



**ASSESSING TRANSPORTATION OPTION CHOICES AND ITS IMPACT ON
LOGISTICS PERFORMANCE –THE CASE OF PAVE LOGISTICS SERVICES PLC
ADDIS ABABA**

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**A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE
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Pave Logistics Company Addis Ababa**

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DECLARATION

I hereby declare that the thesis entitled: **Assessing Transportation Choices and Its impact on Logistics performance: The Case of Pave Logistics Company Addis Ababa** is submitted by me for the partial fulfillment for the award of Masters of Art in Logistics and Supply Chain program at Addis Ababa university, School of commerce is my own original work and has not been submitted earlier either to Addis Ababa university or to any other institution for the fulfillment of the requirement for any course of study

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Acronyms

AAE	Airports Administration Enterprises
ALADI	Andean Community, the Latin American Integration Association
ASEAN	Association of South-East Asian Nations' laws and regulations
CAA	Civil Aviation Authority
CAA	Civil Aviation Authority
EcMS	Euro system Collateral Management System
ERC	Ethiopian Railways Corporation
ERCA	Ethiopian Revenues & Customs Authority
ESLSC	Ethiopian Shipping Lines Share Company
ET	Ethiopian Airlines
GDP	Gross domestic product
ICSC	International Cargo Security Council
ICT	Information Communication Technology
JIT	Just-In-Time
LIDI	Leather Industry Development Institute
LPI	Logistics Performance Index
MM	Materials Management
MoFED	Ministry of economic development
MT	Metric Tone
PAVE	Presort Accuracy Validation and Evaluation
PDM	Physical Distribution Management
PLC	Private Limited Company
PUIs	projects of urban improvements
SCM	Supply Chain Management
SPSS	Statistical Packages for Social Scientists
TMS	Transportation management system

Abstract

Logistics is a process that prepares, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services, and related information between the point of origin and the site of consumption to meet consumers' needs. The main purpose of this study was to Assessing Transportation Choices and its impact on Logistics performance in the Case of Pave Logistics Company Addis Ababa. The study utilized mainly quantitative data analysis techniques. Descriptive statistics such as mean, percentage and frequency tables were used to describe the data. From the total population of 252 employees 153 samples were used by using availability sampling technics. Inferential statistics such as ordered logit model were employed in order to answers the basic question and answer the research question respectively. The study incorporate 6 independent variables in which all of them was measured on a 5-point Likert-Scale, with “1” stands for “Strongly disagree” and “5” stands for “Strongly Agree”. Apparently, mean was used as a measure of central tendency. Furthermore, the data were encoded, processed and analyzed using SPSS.V20. Moreover the correlation analysis shows that performance has a positive and significant relationship with all variables these are the cost of service, nature of commodity, regularity, speed, safety, and security and flexibility hence all variables are the significant factors in other logistics services as well. Regarding the regression analysis, some of the coefficients are having a positive meaning that change in any one of the independent factors affects the performance in the same direction except speed, flexibility and safety, and security. Overall, the consistency of regression coefficients on the selected area suggests that these variables are important indicators for affecting the performance of transportation choice at pave logistics service to different degrees and some of the independent variables were significant predictors of performance efficiency and effectiveness. In general the study concludes that the transportation choice and performance of Pave logistic service are found in a good manner with exception of those variables that are not significant in the study.

Key words: Logistics, Transportation choice

CHAPTER ONE

INTRODUCTION

This chapter provides background information about the study's topic, including the issue statement, research purpose, research question, and study importance. Other elements of the chapter are also covered, such as the study's delimitation. The study's basis examines essential topics in logistics and mobility (transportation) systems, which will be examined.

1.1 Background of the study

In today's internationally competitive company environment, companies are primarily focusing on cost containment, quality assurance, and other competitive advantages as strategic demands to pursue in order to emerge victorious in a persistently fast-paced market climate of global economic difficulties. This has put a lot of pressure on all forms of commercial activity, whether local or international. As a result, logistics has developed as a vital component of a profitable organization's proper operation, as it connects all of the company's functional components. In effect, to satisfy the growing demand for logistics services, a well-functioning transportation facility has become a necessary precondition for meeting the needs of logistics supply cost-effectively without compromising the quality of the services or products.

To meet the demands of customers, logistics is a process that prepares, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services, and related information between the place of origin and the point of consumption. Logistics is the process of carrying and handling goods and materials from the beginning to the end of the manufacturing, sales, and waste disposal processes in order to satisfy customers and boost business competitiveness. Transportation refers to the movement of goods and people from one location to another, and it includes buses, trains, airplanes, ships, automobiles, and other types of transportation that used to transport products and persons from one location to another using which such movement is performed.

Without a well-developed transportation infrastructure, logistics would be impossible to fully realize its benefits. Logistics began as a military operation aimed at delivering soldiers and weapons to the battlefield in time for takeoff, but it is today acknowledged as a critical

component of modern production. The American recession of the 1950s, which pushed the manufacturing sector to prioritize product circulation, was a major driver of its rise. The term logistics was coined in the late 18th and early 19th centuries in the context of military activities, and it was popularized by World War II military logistics. The word logistics, which meaning "expert in calculating," is considered to have inspired the name.

According to BTRE (2001), military nomenclature usually includes the supply, transportation, and quartering of troops in a set. Several studies have since been completed, and logistical applications spanning from military to corporate activity have been devised. The transportation system is the most important economic activity among the components of commercial logistics systems. Logistics refers to the complete process of goods and products moving into, within, and out of an organization.

The transportation of material into a company is covered by inbound logistics. The flow of materials and components within a company is referred to as materials management. The transfer of commodities from the site of manufacture to the ultimate user is referred to as physical distribution. The transportation unit is required for the transfer of goods from the supplier to the production plant, within the plant's compound, from the warehouse to the factory, from the factory to the warehouse, and from the warehouse to the distributors and end customers (Srinavas, 2001).

The logistic business began to move away from traditional transportation in the 1990s, and it continues to do so at a rapid pace today. The flow and storage of goods and related information, according to the Council of Logistics Management. All processes for planning, implementing, and managing the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished items, and related information are targeted at meeting customer requirements from point of origin to point of consumption (Hai Lu & Yirong Su, 2002).

Logistics is also becoming a crucial source of competitive advantage and a driving force behind strategic alliances between businesses and their logistics suppliers. As a result, logistics is emerging as a key source of competitive advantage and a leading reason for strategic alliance relationships between companies and their logistics providers, rather than a traditional function involving adversarial relationships among suppliers, customers, and transportation providers (Hai Lu & Yirong Su, 2002).

Transportation and logistics, on the other hand, are key components of a successful economy. Governments all around the world are striving to create or replace infrastructure in order to increase their competitiveness. The transportation and logistics sector is vital at both the national and local levels in any country, contributing considerably to the global economy. The economy benefits from this business since it allows for the efficient flow of goods, services, and people (Sophia, 2013).

Mobility in logistics and supply chain refers to the movement of goods and services from production to consumption, as well as all the intermediates that facilitate this movement (Wang, Jie, & Abareshi, 2018). As technology and logistics have grown in recent years, logistics and supply chains have become more mobile. As a result, the dynamic shift in transportation and related technologies that are converting mobility into a new experience is one of the most relevant and impactful sectors.

