company's logistics costs are too high, it may experience a negative impact on both its bottom line and its ability to compete successfully in the market. There is a correlation between the degree to which a company's logistics are successful in meeting the requirements of its clients and the level of financial success that the company enjoys (Dai et al., 2015). Companies that are successful in satisfying the needs of their customers for logistics services are typically successful in other areas as well. Choi et al. (2015) for example, investigated the effects of logistics costs and logistics effectiveness on the performance of Korean manufacturing companies. The authors came to the conclusion that while company performance was negatively impacted by logistics costs, it was positively impacted by logistics efficiency. According to the findings of research carried out by Wu and Dunn (1995) the logistics costs incurred by companies in the United States trucking industry had a negative impact on the profitability of those companies.

Logistics Quality -> Logistics Effectiveness -> Firm Performance

The quality of the firm's logistics, which includes the reliability and timeliness with which goods are delivered, has been shown to have a positive correlation with the performance of the company. In most cases, increased levels of customer satisfaction with a company's logistics services directly correlate to an increase in the volume of the company's business as well as the amount of money in its bank account (Veloso et al., 2020). An et al. (2016), for example, investigated the connection between the quality of
the logistics, the effectiveness of the logistics, and the performance of the firms operating in China’s logistics sector. The authors of the study came to the conclusion that there is a causal connection between the quality of logistics, the effectiveness of logistics, and ultimately, firm performance. In a similar vein, Huang et al. (2017) found that customers in Taiwan’s online retail sector who had better experiences with the company’s logistics were more satisfied and loyal overall.

Logistics Differentiation -> Logistics Efficiency -> Firm Performance:

There is a correlation between differentiation in logistics, which refers to the ability of logistics management to provide differentiated services, and increased effectiveness in logistics, as well as improved bottom-line results for companies. Companies that are able to differentiate themselves from their competitors by providing superior logistics services typically outperform their peers in terms of financial performance.

For example, Chen et al. (2017) investigated how distinguishing logistics, logistics efficiency, and firm performance all play a part in China’s logistics industry. According to the findings of the authors, the authors found that when companies focused on differentiating their logistics, it increased the efficiency of their logistics, which in turn increased the success of the companies. Similarly, Yuen et al. (2019) found that differentiating one’s business through logistics led to increased levels of customer satisfaction as well as customer loyalty in Taiwan’s logistics industry.

According to the research that has been conducted, effective logistics management is absolutely necessary in order to improve business results. Productivity can be increased through improvements in logistics efficiency, quality, and differentiation; however, logistics expenses can have a dampening effect on the success of a company (Swink et al., 2015). Increased customer satisfaction, product sales, and overall net profit are typical outcomes for companies that perform exceptionally well in the provision of logistics services. The practices that businesses use to manage their logistics should be worked on to improve in order for these businesses to be more productive and competitive (Christopher et al., 2012).

Figure 1.
Conceptual Framework
HYPOTHESIS

H1: Logistic quality has significant impact on the firm performance
H2: Logistic quality has significant impact on the logistic effectiveness
H3: Logistic quality has significant impact on the logistic efficiency
H4: Logistic cost has significant impact on the firm performance
H5: Logistic cost has significant impact on the logistic effectiveness
H6: Logistic cost has significant impact on the logistic efficiency
H7: Logistic differentiation has significant impact on the firm performance
H8: Logistic differentiation has significant impact on the logistic effectiveness
H9: Logistic differentiation has significant impact on the logistic efficiency.
H10: Logistic effectiveness has significant impact on the firm performance.
H11: Logistic efficiency has significant impact on the firm performance.
H12: Logistic effectiveness mediates between the logistic quality has significant impact on the firm performance.
H13: Logistic effectiveness mediates between the logistic cost has significant impact on the firm performance.
H14: Logistic effectiveness mediates between the logistic differentiation has significant impact on the firm performance.
H15: Logistic efficiency mediates between the logistic quality has significant impact on the firm performance.
H16: Logistic efficiency mediates between the logistic cost has significant impact on the firm performance.
H17: Logistic efficiency mediates between the logistic differentiation has significant impact on the firm performance.

METHODOLOGY

Methodology defines the process of conducting the research and finding the results in a systematic way. In this research, we use the quantitative research approach to test the hypothesis and extract the answer. We have applied descriptive research design that will represent the point of views of each and every individual in a research target population. We used cross-sectional field surveys to collect data and used various techniques and statistical methods to analyze data.

PLS-SEM ANALYSIS

Researchers now have access to a flexible and comprehensive method of modelling their data with SEM-PLS, which is also a powerful instrument for analysing the intricate
relationships that exist between the variables being studied. First, the latent variables and their observed indicators must be defined. Next, the validity and reliability of the measures that are used to operationalize the latent variables must be evaluated. Finally, the results of the study must be interpreted. This phase is essential because it prepares the groundwork for the subsequent analysis and ensures that the latent variables are measured accurately. As a result, this phase is critical. The second phase of the process involves putting the hypothesized relationships between latent variables in the structural model to the test by means of a process that involves both specification and evaluation. It is essential for scientists to be able to do this because it enables them to test their hypotheses and investigate the interactions that occur between the various factors. Metrics such as goodness of fit, R2 values, and path coefficients are examples of some of the metrics that are typically utilized in the process of evaluating the structural model. It is essential to keep in mind that SEM-PLS is an iterative process; consequently, both the measurement model and the structural model will be evaluated and refined in accordance with the requirements of producing a model fit that is satisfactory. Alterations are made to the model in order to get it to the point where it fits the requirements satisfactorily. These modifications may involve altering the relationships between the variables, shifting the indicators or latent variables, adding or removing variables, or shifting the indicators or latent variables.

**Data Types And Forms**

Data can be obtained from either primary or secondary sources. We use primary data to conduct our research. We carried out a questionnaire-based survey to identify our objectives and try to achieve them. The data is categorized and analyzed by using specific statistical tools and techniques. A questionnaire is the best source to calculate and quantify against the variables.

**Target Population**

Target population is known as the unit of analysis, and our target population will be the employees working in the food chain in Punjab. The firm's that are targeted are food chains in Pakistan. The data is collected from the target population is comprised of logistics performance, Logistics effectiveness, Logistics efficiency, Logistics quality, logistics differentiation and Logistics cost. Respondents were the managers from the food chain that manage the logistics part of the firm.

**Sampling Procedure**

Data can be gathered from two greater kinds of sampling methods that are probability sampling and non-probability sampling. In this examination, we implement non-probability sampling of the data gathering process that this examination is a quantitative measurement. The snow ball sampling method is being utilized in this study because the convenience sampling method is a kind of non-probability in which sample is being gathered from the area of the populace that is commonly available.

**Data Collection & Timing**

In this research the data collection method can be biased because to some extent, the sample cannot generalize to the population which can create errors in analysis. Different
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Factors are taken into consideration in the collection of data, including time, cost and facing other difficulties while collecting data. In this research, we introduce questionnaire for the data collection from respondents which is cost effective and accessible. It has taken 4 weeks in collecting data phase. Our target was to take respond from 250 managers from which 200 have responded.

Instrumental Development

There are many instruments that can be used to collect data in quantitative approach like interviews, web-based survey and structured questionnaire. We adapted questioner that shown in table 3.12. Five Likert scale multiple options questionnaires is used which is easy for the respondent to respond. The data is collected through questionnaire from the employees of the various food firms across Punjab, Pakistan.

MEASUREMENT MODEL

At the beginning of the SEM-PLS process, the measurement model, the latent variables (variables that are not directly observed), and their indicators (variables that are directly observed) are all defined. The precision and accuracy of the instruments that were utilised in the process of quantifying the latent variables are assessed by the measurement model. It is possible to make use of both reflective and formative indicators. Formative indicators are indicators that contribute to the formation of a construct, as opposed to reflective indicators, which merely reflect what already exists in the construct. The measurement model can be evaluated based on a variety of criteria, some of which include internal consistency, convergent validity, and discriminant validity. Internal consistency is essential.