Furthermore, high-quality logistic services are essential for promoting international trade in goods transportation; ineffective logistic services stymie trade by adding time and money to the process. The demand for effective logistics services is growing as industrialized countries shift away from traditional manufacturing and agriculture and toward international vertical specialization. High-quality logistics services boost a country's export competitiveness by cutting transportation costs, which is especially essential for countries that are geographically separated from large markets (Fekadu, 2013).

In business, an inefficient logistics system combined with inefficient internal management would disable an organization's ability to respond to customer needs at the lowest possible price in the shortest possible time frame, including a quality level that does not meet customer expectations, and would put the company at a competitive disadvantage. Mwangangi and Nyaberi (2014).

The ability to deliver goods swiftly, safely, economically, and reliably (logistics) is important for a company's performance, as well as a country's wealth and ability to participate in the global economy (Fekadu, 2013). As a result, logistics is an important part of a company's profitability and competitiveness (Hajiesmaeili, 2016).

Logistics has become a significant factor in producing competitive advantages and creating value through the planning, implementation, and control of processes linked to physical flows, as well

as the integration of operations across the supply chain (Alarcon &Antun, 2013). On the one hand, efficient management of vital and supporting logistical operations lowers costs associated with commodity flow through the supply chain, production and physical distribution costs, and especially storage, inventory, and transportation costs. On the other hand, the ability to position a product at the right place at the right time to meet a customer's demands before its competitors can do so is referred to as competitive advantage (Alarcon &Antun, 2013).

A variety of logistics factors combine to influence supply chains and, as a result, trade flows. Transportation is the most expensive aspect of logistics, and it is only achievable with proper infrastructure. The quality of the transportation infrastructure is crucial, whether these logistics providers offer their own transportation or rely on third-party transportation. As a result, swift shipping is essential for the company's day-to-day commercial activities and the infusion of a wide supply of logistic services. The purpose of this study is to gather and analyze several PAVE mobility claims in order to redefine and clarify the relationship between transportation and logistics systems. As a result, the company will need to learn from its best practices in terms of logistics mobility system performance and transportation management system improvements, as well as general organization service enhancement.

1.2 Background of the study area

Pave logistics and trading Plc. is a logistics company established and registered in Ethiopia in 2015. To establish the business in this industry, the company has gone through research to come up with the gap in the industry and has discovered that there needs to be done a lot of work to fill the gap especially in paving the way for clearing and forwarding which is the motor for any Economy in this world. Based on this fact, the company came up with highly sophisticated and customized service solutions, which filled the gap at its stake for those clients who tasted it so far. However, pave logistics and trading Plc have brought a culture of business-caring for customers' business which will be manifested by short-time delivery, seven days a week service, professional consultancy in customs tariff, customs valuation, clearing of manufacturing goods for the local market as well as for export under EcMS or voucher scheme, clearing and forwarding of project goods, and on humanitarian logistics. To increase the company workers' capability of doing the business professionally, the company renders intensive training for the employees. To save the invaluable time of the customers, the company has devised a culture of working seven days a

week in the office and over the Djibouti port as well. Also, Pave Logistics Company is engaged in Freight Forwarding and supply chain management service based in Ethiopia. Pave Logistics is serving 10 offices within Ethiopia, 1 liaison office in Djibouti, and a fully equipped branch office in China-Tianjin Port, Lingang District.

Pave Logistics serves the local market impeccably through Land transportation in Import/Export, Canvassing of Sea Freight, Airfreight sales, clearance and transportation to and from customers' premises, value-added services on consultancy on compliance, and many more. Currently, the company has 10 sub-branches in the country of Ethiopia with a total employee of 252 of all 116 employees are permanent and located in Ethiopia.

1.3 Statement of the problem

Ethiopia is a landlocked country located in Eastern Africa bordering the Sudan, Eritrea, Djibouti, Somalia, and Kenya. Efficient trade and logistics are important for attracting foreign direct investment, as they can increase a country's import and export capability. Logistics practice in Ethiopia is characterized by its underdeveloped state (Fekadu, 2013).

As a developing country, Ethiopia needs to exploit the opportunities of globalization. Since trade and foreign direct investment are the key channels for the international diffusion of knowledge, poor logistics may impede access to new technology and know-how, therefore slowing the rate of productivity growth. Conversely, increased trade creates demand for good logistics, putting pressure on facilitating reforms and sustaining a market for modern services (Arvis et.al, 2012). The trade cost of Ethiopia is labeled as very high as compared to even countries with similar economic development (Bekele R. Kebede, 2015).

According to the (World Bank, 2018), Logistics Performance Index (LPI) which measures trade logistics efficiency, Ethiopia was ranked 126 out of 160 countries and all scores are below the averages of the Sub-Saharan Africa region. Hence, the ability to transport goods quickly, cost-effectively, and reliably is critical to a country's affluence and ability to compete in the global market, and it can be a major trade cost driver if these goals are not met. Because of the evolution of technology and logistics, more use of technology to facilitate more efficient logistics and supply chain management in organizations is possible.

However, the Ethiopian logistics system is characterized by a poor logistics management system and a lack of coordination of goods transportation, a low level of development of logistics infrastructure, and insufficient fleets of freight vehicles in terms of number and age, as well as damage and quality deterioration of goods during handling, transport, and storage. This, combined with the lack of a seaport, resulted in a poor link between producers (farmers) and consumers (market), as well as non-competitiveness of Ethiopian goods on the global market, jeopardizing the people's livelihood and the country's economy.

Also, the government of Ethiopia has an effort to make simplified logistical activities for major players, especially ERCA (Ethiopian Revenues & Customs Authority) but it does not encompass the rest of the major players in the sector. Among the major logistics facilitators which comprise Customs Authority, Freight Forwarders, Transportation, and Warehousing, this study emphasized logistics service providers mainly to look into the gaps in handling country import and export logistics process.

However, in our country, the uses of inferior transportation facilities, as well as the lack of suitable knowledge and human skills in the operation of transportation facilities in managing logistics practices, are among the primary factors leading to the industry's poor performance (LIDI Annual report, 2013). The issues that arise as a result of logistics operations involve both human and non-human factors. The human component is linked to poor performance of some transportation professionals as a result of neglect, a lack of awareness of the significance of teamwork, and insufficient training. As a result, the insufficiency, unreliability, and poor quality of transportation facilities obstruct appropriate logistics supply management and therefore become one of the major issues obstructing the efficiency of logistics across the company's operation roots, resulting in delayed performance. Although several academics have attempted to address the issue of transportation in logistic chain performance, previous researchers have not addressed the issues of delivery speed, service quality, operating costs, facility utilization, and energy conservation in depth.

Furthermore, there are various articles and studies about logistics and transportation systems in Ethiopia, so far the studies were not focused on factors affecting transportation management practice and choice rather the studies were focused on Logistics Practices in Ethiopia Debela, (2015), the objective of this work is to assess the current status of logistics practices in Ethiopia

with the aim of identifying the gaps, potentials and constraints for development of effective and efficient logistics system and the finding reveal that Presence of road of high density and quality makes efficient distribution of goods easy. Customer orientation, low level bureaucracy at customs and trade facilitations expedite goods flow. Availability of skilled manpower, conducive labor regulations and business environment promotes economic activities. On most of these criteria, Ethiopian logistics system is found to be poor. There is urgent need for research on the problems, for which Excellence Center for Freight Transport and Logistics in Ethiopia (EthioLog) is established. Intermodal transport system is the best solution and commencement of construction of rail line is an opportunity to use road-rail integrated intermodal transport system to solve the logistics problems of the country Debelo, (2015).