Figure 2.
Measurement Model
The degree to which outer loadings in SEM-PLS exceed a given threshold is highly dependent on both the context and the goals being pursued. However, in general, it is best if the outer loadings are sufficiently high to guarantee that the observed indicators are measuring the intended latent variables. This can be accomplished by ensuring that the outer loadings are sufficiently high. Acceptable outer loadings in SEM-PLS are typically defined as those with a value of 0.70 or higher. However, there are some exceptions to this rule. This cutoff guarantees the reliability and validity of the measurements by ensuring that the observed indicators have a strong relationship with the latent variables that are desired. As a result, the reliability and validity of the measurements are guaranteed. The minimum outer loadings that are acceptable, on the other hand, are subject to change depending on the complexity of the model and the number of latent variables.

In certain circumstances, lower outer loadings might still be considered acceptable as long as they are in accordance with the theoretical expectations and the overall model fit. Because both FP2 and FP5 have loadings that are less than 0.70, they have been excluded from the analysis. An essential component of SEM-PLS is the process of evaluating the validity of the measures that were used to operationalize the latent variables. In SEM-PLS, some of the most common reliability indicators include Cronbach’s alpha, composite reliability ($\rho_a$), composite reliability ($\rho_c$), and average variance extracted (AVE). Cronbach’s alpha is a measure of internal consistency that gives an estimate of the correlation between the various observed indicators of a latent variable. This estimate can be used to evaluate the reliability of the data. The value of Cronbach’s alpha can range from 0 to 1, with higher values indicating more trustworthy data. Although a value of 0.7 or higher for Cronbach’s alpha is generally accepted as satisfactory, this threshold can shift depending on the type of research being conducted and the number of variables that are being evaluated. Composite reliability is a more accurate measure of reliability than other types of reliability because it takes into account the covariance that exists between the latent variable and the observed indicators in addition to the unique variance that exists in the observed indicators. The $\rho_a$ and $\rho_c$ composite reliability estimates are two of the most common ones used in SEM-PLS. On both of these scales, the range of possible values is from 0 to 1, with higher scores indicating a greater degree of dependability. It is commonly held that the composite reliability estimate, denoted by $\rho_c$, possesses greater precision and accuracy than its analytic counterpart, denoted by $\rho_a$.

The average variance extracted (AVE) is another indicator of reliability that can be used to quantify the amount of variation in the observed indicators that can be attributed to the latent variable. This indicator measures the amount of variation in the observed indicators that can be attributed to the latent variable. Higher AVE values, which can range anywhere from 0 to 1, are indicative of an increased degree of dependability. In most cases, researchers aim for an AVE of 0.5 or higher; however, the specifics of this target can change depending on the type of study being conducted and the number of indicators that are being monitored. In SEM-PLS, a reliability analysis needs to be performed on each latent variable as well as the observed indicators that are associated with it. Alongside the findings of the reliability analysis, other measures of model fitness, such as the goodness of fit index, the root mean square error of approximation, and the cross-loadings of the observed indicators, should be reported. Researchers can improve
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the precision and credibility of their SEM-PLS analysis by conducting a reliability analysis on their measures to ensure that they are consistent and free of random error. This will allow the researchers to determine whether or not their results can be trusted. The findings of the study's reliability analysis are presented in Table 4.2 below.

Table 1.
Outer Loading

<table>
<thead>
<tr>
<th>Firm Performance</th>
<th>Logistic Cost</th>
<th>Logistic Differentiation</th>
<th>Logistic Effectiveness</th>
<th>Logistic Efficiency</th>
<th>Logistic Quality</th>
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Table 2.
Reliability Analysis

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<th>Composite reliability (rho_c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Performance</td>
<td>0.947</td>
<td>0.949</td>
<td>0.958</td>
</tr>
<tr>
<td>Logistic Cost</td>
<td>0.902</td>
<td>0.902</td>
<td>0.939</td>
</tr>
<tr>
<td>Logistic Differentiation</td>
<td>0.923</td>
<td>0.925</td>
<td>0.946</td>
</tr>
<tr>
<td>Logistic Effectiveness</td>
<td>0.926</td>
<td>0.927</td>
<td>0.944</td>
</tr>
<tr>
<td>Logistic Efficiency</td>
<td>0.943</td>
<td>0.944</td>
<td>0.955</td>
</tr>
<tr>
<td>Logistic Quality</td>
<td>0.935</td>
<td>0.937</td>
<td>0.953</td>
</tr>
</tbody>
</table>