Assessment of the Impact of Logistic Performance on Trade in Ethiopia Shewangizaw, (2016), The objective of this work is to assess the current status of logistics practices in Ethiopia with the aim of identifying the gaps, potentials and constraints for development of effective and efficient logistics system and trade competitiveness. The finding indicates that presence of road of high density and quality makes efficient distribution of goods easy. Customer orientation, low level bureaucracy at customs and trade facilitations expedite goods flow. Availability of skilled manpower, conducive labor regulations and business environment, co-ordination between institutions, development of ICT promotes economic activities. On most of these criteria, Ethiopian logistics system is found to be poor and there is urgent need for research on the problems, and the government needs to work on building the capacity of institutions and create the integration needed between them. It should also start to look other available port options so that to minimize the economic dependence and excessive cost incurred from Djibouti port. Furthermore usage of ICT, adaptation of modern logistics activities and investment on research on such issues should also be seen as a mechanism to improve the logistic performance and trade competitiveness of the country Shewangizaw, (2016).

The role of transportation in logistics chain Yue, Taylor and Tseng (2005), the objective of the paper is to define the role of transportation in logistics for the reference of further improvement. The research was undertaken to assist logistics managers, researchers and transportation planners to define and comprehend the basic views of logistics and its various applications and the relationships between logistics and transportation. The study finding revealed that logistics and

transportation have some relevance also logistics system has a more and more important position in our society activities, transportation and logistics systems have interdependent relationships that logistics management needs transportation to perform its activities and meanwhile, a successful logistics system could help to improve traffic environment and transportation development in addition, since transportation contributes the highest cost among the related elements in logistics systems, the improvement of transport efficiency could change the overall performance of a logistics system and finally transportation plays an important role in logistics system and its activities appear in various sections of logistics processes. Without the linking of transportation, a powerful logistics strategy cannot bring its capacity into full play Yue, Taylor and Tseng (2005). And Impact of mobility solutions on logistics services (Ormanov, 2021) here the main objective is to determine how technologically enabled mobility solutions create or distort effectiveness in the logistic services and the finding indicate that, smart technologies have become commonplace in the logistics sector, with several technologies developed to enhance efficiency and speed in the sector. In the global supply chain, businesses have adopted a range of systems that ensure stakeholders in logistics, including communication, warehouse management, customer relations, and enterprise resource planning systems. This makes the supply chain framework more efficient and transparent in the global logistics sector also the study concluded that technology has a crucial role in the logistics sectors future. Several technological developments have been used in logistics to date, which provides context to understand that it will continue to create efficiency and speed.

Even though there are studies conducted (Kumelachew, 2020) on determinants of household choice for transportation services in Addis Ababa also this study was observed the factors affecting people in choosing transportation means for a different activity and involves only land transportation modes which are a private car, bus, train, and minibus taxi. Yet the main purpose of this study will try to fill those undetected parts particularly the above study did not touch the private companies who gave logistics service and more focus on governmental institutions of logistic performance also those study focused on more information communication technology with logistics performance, yet our country level is not as such technologically advanced therefore this study try to assessing the performance of transportation management practices and mobility (transportation) options on logistics by using those six variables (cost of service, nature

of commodity, regularity, speed, safety, and security and flexibility) the case of pave logistics company Addis Ababa.

1.4 Research question

The research is guided by the following questions;

- What is the influence of cost on the choice of transportation and Logistics performance?
- How do speeds influence the choice of transportation and performance of the Logistics?
- How does flexibility affect the choice of transportation and the performance of the Logistics?
- How does regularity influence the choice of transportation and performance of the Logistics?
- What is the influence of safety and security on the choice of transportation and performance of the Logistics?
- How nature of the commodity matter to the choice of transportation and performance of the Logistics?

1.5 Objective of the study

This study has both general and specific objectives:

1.5.1. The general objective of the study

The general objective of the study was to assess the transportation choice and its impact on logistics performance in the case of pave logistics company Addis Ababa.

1.5.2 Specific objectives of the study

The specific objectives of the study will be:

- To identify the influence of cost on the choice of transportation on Logistics performance
- To identify how speeds influence the choice of transportation and performance of the Logistics
- To find out how flexibility affects the choice of transportation and the performance of the Logistics

- To measure how regularity influences the choice of transportation and performance of the Logistics
- To investigate how safety and security influence the choice of transportation and performance of the Logistics
- To explore how the nature of commodity affects the choice of transportation and performance of the Logistics

1.6 Significance of the Study

Analysing transportation choice on logistic activity is critical for pave logistic Plc. and other stakeholders and organizations, especially importers and exporters and their partners. Furthermore, the research has included some ideas for transportation options and management in logistical activities. Partners would be able to analyze their transportation choice performance using the research findings. Furthermore, this study maybe used as a benchmark for other researchers to fill the gaps and address the issues that this study has identified.

1.7. Scope of the study

The study was conducted on transportation choices and their impact on the performance of pave logistics service in Addis Ababa based on factors (cost, speed, flexibility, regularity, safety & security & nature of commodity) collected from the literature. The data collection of the study was done by quantitative research design through a structured questionnaire. In addition, this study focused only on the Pave Logistics Company of Addis Ababa. Therefore, this research was confined only to the selected study area. The results and conclusions in this finding may not be valid in places outside of the study area.

1.7.1. Thematic scope

This study focus on the transportation choices and their impact on the performance of pave logistics service in Addis Ababa. While plays a role in a variety of organizations and settings, the research of factors the impacts of transport logistics success was an issue for PAVE companies, and it focused on examining the factors that impact logistics success the factors of cost, speed, flexibility, regularity, safety and security & nature of the commodity. This excludes the accomplishment of positive logistics.

1.7.2. Spatial scope

Pave Logistics Company is one of the Addis Ababa city administration's transportation Companies. There are 10 sub-branches in the country of Ethiopia. It was limited to selecting the main office in the samples selected by the study to identify the factors affecting transportation management practices and choices on the performance of pave logistics service Addis Ababa Company.

1.7.3. Temporal scope

The research was held from November 2021 to June 05, 2022, G.C.

1.8 Limitation of the study

Although all study are not free from limitation, therefore, this study has some limitation as well. The main limitation was since the researcher is out of the country it's difficult to contact the respondents on time by phone and internet and those of whom are also not willing for the interview (Key informant interview) with deferent reason, because of this, the study was conducted only using questioners. The study also could not conduct a comparative analysis b/n Pave logistics and other Logistics companies in Ethiopia.

1.9 Organization of the study

This study is organized into five chapters: Chapter one contains the introduction part dealing with the background of the study, statement of the problem, objectives of the study, significance of the study, scope, and limitation of the study, and definition and terms.

The second chapter discusses a related literature review on logistics and transportation options. In this chapter, the researcher focuses on related empirical and theoretical literature in logistic activity to develop a conceptual framework that would address the problem statements indicated in chapter one.

In chapter three the research design and methodologies have been presented. Sample and sampling techniques, source of data, procedures of data collection, and methods of data analysis have been discussed.

In chapter four results or findings of the research are presented. The findings have been interpreted. Lastly, chapter five comprised the research findings, conclusion, and

recommendations. The summary have been made based on findings and results which are stated in chapter four followed by a conclusion and recommendation.

1.10 Definitions of key terms

Transportation - Transport (British English) or transportation (American English) is the movement of people and goods from one place to another. The term is derived from the Latin *Trans* "across" and *portare* "to carry" (Mathew & Rao, 2007).

Logistics - Council of Logistics Management (1991) defined logistics is ‘part of the supply chain process that plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption to meet customers’ requirements. Logistics is one of the trade facilitating factors in global trade. It is a multidimensional factor in trade operations focusing on processes, skills sets, and technologies. Specifically, logistics affects trade performance of a country in terms of cost, time, reliability and predictability and customer services, which further affect overall competitiveness of the export in the international market other things being constant Arvis et.al (2007).

Logistic service- Logistics services are all the elements of your supply chain, from the factory to the end customer. They include transportation from manufacturer to warehouse, warehousing and order fulfillment, and delivery to the end customer (Rheude, 2021).

Mobility -Mobility is the potential for movement and the ability to get from one place to another using one or more modes of transport to meet daily needs. As such, it differs from accessibility, which refers to the ability to access or reach a desired service or activity alsomobility focuses on the satisfaction of needs, while transport (including vehicles, infrastructure, and traffic rules) is the instrument that is required for the concrete realization of mobility. Consequently, mobility is a direct result of social activities such as living, working, relaxing and production, trade, and consumption (for goods). Due to the spatial separation of activities, a demand for transport services arises. The type of transport services chosen to meet this need for mobility is the result of a political process.(Handy, 2002).

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 Theoretical Literature Review

2.1.1 Transportation

Physical Distribution Management (PDM) is commonly regarded to be primarily concerned with the flow of items from the receipt of a request until the merchandise is delivered to the client, (Lysons et al., 2006). Though Materials Management (MM) is more concerned with moving purchased requirements from organizational supply providers to production and development, PDM is concerned with the yield period of moving completed merchandise from production divisions to completed products stores, and then through appropriate distribution channels to a final ultimate customer. Stock control, warehousing and capacity, materials storage and handling, protective packaging, containerization, and transportation are the main PDM exercises. Improvements such as Just-In-Time (JIT), in which manufacturers and distributors both carry and manage a few hours' worth of inventory and primarily rely on supplies providers to meet their production or sales requirements, have greatly increased the importance of PDM. The logistician's point of view is that "what streams can be made to stream faster?" (Lysons et al., 2006).

The logistician considers the venture's expenses from this perspective, beginning with the basic input component, time spent on the manufacturing process, and ending when the client pays for the item or service delivered. The more time spent on each stage of the treatment, the more money will be spent. A reduction in time taken at any level allows for cost reduction, which can result in a lower ultimate product or service price. Along with cost-effective transportation management, service quality levels must match targeted consumer expectations. If the item does not arrive where and when it is needed, reasonable transportation is of little value to an inventory management network. Amazing client-centered transportation has a direct impact on an organization's ability to provide the seven "Rs of Logistics," which include getting the right thing to the right client in the right amount, in the right condition, at the right place, at the right time, and for the right price. (2006) (Lysons et al).

Furthermore, transportation can improve the adaptability of supply chain networks. Business entities can meet consumer supply needs for better, next-day service as well as more economical and cost-effective delivery of processed orders by partnering with transportation service providers that offer a variety of transit times and service options (Coyle et al., 2013).

According to Baker et al. (2006), the changing perspective of logistics and the supply chain management aspect, especially the move by many organizations towards worldwide operations, has affected the relative significance of the distinctive methods of transport. In a worldwide setting, more items are moved far longer routes and distances since organizations have created ideas, for example, center industrial facilities - with a solitary worldwide assembling point for specific items, and on account of the centralization of production plants in reduced cost producing areas. Long-distance transportation options have in this manner turned out to be substantially more essential to the advancement of effective logistics management operations that have a worldwide viewpoint. In this way, the need to comprehend the relative benefits of, say, ocean shipment as against air shipment is critical even though, for some restricted last conveyance operations, it is still road transport that offers the only practical solution. These improvements serve to underscore the need to recognize the wide range of aspects of transportation modular decision options for universal logistics (Baker et al., 2006).

The majority of the major modes of transportation can be considered for product development on a worldwide scale. As a result, determining the most appropriate mode of transportation is a critical decision for universal distribution and logistics management, with the fundamental paradigm being the requirement to modify costs by customers' desired service levels. These are extremely important trade-offs to consider when weighing the options available between various logistics management aspects and various types of transportation.

a. Sea Transport

For maritime cargo transit, sea transport is the most common method; both the regular load and unit modes are relevant. The following are the major considerations for regular ocean cargo: For a few commodities, traditional maritime transportation and movement remain the most cost-effective mode of transport. This is especially true for bulky products and large bundled

dispatches being transported to distant locations. When the speed of service isn't a factor, the cost-effectiveness of maritime transportation makes it a compelling option (Review of Maritime Transport 2019).

Ocean transportation services are widely available, and a wide range of cargo can be transported. For a variety of reasons, ocean freight tends to be moderate. This takes into account the fact that, as the actual trip time, turnaround time in port is still relatively slow. Slow handling tactics are still in use, which burdens and harms ordinary ocean freight. When compared to the more targeted 'through transport' frameworks with which maritime cargo movement must fight, this is especially visible. The problem is particularly noticeable on some of the shorter maritime routes. Three significant reasons can lead to inadequate service provision measures, as well as a shorter transportation length. These are much beyond the duration of the cruise. They include, among other things, pre-shipment delays, delays at the release port, ongoing negative effects due to an unfavorable climate, and missed tides. Traditional boats are more likely to damage both consignments and packing materials due to the necessity to double manage shipments (Review of Maritime Transport, 2019).

b. Road Transport

In any country, road transportation is the most important mode of development. Even if there are major geographical location imperatives, such as to and from a neighboring country, road transportation is considered important for cross-border distribution. The real areas of interest and disadvantages of road transportation benefits are detailed below, as they may be related to various methods of global transportation: They can provide a rapid and effective solution in situations when ship and ferry schedules can be planned into routing designs if they are a critical component of the distribution operation. From a cost standpoint, they can be particularly beneficial for completed unit loads with a single source and destination emphasis.

There is no longer any need to double-handle and transport products and packaging, and this is eliminated for immediate, full-stack deliveries. Because loads are less subject to the extreme travel that different modes might generate, packaging costs can be maintained to a minimum. Because of the versatility of road transport vehicle planning, the framework can provide customary booked services. When used for loads that aren't as large as lorry-sized, road cargo

transport can lose its speed advantage. Consolidation and, as a result, invoicing double handling at both ends of the travel, extra packaging, and time-related delays would all be involved (Woodburn, et al2008).

c. Rail Transport

More traditional rail shipment frameworks, according to (Makori, 2017), offer the distinct advantage of being a moderately less expensive means of transportation. This is especially true for large and significant commitments that must be developed over medium to long distances and when delivery speed is not critical. The following are the typical flaws with regular rail transportation: As they are shuffled about merchandise yards, rail cars are prone to some severe stuns. Goods in transit may be damaged by shunting stuns. Expensive packaging methods should be used to combat this. There is a need to double handle with increased consolidations because the first and last leg of a 'through' adventure regularly should be by road transport. There are a predetermined number of railheads accessible at industrial facilities and warehouses, thus making direct source point to destination shipping plans exceptionally uncommon. As of late, many organizations with railroad sidings on their premises have shut them down because of their high cost of maintenance and operation. All in all, rail transport is a relatively slower undertaking carriage-especially when the entire trip is considered. Many cargo trains need to fit their calendars around traveler trains, which would take prime consideration. Rail cargo transit is notoriously unreliable. Wagons in convoys can arrive at inconvenient times. If the entire consignment is covered by a combined customs clearance document, this can result in additional delays for global transportation. There are major similarity difficulties for cross-border shipments. Variations in track gauge sizes, connection statures, and the lack of electricity are among them (Makori, 2017).