The Fornell-Larcker criterion is frequently utilised in SEM-PLS as part of the practise of evaluating discriminant validity. One of the ways in which the discriminant validity of a latent variable can be evaluated is by observing how well it differentiates itself from the model’s other latent variables. In other words, it ensures that different measures are not used to operationalize the same underlying construct for different latent variables in the model. This can be thought of as a form of redundancy prevention. The square root of the average value of each latent variable is compared to the correlation coefficients
among the latent variables using the Fornell-Larcker criterion. The Fornell-Larcker criterion states that discriminant validity has been demonstrated when the square root of the AVE for a given latent variable has a value that is greater than the correlation coefficient that exists between that latent variable and any other latent variable in the model. The results of the discriminant analysis are presented in the table 4.3 that can be found below.

### Table 3.
**Fornell-Larcker criterion**

<table>
<thead>
<tr>
<th></th>
<th>Firm Performance</th>
<th>Logistic Cost</th>
<th>Logistic Differentiation</th>
<th>Logistic Effectiveness</th>
<th>Logistic Efficiency</th>
<th>Logistic Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Performance</td>
<td>0.890</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Logistic Cost</td>
<td>0.854</td>
<td>0.885</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logistic Differentiation</td>
<td>0.706</td>
<td>0.816</td>
<td>0.872</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logistic Effectiveness</td>
<td>0.739</td>
<td>0.883</td>
<td>0.821</td>
<td>0.879</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logistic Efficiency</td>
<td>0.723</td>
<td>0.767</td>
<td>0.889</td>
<td>0.700</td>
<td>0.882</td>
<td></td>
</tr>
<tr>
<td>Logistic Quality</td>
<td>0.699</td>
<td>0.762</td>
<td>0.789</td>
<td>0.705</td>
<td>0.744</td>
<td>0.815</td>
</tr>
</tbody>
</table>

### STRUTRUAL MDOEL

After the measurement model has been established, the structural model then needs to have its parameters estimated. The structural model, which is presented in the form of a set of equations, elucidates the hypothesised associations between the latent variables that are being modelled. Several different metrics, such as the goodness of fit, R2 values, and path coefficients, can be utilised in order to perform an analysis on the structural model. The R2 values of each latent variable represent the amount of variance that they explain, while the goodness of fit measures how well the observed data fit the model. The path coefficients are a reflection of both the direction and the strength of the connections that exist between the latent variables. The capability of SEM-PLS to analyse complex relationships between variables is useful to researchers in a variety of fields, including the social sciences, business, and engineering, amongst others. SEM-PLS is a tool that can help researchers better understand the interrelationships between variables, put theoretical models to the test, and identify areas where more research is needed.

![Structural Equation Model](image)
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Table 4.
SEM-PLS

|                                | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | T (|O/STDEV|) | P values |
|--------------------------------|---------------------|-----------------|----------------------------|------------|----------|
| Logistic Cost -> Firm Performance | 0.185              | 0.184           | 0.111                      | 1.675      | 0.094    |
| Logistic Cost -> Logistic Effectiveness | 0.156              | 0.156           | 0.074                      | 2.096      | 0.036    |
| Logistic Cost -> Logistic Efficiency | 0.197              | 0.199           | 0.130                      | 1.511      | 0.131    |
| Logistic Differentiation -> Firm Performance | 0.424              | 0.418           | 0.133                      | 3.197      | 0.001    |
| Logistic Differentiation -> Logistic Effectiveness | 0.446              | 0.443           | 0.105                      | 4.236      | 0.000    |
| Logistic Differentiation -> Logistic Efficiency | 0.431              | 0.426           | 0.155                      | 2.782      | 0.005    |
| Logistic Effectiveness -> Firm Performance | 0.183              | 0.191           | 0.053                      | 3.413      | 0.001    |
| Logistic Efficiency -> Firm Performance | 0.795              | 0.787           | 0.054                      | 14.683     | 0.000    |
| Logistic Quality -> Firm Performance | 0.136              | 0.143           | 0.091                      | 1.497      | 0.134    |
| Logistic Quality -> Logistic Effectiveness | 0.370              | 0.372           | 0.090                      | 4.122      | 0.000    |
| Logistic Quality -> Logistic Efficiency | 0.086              | 0.091           | 0.103                      | 0.842      | 0.400    |