d. Air-freight Transport

In recent years, the use of air freight shipping as an alternate means of transportation has grown considerably. Significant developments in the areas of integrated unit loads, improved storage and handling frameworks, and additional cargo loading capacity, as well as the expansion of planned cargo flights, have increased the competitiveness and service-level capabilities of air-freight cargo movement. Over longer worldwide distances and movements, air freight shipping compares favorably to other modes of transportation. This is due to its significantly shorter airplane terminal

to air terminal travel times compared to these longer separations. Although air freight cargo service is faster from one airport to another, there is a risk that this speed factor will have significantly less leverage because time might be lost due to air terminal clogs and processing, more documentation, and customs clearance delays. One particular desired viewpoint is the 'lead-time economy,' which refers to the ability to move things quickly across great distances, giving the appearance that it is unnecessary to keep stocks of these required items in the countries under consideration. Air freighting of goods necessitates a great deal of market adaptability, as any number of countries and marketplaces can be involved. Because of the adaptability of air freight transportation, an organization does not need to set up large stock-holding systems in these areas, and the creation of products via air freight shipment can result in a significant reduction in packing requirements. Because air freighting transfers are not subjected to harsh physical circumstances, they are less prone to damage and breakage. When compared to a variety of alternative possibilities, airship cargo transport is extremely advantageous for specific types of products. This includes things with small weight dimensions but great economic worth, such as fashion items, emergency supplies, perishable goods, and vital spares for both the motor and manufacturing industries.

2.1.2 Transportation management system (TMS)

The transportation management system is the rising sun of supply chain management. It has been noticed since the latter half of the twentieth century, but only since the beginning of the twenty-first has it been recognized as a mature system. (Federal Highway Administration, United States Department of Transportation, 2005) In the early 2000s, organizations all around the world began to construct TMS's distinctive many services to deal with the difficult situation. Since the beginning, TMS has been a significant focus for manufacturers, distributors, and third-party logistics providers in their pursuit of a lean, agile, and efficient customer-oriented supply chain. Not surprisingly, the TMS theoretical model's stable and ongoing evolution encourages the development of TMS computerized software. The majority of today's medium and large businesses have purchased and used TM software to manage and monitor their operations, according to the Federal Highway Administration (2005).

2.1.3 Transport Management

From procurement through freight settlement, Transport Management enhances operations. It aids in the streamlining of transportation operations and the reduction of expenditures. It also gives you more control and visibility over the entire process. Procurement, planning, execution, worldwide trade management, and freight settlement are five overviews in Transport Management. Long before loading to route or a shipment to tender, the procurement of getting the most value from transportation spending begins. Planning is critical to build the best plan for maximizing savings and services. Not only must the execution capabilities be extensive, but they must also be highly agile. It is necessary to stay up with the latest legislation, documentation, and compliance challenges in global commerce management. It lowers costs, risks, and timeframes. Freight settlement in which the user is not charged twice for the same shipment (Binti 2012)

2.1.4The effects of the transportation system on logistic activities

Transportation serves as a link between the various procedures that lead to the conversion of resources into useful items for the ultimate consumer. The notion of business logistics is the integration of all of these functions and sub-functions into a system of product transportation to reduce costs and improve service to customers. Once in existence, the system must be efficiently administered (Fair et al., 1981).

Traditionally, production, storage, transportation, wholesaling, and retail sales were handled by different organizations; however, production/manufacturing plants, warehousing services, and merchandising establishments are all about transportation. Materials, components, and supplies were assembled in production or manufacturing plants, with or without storage, processing, or material handling within the plant and plant inventory. Logistics research, according to Szymonik (2012), can be defined as an orderly and targeted search for, and analysis of, data relevant to the identification and arrangement of any issue in the field of Logistics. A lot of logistics research is focused on why there is a link between certain tactics, such as logistics service offering, and logistics performance (or effectiveness). Unfortunately, the tremendous variety of ways in which performance has been characterized in many types of literature makes drawing judgments from the work done unsatisfying.

Because businesses have distinct and frequently contradictory aims, the meaning of performance is a test for specialists in every discipline of business. Profit maximization is one goal that some

people pick, while others choose customer service or sales volume maximization. Setting standards that will result in sufficient measurements for the chosen definition is similarly difficult. The logistics performance evaluation encompasses a wide variety of preparation and control estimates defined by the company's logistics management. For this type of performance estimate, various productivity parameters, customer service levels, lead times, turnover rates, and so on are routinely remembered. Cost accounting, cost determination, budget planning, standard costing, and other financial measures are also considered.

When it comes to measuring performance, creating inventory control models, route routing, and other quantitative approaches for numerical analysis of programs are not the major goals. In any case, it's critical to organize planning and controlling performance metrics to represent various aspects of Logistics activities, deal with direct material flow, define targets, and track the achievement of those goals. The purpose for measuring differs, and there are a variety of problems that can develop during the process. Broad issues can be considered measurable and quantifiable, such as represented measures that best represent the practical features, computation of feasible numerical information, the potential of conceiving the proper data, and the recording of the associated costs (Szymonik, 2012).

2.1.5 The Importance of International Multimodal Transportation System

In the twenty-first century, the growing demands of global supply chains will prompt renewed attention to intermodal freight transportation. The worldwide multimodal transportation system has substantial advantages over the unimodal system in freight transportation. In international transportation activities, the development of an effective international multimodal system has significantly reduced transportation costs and transit time. Furthermore, technological advancements are increasing the efficiency and efficacy of international multimodal transportation. From a legal standpoint, international multimodal transport, according to Breda (2009), is preferable to unimodal transport.

The author outlined five compelling legal reasons why a shipper might choose to use a multimodal transportation system before concluding that, given the diversity of cultures, languages, and commercial practices on both ends of a trade transaction, and the resulting complexity of putting together such an international transportation operation, it is likely to appear

reasonable to a trader to have one qualified operator organize, be responsible for, and be accountable for the resulting international transportation operation. Multinational corporations and governments require an international multimodal transportation infrastructure to facilitate their trade activities and reduce the cost of doing business across borders. Furthermore, Atallah (2005) recognized the value of multimodal transportation, highlighting the company's continual efforts to reduce costs and improve customer service, which led to the integration of all supply chain activities. It's difficult to think of multimodal freight transport these days without mentioning containerization.

Over the last few decades, multimodal transportation has grown in many ways around the world, and the development of containerization has greatly assisted the promotion of multimodal transportation. The multimodal transportation system has benefited greatly from the increasing containerization of freight in global trade. One of the biggest benefits of containerizing freight is that it can be transferred quickly and cheaply from ship to rail to the truck without having to unload the contents (Rahall Transportation Institute & Wilbur Smith Associates, 2004).

2.1.6 Transportation, Logistics, and Supply chain

The utilization of the most up-to-date and integrated transportation techniques, technologies, and applications reduces information exchange and communication times while also laying the framework for cross-company planning and management. Across the whole supply chain, these focused collaborative operations reduce planning, handling, and transportation efforts, positively improving various lead time components such as transportation and manufacturing time (Julia Christine Bendul, 2012).

Logistics and supply chain management are not new concepts. Since the creation of the pyramids to alleviate hunger in Africa, the principles underpinning the successful flow of materials and information to meet the needs of customers have remained largely unchanged (Christopher, 2011). Logistics refers to the precise coordination and execution of complex activities. Logistics, in a broad sense, is the coordination of commodity movement from point of origin to point of consumption to fulfill the needs of customers or organizations. Physical commodities such as food, materials, animals, equipment, and liquids, as well as abstract resources such as time and information, are all regulated in logistics. The logistics of physical commodities include

information flow, material handling, production, packing, inventory, shipping, warehousing, and, in some situations, security (ibid).

On the other hand, the description is given by Johnson and Wood in Tilanus (1997) uses five keywords to define logistics, inbound logistics, materials management, physical distribution, and supply-chain management. Logistics refers to the movement of goods and products into, through, and out of an organization. Inbound logistics transport material collected from suppliers. Materials management refers to the flow of materials and components within an organization. Physical distribution is the process of transporting items from the end of the production line to the customer. Finally, supply-chain management is a step up from logistics, as it connects logistics to the user's complete communications network as well as the firm's technical staff.

According to the Council of Logistics Management, logistics is "a component of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption to meet customers' requirements" (1991). Logistics refers to the complete process of commodities and products moving into, through, and out of a company. Inbound logistics refers to the movement of commodities received from suppliers. The flow of materials and components throughout a company is referred to as materials management. The transportation of goods outward from the end of the production line to the client is referred to as physical distribution. Finally, supply-chain management is a little bigger than logistics, and it connects logistics to the user's entire communications network as well as the firm's technical team more directly. In military uses, early allusions to logistics as a term can be discovered. The French have a third method, which they refer to as logistics, which is the art of moving and quartering troops Galindo, (2016).

Initially, logistics was thought to be a military activity concerned with getting soldiers and weapons to the front lines of battle, but it is now recognized as an important part of a company's manufacturing process for transporting raw materials, semi-finished items, and finished goods to market and customers (Kumar and Shirisha, 2014). According to current definitions, logistics is the process of moving and handling goods and materials from the beginning to the end of the manufacturing process, as well as the sale process and waste disposal, to satisfy customers and

boost company competitiveness. It is the process of anticipating customer needs and wants, acquiring the capital, materials, people, technologies, and information required to meet those needs and wants, optimizing the goods- or service-producing network to meet those demands, and utilizing the network to meet customer demands on time (Tilanus, 1997). Simply put, logistics is the management of operations that are focused on the consumer. Order processing, inventory management, shipping, handling, and packing, as well as facility network architecture, have all been documented as having a substantial impact on customer satisfaction (Chiarini, 2015). According to several studies, businesses adopt a range of strategies to increase their performance. According to Bagshaw (2017), one of the ways that firms must use to improve their performance is logistics management.

Since operational success had a beneficial impact on organizations' financial performance, understanding the relevance of logistics management was crucial for competitive advantage (Tilokavichai et al., 2012). The importance of the "logistics function" in maintaining the seamless movement of resources, products, and information throughout a company's supply chains are increasingly a crucial predictor of business performance (Kilasi et al., 2013). Thus, logistics began as a military operation aimed at delivering soldiers and weapons to the battlefield in time for flight, but it has since evolved into an important part of the contemporary manufacturing process.

The main catalyst for its growth was America's recession in the 1950s, which prompted the manufacturing sector to prioritize product circulation. The term logistics was first coined in the context of military activity in the late 18th and early 19th centuries, and it was popularized by World War II military logistics. The name is thought to have originated from the Greek logistics, which means "skilled in calculating." (According to BTRE, 2001) The supply, transportation, and quartering of troops in a set are usually included in military terminology. Now, several studies have been conducted and logistical applications developed ranging from military to business activity.

2.1.7 Transport and Logistics Supply Policy

Given that transportation can bring significant benefits while also creating a slew of negative externalities, effective policies must be devised to maximize the benefits while limiting the drawbacks. The allocation, planning, and building of transportation infrastructure and services must be carefully planned by both public and private groups. Policies and planning must be distinguished because the former usually relates to aims and objectives and the latter to specific activities. Because policies and plans must reflect fundamental changes in society as well as present obstacles and problems, they are always altering.

A shift in public policy, for example, has resulted in deregulation in various transportation businesses. The safety and security of transportation have gone to the top of the priority list. Natural and man-made disasters pose considerable transportation planning challenges (Stopher, P., and J. Stanley) (2014). Due to their engagement in a wide range of scales and modes, from local public transportation to global ocean shipping, transportation systems are generally partitioned. It's tough to reconcile viewpoints such as pedestrian mobility issues or a freight forwarder's choice of air cargo hubs. Multidisciplinary approaches to transportation geography remain at the center of transportation geography since modes of transportation are both autonomous and reliant on different dimensions. Transportation is impacted by several concerns and forces of change, including sustainability, congestion, governance, and technology. Traditional approaches that focus on a small number of elements must give way to more sophisticated analysis and solutions as the transportation industry becomes more complicated. Furthermore, as a result of the increase in urban freight distribution and the establishment of global supply chains, difficulties related to freight mobility are becoming more essential within the field R. Cervero and G. B. Arrington, (2008).

In the transportation sector, public planning, and research institutes, the scope for transportation geography remains diverse. The same forces that have influenced transportation networks in the past will undoubtedly influence future networks, but it remains to be seen which technologies will triumph and what impact they will have on the spatial structure. Downes, A. (1962). Given that cities are home to a growing share of the world's population, urban transportation issues are crucial to maintaining passenger mobility in major cities. Transportation in cities is exceedingly complicated because of the multiple modes of transportation, the numerous sources and

destinations, and the volume and variety of traffic. Cities have traditionally been seen as sites for the most intensive human connections, with complicated traffic patterns linked to commuting, commercial transactions, and leisure/cultural activities. Cities, on the other hand, serve as crossroads for production, consumption, and distribution, all of which are entwined with freight transit.

The city's shape and structure are conceptually interwoven with its transportation system. The authors of this article are M. Batty and Y. Xie (1994). Urban transportation, especially in high-density areas, is an important facet of mobility. Economic integration, as well as the dispersion of production systems as a result of outsourcing and offshoring, are interconnected and have aided the formation of global commodity chains, from the extraction of raw materials to final consumption. This needs a solid understanding of logistics as well as greater integration of production, distribution, and consumption. (ed.) Bookbinder J.H. (2012).

2.1.8 The role of transportation in logistics Performance

As a result of increasingly regular and successful worldwide trade, the development of logistics has a growing impact on the economy's advancement. When the economy grows, both output and consumption grow, boosting transportation demand, according to Brewer, P., and Speh, T. (2000). A well-managed logistics system improves organizational efficiency and competitiveness while reducing logistical costs and increasing product revenues. Because transportation plays such an important part in logistics, effective transportation management is essential for minimizing logistics costs. The ability to move items, or the availability of transportation services, is crucial to the growth of exchange or market economy, in which goods are transferred from points of production to points of sale and consumption Williams & Fair (1981).