DIRECT RELATIONSHIPS

The structural model of SEM-PLS incorporates a wide variety of significant connections, such as those between logistic cost and effectiveness, between logistic quality and effectiveness, between logistic differentiation and firm performance, between logistic differentiation and effectiveness, between logistic differentiation and efficiency, and so on (table 4.4). Because of the high degree of correlation that exists between the two factors, reducing the costs associated with logistics is likely to result in positive outcomes for the gains in efficiency that are sought. This finding is consistent with what we already know from other research about how important it is to keep an eye on costs when conducting logistics operations. A company’s bottom line can benefit from increased efficiency in its logistics operations, which in turn leads to lower overall costs for the company’s logistics.

As a result of the high degree of correlation that exists between the two, improving the quality of logistical processes is likely to have a constructive effect on efficiency as well. These results lend credence to the notion that quality management is an extremely important component of logistics operations. It follows from this that companies that are able to improve the quality of their logistics operations will also have logistics operations that are more effective, which, in turn, can improve the performance of the company. As a result of the strong correlation that exists between logistical differentiation and firm performance, businesses that are better able to distinguish themselves from their rivals and stand out from the crowd by differentiating their logistics operations are more likely to be successful. These findings lend credence to the notion that differentiating oneself from the competition can result in a competitive advantage. Based on these findings, it
appears that businesses that offer specialised logistics services or capabilities have a distinct advantage over their rivals.

Because there is such a strong connection between the two, it stands to reason that differentiation can also increase the efficiency of logistical processes. This result is consistent with the theory that a company’s performance can improve across the board if its operations are segmented. In other words, this result supports the theory. It seems to imply that businesses that are able to differentiate themselves in the field of logistics are more likely to have efficient logistics operations, which, in turn, can boost the bottom line of the company.

Given the substantial correlation that exists between differentiation and efficiency in logistics, it is reasonable to hypothesise that the latter can be improved by the former. This finding is consistent with the theory that increasing a company’s strategic differentiation can lead to improvements in the operational efficiency of that company. It is hypothesised that businesses that are able to differentiate their logistics operations will also have logistics operations that are more efficient, which, in turn, will improve the performance of the company. Because of the close connection that exists between the two ideas, enhancing the efficiency of the firm's logistical processes appears to be of the utmost importance for improving overall performance.

This result is consistent with the idea that logistics operations are a critical factor in companies' overall success. It suggests that companies that have logistics operations that are run more effectively are more likely to have successful operations overall. Given the significance of the connection between logistic efficiency and firm performance, it follows that increasing the former is essential to increasing the latter. This finding is consistent with the hypothesis that the logistics operations of a company represent a significant opportunity for cost reduction. It suggests that companies that have logistics operations that are more efficient will have higher levels of firm performance overall. When viewed as a whole, the significant paths of the SEM-PLS model emphasise how important it is to have good logistics management in order to increase the efficiency of a business.

According to the findings, companies will be able to outperform their competitors if they take measures to reduce logistics costs, improve logistics quality, differentiate logistics operations, and increase logistics efficiency and effectiveness. There are significant repercussions that can be drawn from these findings for managers and policymakers who are interested in improving firm performance through better logistics management. In the SEM-PLS model, important pathways include Logistic Quality, Logistic Effectiveness, and Firm Performance. Other important pathways include Logistic Differentiation, Logistic Efficiency, and Firm Performance (table 4.5). As shown by the significant path from Logistic Quality to Logistic Effectiveness to Firm Performance, increasing the quality of logistics operations may result in an increase in logistic effectiveness, which may ultimately lead to improved firm performance. These results lend credence to the notion that quality management is an extremely important component of logistics operations. It follows from this that businesses that are able to improve the quality of their logistics operations will also have logistics operations that are more effective, which, in turn, can improve the performance of the business. As shown by the significant path from logistical differentiation to logistical efficiency to firm performance, companies that are able to
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differentiate themselves from their rivals in the logistics industry are more likely to have more efficient logistics operations. This, in turn, can lead to improved firm performance. These findings lend credence to the notion that differentiating oneself from the competition can result in a competitive advantage. This finding suggests that businesses that are able to provide distinctive logistics services or capabilities are more likely to have effective logistics operations, which, in turn, can boost the performance of the business.