Transportation encompasses a wide range of operations involving the efficient movement of people and goods. Because the delivery of goods and the provision of ancillary services are both important aspects of logistics (Grabara et al., 2014). The transportation system is the most important economic activity among the components of commercial logistics systems. It establishes a physical link by transporting and storing production inputs, as well as an outbound logistical link by transporting and storing finished goods to customers (Sabry, 2015). Transportation is an essential component of the logistics chain because it is involved at every stage, from product development through final delivery to the required location.

Transportation is a vital service that connects a company to its suppliers and customers by moving goods from where they are sourced to where they are needed (Reddy and Jayam, 2016).

Transportation is a key and important sub-function of logistics that ensure that commodities are used at the right time and in the right place. Transportation management is the backbone of the entire supply chain, allowing the well-known seven Rs to be met: the right product in the right quantity and quality, at the right place, at the right time, for the right customer at the right price (Kumar and Shirisha, 2014). Transportation connects the numerous processes that result in the conversion of resources into valuable things for the final user. Business logistics refers to the integration of all of these processes and sub-functions into a product transportation system to reduce costs and improve service to customers (Tseng et al., 2005). Mode of transportation, fleet size, route selection, vehicle scheduling, and freight consolidation are all aspects of transportation management. All four regions are economically interrelated and should be developed as a whole to maximize value (Reddy and Jayam, 2016). The five modes of transportation available to the corporation when moving things to its warehouses, dealers, and customers are road, rail, water, pipeline, and air (Kotler et al., 2005).

Transportation is required for the logistics operational procedures as a whole. It plays a crucial role in bridging the gap between various processing processes. Raw materials, for example, are transported from the point of production to the processing sectors. It can be operated in a variety of ways during the production process, such as with conveyor belts. At the end of the business process, transportation is still required to transfer things from producers to wholesalers and retailers.

Transportation expenses make up a sizable component of total logistics costs. The cost of transportation demonstrates the relevance of transportation in logistics activities. Transportation is essential because no modern company can move its raw materials or finished goods without it. The financial hardship inflicted on many enterprises as a result of calamities such as a statewide railroad strike or independent truckers refusing to transport goods due to fee disagreements underscores the importance of this issue. In these circumstances, markets cannot be served, and products build up in the logistical pipeline, degrading or becoming obsolete. According to Sloggett and Woods (1989), transportation is a crucial consideration when determining where to locate a

new firm or industry. Two transportation objectives are often considered when determining where to locate a business: 1) affordable transportation; 2) excellent transportation service as a result, in any logistical activity, transportation is critical.

2.1.9 Effects of Transportation Facilities on Logistics

Transportation is a crucial link between the many activities that lead to the conversion of resources into useful things for the end-user. Business logistics is the concept of combining all of these operations and sub-functions into a goods-movement system to save costs and improve customer service. The system must be successfully administered once it has been installed. 'Fair et al.' is a group of researchers who devised a novel method (1981), Production, storage, transportation, wholesaling, and retail sales were traditionally handled by separate entities; however, transportation is handled by production/manufacturing plants, warehouse services, and merchandising companies.

Materials, components, and supplies were assembled in production or manufacturing plants, with or without internal storage, processing, or material handling. Warehousing services between plants and marketing outlets required separate transportation. Merchandising companies finished the chain by delivering goods to clients. The producers concentrated on product development and distribution, delegating marketing and distribution to outside firms. Warehousing and storage are services that are used in both the manufacturing and distribution processes. There have been major changes in the number and location of facilities as a result of the closure of numerous single-user warehouses and the growth of consolidation facilities and distribution hubs. The ability to deliver goods swiftly, safely, economically, and reliably (logistics) is important for a company's performance, as well as a country's wealth and ability to participate in the global economy (Fekadu, 2013).

These shifts are the result of several factors, including better transportation services and pressures to improve logistics performance. The role of transportation in the logistics system is more complex than merely moving goods for the proprietors. Only top-notch management can fully understand its intricacy. To meet client needs, goods could be delivered to the right place at the right time via a well-managed transportation system. It boosts effectiveness while also bridging the gap between producers and customers. As a result, transportation is the bedrock of a company's logistics efficiency and economics, and it broadens the scope of the logistics system's

other responsibilities. Furthermore, a good transportation system that executes logistical responsibilities improves not only service quality but also the organization's competitiveness.

2.1.10 Transportation Distance and scheduling

The fundamental consequences of geography are distance and movement. Distance is the most basic element that influences transportation costs. The more difficult it is to exchange space for money, the more significant distance friction becomes. It can be quantified in terms of length, time, money spent, or energy consumed. It varies a lot depending on the form of transportation and the efficiency of different routes. Because landlocked countries do not have direct access to maritime shipping, their transportation costs are sometimes doubled. Multiple rate zones, such as one for local, one for national, and one for exports, can be used to examine the impact of location on cost structure. The transport time component is similarly important because it is tied to the transportation service element. Transportation time, order time, timeliness, punctuality, and frequency are all things to think about. Container transportation between several North American and Pacific Asian ports, for example, could be provided by a maritime transport business. With a port call every two days, it may take up to 12 days (transport time) to service two ports across the Pacific (frequency). To reserve a space aboard a ship, a freight forwarder must call at least five days ahead of time (order time). A ship arrives at 8 a.m. and leaves at 5 p.m. (timed) for a certain port terminal, with a six-hour average delay.

2.1.11 Costs of Transportation

Transportation networks must increase capacity while cutting transportation costs. All users (individuals, businesses, institutions, governments, and so on) must negotiate or bid for passenger and freight mobility since suppliers, distribution networks, tariffs, salaries, locations, marketing tactics, and fuel costs are constantly changing. The cost of doing business includes the costs of gathering information, negotiating, and enforcing contracts and transactions. All agents try to reduce transaction costs because they account for a growing share of the economy's resources utilised. N. Afraz and colleagues (2006). People and freight are regularly routed through the transportation system, and corporations and individuals are frequently faced with the issue of selecting how to route them. As a result of rising income and increased mode availability, passengers' options have considerably expanded.

The creation of light and high-value consumer goods, such as electronics, as well as less bulky manufacturing techniques, has expanded the locational options for freight production and distribution. It's unusual for transportation costs to account for more than 10% of a product's total cost. This percentage is also linked to personal mobility, as households spend roughly 10% of their income on transportation, which includes car ownership, which has a complex cost structure. As a result, choosing a mode of transportation to transport passengers and freight between origins and destinations is crucial, and it is influenced by a number of factors, including the nature of the goods, available infrastructure, origins and destinations, technology, and, most importantly, the distances between them. They categorize transportation expenses as a whole. N. Afraz and colleagues (2006). The charges that transportation service providers undertake internally are known as transport costs. Fixed (infrastructure) and variable (operational) expenses are governed by a variety of factors such as location, infrastructure, administrative barriers, energy, and the manner of passenger and freight transit. Three major elements determine transportation costs: transactions, shipments, and distance friction. D.J. Bowersox, E. Smykay, and B. LaLonde (1968)

2.1.12 Time and Costs of Transportation

Transportation costs and services vary widely, resulting in major pricing and service discrepancies around the world. A transportation service's cost includes not only the user's direct out-of-pocket expenses, but also the time costs and costs associated with potential inefficiencies, discomfort, and risk (e.g. unexpected delays). On the other hand, economic actors frequently select a mode of transportation or a route based on only a percentage of the overall transportation cost. Short-run marginal costs, for example, have an impact on drivers.