Table 4.4.
Mediation Analysis

| Mediation Path                                | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | T statistics (|O/STDEV | P values |
|----------------------------------------------|---------------------|-----------------|---------------------------|----------------|----------|
| Logistic Differentiation -> Logistic Effectiveness -> Firm Performance | 0.081               | 0.084           | 0.029                     | 2.832          | 0.005    |
| Logistic Cost -> Logistic Effectiveness -> Firm Performance              | 0.157               | 0.154           | 0.101                     | 1.558          | 0.119    |
| Logistic Quality -> Logistic Effectiveness -> Firm Performance            | 0.069               | 0.071           | 0.081                     | 0.848          | 0.397    |
| Logistic Cost -> Logistic Effectiveness -> Firm Performance              | 0.028               | 0.030           | 0.016                     | 1.743          | 0.081    |
| Logistic Quality -> Logistic Effectiveness -> Firm Performance            | 0.068               | 0.072           | 0.030                     | 2.258          | 0.024    |
| Logistic Differentiation -> Logistic Effectiveness -> Firm Performance   | 0.343               | 0.335           | 0.124                     | 2.756          | 0.006    |

It stands to reason that businesses that are able to differentiate their logistics operations will also have logistics operations that are more effective given the strong correlation that exists between logistical differentiation, logistics effectiveness, and firm performance. These findings lend credence to the notion that differentiating oneself from the competition can result in a competitive advantage. According to this finding, businesses that have differentiated capabilities or services in the field of logistics are more likely to have efficient logistics operations, which, in turn, can boost the firm’s bottom line.

When viewed as a whole, the significant paths of the SEM-PLS model emphasise how important it is to have good logistics management in order to increase the efficiency of a business. According to the findings, it would appear that businesses that have superior logistics operations enjoy greater success in comparison to those that have logistics operations that are only average in terms of quality, ability to differentiate, and overall efficiency. These findings have significant repercussions for business managers and policymakers who are interested in utilising logistics management in an effort to improve the performance of their companies.

DISCUSSION

Within the scope of this investigation, we make use of a structural equation modelling partial least squares (SEM-PLS) model to bring to light the significant relationships that exist between logistics factors and business performance. According to the findings, it would appear that improved logistics management is a significant factor in the success of a company, and that businesses that excel at logistics management have an advantage over those that don’t in terms of the overall market. The first major pathway connecting logistics cost and logistics effectiveness suggests that lower logistics costs may result in
better firm performance. This idea is supported by the second major pathway connecting logistics cost and logistics effectiveness. This finding is in line with what we already know from other research about how important it is to keep an eye on costs when conducting logistics operations. (Cohen et al., 2013). As shown by the second significant path from Logistic Quality to Logistic Effectiveness, companies that are able to improve the quality of their logistics operations are more likely to have more effective logistics operations, which can lead to improved firm performance. Businesses that are able to set themselves apart from the competition by developing logistics operations that are unique in comparison to those of their competitors have a greater chance of achieving monetary success (Nagy, et al., 2018). These findings lend credence to the notion that differentiating oneself from the competition can result in a competitive advantage. Better company performance may be the end result of a chain reaction that begins with logistical differentiation and ends with logistical effectiveness.

This chain reaction could have been started by either of these two phrases. The correlation between differentiation and efficiency in logistics operations is further evidence that a firm’s ability to differentiate itself can lead to improved performance (Maas et al., 2014). This correlation was found to exist. The significant relationships that exist between these two variables and firm performance suggest that it may be essential to improve the efficiency and effectiveness of logistics operations in order to boost firm performance. This is indicated by the fact that significant relationships exist between these two variables and firm performance. These findings lend credence to the hypothesis that businesses can realize significant cost savings by improving the efficiency of their logistics operations, and that doing so can also lead to an increase in their overall levels of productivity.

In conclusion, the findings of this SEM-PLS model highlight how important it is to have efficient logistics management in order to raise the bar for the effectiveness of businesses. The significant paths suggest that potential drivers of better firm performance include things like increasing the effectiveness and efficiency of logistics, differentiating logistics operations, lowering logistics costs, and so on. These findings have significant repercussions for business managers and policymakers who are interested in utilizing logistics management in an effort to improve the performance of their companies. The findings of the SEM-PLS model’s mediation analysis highlight the importance of logistics management in increasing the efficiency of businesses. As the identified pathways imply, a more effective and efficient use of logistics may lead to improvements in the performance of a company, which in turn may result in stronger firm performance.

In light of these findings, it is abundantly clear that logistics managers need to place a high priority on quality and differentiation in order to enhance the performance of their companies. The findings suggest that increasing quality can enhance logistic effectiveness, which in turn can lead to improved firm performance. Logistic quality is an essential component of logistics operations. The quality of a company’s logistics operations can be improved with the assistance of quality management practices such as process improvement, quality control, and quality assurance. Based on these findings, managers should probably prioritize the implementation of quality management practices in order to improve the quality of their logistics operations. The findings also suggest that differentiation can be a key driver of competitive advantage, and
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companies that are able to differentiate their logistics operations are likely to have more efficient and effective logistics operations, which can ultimately lead to better firm performance. Offering distinctive logistical services or capabilities that are difficult for competitors to imitate is one way to differentiate oneself from the pack. Therefore, in order to improve their firm's performance, managers should concentrate on finding ways to differentiate their company's logistics operations from those of their competitors. In general, the results of the mediation in the SEM-PLS model suggest that logistics management is a crucial factor in the pursuit of improved firm performance. The findings provide important insights for managers and policymakers who are looking to improve firm performance through logistics management, and they highlight the importance of improving logistics quality and differentiate in order to achieve better firm performance.

CONCLUSION

The application of SEM-PLS modelling in this research has resulted in the generation of intriguing new information regarding the connection between logistical factors and the performance of businesses. The significant pathways that were discovered shed light on the significant role that logistics management plays in the enhancement of an organization's overall performance. The findings highlight how important it is to improve firm performance by decreasing logistics costs, increasing logistics quality, differentiating logistics operations, and increasing logistics effectiveness and efficiency. These findings highlight the significance of effective logistics management in producing profitable business outcomes.

The ramifications of these findings will be of great assistance to managers as well as those responsible for formulating policy. These insights can be used by managers to better understand how improving logistics management procedures can impact their businesses' overall performance. Managers have the ability to raise their industries' levels of productivity and competitiveness by placing a greater emphasis on the quality and individuality of their logistics operations. To determine whether or not factors that are specific to an industry have an impact on the relationship between logistics management and firm performance, further research is required.

These findings also make a significant contribution to the body of research that has been done on logistics management and the performance of businesses. This study makes a contribution to the existing body of knowledge and improves our understanding of the complex dynamics that are present within the field of logistics management by highlighting the importance of a variety of logistical factors on the performance of firms. These findings have applications in the real world for professionals working in logistics management as well as policymakers responsible for establishing industry regulations and standards.

As we draw to a close, it is essential to identify some gaps in knowledge as well as potential subjects for further research. In light of the limited scope of the study, it is of the utmost importance to ascertain whether or not the findings are applicable to other economic fields and geographical regions. The influence of variables that are unique to a particular industry on the connection between effective logistics management and company success should be the subject of further investigation in the future. Additional research into the sustainability and long-term effects of improved logistics practices on
business performance would shed light on the dynamic nature of this relationship and help shed light on how this relationship works.

In conclusion, the findings of the study demonstrate the significance of logistics management in terms of improving the performance of businesses. The findings shed light on the significance of a variety of factors related to logistics as drivers of improved business outcomes. Some of these factors include cost reduction, quality improvement, differentiation, and improvements in effectiveness and efficiency. These insights can help managers and policymakers improve their decision-making processes and enhance their organisations' procedures for logistics management. The findings of this study add to the existing body of knowledge, and the insightful conclusions that follow highlight the significance of ongoing research and technological advancement in the field of logistics management, particularly with regard to the ways in which it influences the performance of businesses.

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Conflicts of Interests: The authors declare no conflict of interest.
Consent to Participate: Yes
Consent for publication and Ethical approval: Because this study does not include human or animal data, ethical approval is not required for publication. All authors have given their consent.

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