When evaluating the price aspect in mode choice, many transporters or freight forwarders are predominantly impacted by direct money costs. They may reduce the cost of a single car ride to just fuel expenditures, leaving out fixed costs like depreciation, insurance, and vehicle tax. The limiting focus on direct money costs is partly owing to the difficulty of calculating time costs and charges associated with potential inefficiencies, which are often only fully examined after the cargo has arrived. Transportation costs and rates are influenced by a number of factors, according to Bowersox, D.J., E. Smykay, and B. LaLonde (1968).

2.1.13 Transportation Facilities

Transportation is the most important and visible component of any logistic system. Products must nearly always be physically carried from one site to another in order for a transaction to be completed, and transportation is frequently the component accounting for the largest percentage of the total logistics cost. In terms of logistics management, the company's most pressing concern is choosing the optimal transit route to meet customer service demands. Whether the company should use its own carriers or use common carriers, what are the various pricing available, what specific transportation services are offered, how reliable are various common carriers, and what mode of transportation do competitors use are just a few of the topics to consider. As the economy has transformed, factors such as globalization of markets, global economic integration, and the removal of barriers to industry and trade, and increased competitiveness have increased the need for transportation. It is one of the most important infrastructural requirements for the expansion of prospects, as well as a key factor in determining competitive posture (McIvor, 2000).

Transportation, which includes both product transportation and storage services, is one of the most visible components of a logistics organization. It refers to the movement of people, animals, and goods from one location to another. Modes of transportation include air, rail, road, cable, pipeline, and space. The field can be divided into three categories: infrastructure, vehicles, and operations. Transportation is important because it allows people to trade with one another, which is essential for civilizations to develop (Coyle et.al, 2011). Transportation service is usually important when deciding on a means of transport between two locations (Coyle et.al, 2011).

Transportation service includes elements such as dependability, accessibility, and security. These factors are taken into account when picking a model, both in terms of their financial influence and the actual transportation cost. Transportation is an important part of the supply chain, which has become a popular concept among businesses in the twenty-first century. Transportation can be viewed as the glue that keeps the supply chain together.

Transportation is an essential and pervasive part of our economy that affects practically everyone, whether directly or indirectly. Transportation has an impact on the goods we buy, our financial well-being, our mobility, and our environment. Transportation also bridges the gap generated by

regional or local specialization and mass production between supply and demand. The interconnectedness of transportation and large-scale industry emphasizes the importance of effective and efficient transportation in our global economy. Transportation adds value to commodities by making them more convenient in terms of time and location. That is, effective and efficient transportation conveys things to the places and times where they are required.

2.2 Logistics Infrastructure in Ethiopia

Roads, railways, airports, seaports, ICT, and energy generation are all part of the logistics infrastructure (Srivastava, 2006). The logistics system relies heavily on dry ports, freight stations, and warehouses. By connecting producers and customers, market structure adds to the efficiency of freight transportation and logistics systems.

2.2.1 Road Infrastructure

The country's road system has been improving in general as a result of highway and road sector development plans. Apart from urban roads and rural trails and footpaths, the current road system can be classified into three hierarchical functional categories: federal, regional, and rural roads. The Federal and Regional road network is approximately 46,812 kilometers long, with 6,938 kilometers of asphalt/concrete surface (Afro Consult & Trading PLC, 2010). This corresponds to a road network density of 0.57 kilometers per 1000 people, or 41.4 kilometers per square kilometer of land. The weighted mean road density in Africa is 2.6 km per 1000 people, with a density of 58 km per 1000 square km (Asnake, 2006).

With minimal gridding, the trunk road network radiates from Addis Ababa to the regional centers. Because one must pass through Addis Ababa, areas that are close by plane are often hundreds of kilometers away by road. As a result, agricultural freight travel throughout the country from places with excess produce to areas with a shortage is frequently costly (Wubshet, 2011). All regional offices, major cities, ports, and international entry points are well connected by the federal road network. However, all-weather roads now connect only around 30% of rural communities, and many of these roads are in poor condition (Asnake, 2006).

2.2.2 Rail Infrastructure

Although Ethiopia's existing railway line to Djibouti is being renovated, it is in terrible shape, has lost all of its traffic to trucking, and the company appears to have a bleak future. Ethiopian

Railways Corporation (ERC) is a new railway freight service provider. The organization is planning the creation of a modern standard gauge (1435mm) railway system along the country's corridors and trunk lines, with the Addis Ababa-Djibouti corridor receiving priority. The Djibouti line was started in September 2011 and is projected to be operational within four to five years. The new firm will play an important role in future corridor transportation and railway network development across the country. The new railway's share of corridor traffic might easily reach 75% of the foreign trade that will be absorbed in the second phase of the ten-year plan period (Afro Consult & Trading PLC, 2010).

2.2.3 Air Freight

Air transport is a very strategic, relatively efficient, and important mode of transport in Ethiopia for topographic, distance, and special demand and supply factors. The aviation sector in Ethiopia is now handled by the following three entities: (a) the Civil Aviation Authority (CAA), (b) the Airports Administration Enterprises (AAE), and (c) the Ethiopian Airlines (ET). The Ethiopian airports are of three levels: 4 international airports, 14 other concrete or asphalt domestic airports, and over 30 other grass or gravel surfaced feeder airports many of which are being upgraded. Ethiopian Airlines, some 12 other foreign airlines, and 6 small domestic private airlines provide air freight services. The airline provides freight transport services to 17 major local destinations and 9 international destinations. It has 6 cargo airplanes and the recent (2009) annual cargo uplift of the carrier was 117,682MT a year. According to the Management General of the Company, cargo remains an important part of its business, generating about 18% of the total revenue, and is expected to increase by operating 777 freightliners soon (Afro Consult & Trading PLC, 2010). The CAA is encouraging small, domestic, private airlines to expand their service which is going progressively. At present, the Authority has licensed about 27 private airlines 6 of which are operational to provide pesticide spraying, charter flights, and freight transport.

2.2.4 Sea Transport

Ethiopia as a land-locked country owns no seaports and is mainly using the Port of Djibouti for import/export trade. Ethiopia owns a public sea transport commercial enterprise called the Ethiopian Shipping Lines Share Company (ESLSC) under the Ministry of Trade and Industry. It is a modern shipping enterprise operating a fleet of 9 ocean-going vessels of which five are multipurpose general cargo ships, three semi container ships, and one Roll- On-Roll-off vessel,

with a total carrying capacity of over 150,000MT. The company provides trading services to the Middle East and the Red Sea, Europe, the Gulf, Far East, and South Asia. It also charters vessels to supplement its fleet and works hard to promote containerization and intermodal transport handling all the facilitation and freight transport and logistics including customs clearance, and inland transport up to Modjo dry ports of import goods. The enterprise has run a very successful pilot operation on intermodal transport (Fekadu, 2013).

At present, the company handles about 83% of the country's sea-borne general cargo import with own and chartered vessels and operates about 4,000 owned and 200 leased containers. The company's share of export cargo is small because the ships are selected by the importers on the other side of the sea. The Company is planning to buy 9 new vessels with a total capacity of 250,000 MT of which 7 are multipurpose with 28,000MT each and 2 tankers with 83,000MT. The company is using advanced ICT between a headquarter and onboard ships, training its staff in its new DebreZeit center. In Djibouti, the company has started intermodal transport services in two former container buses of Djibouti which have now become the enterprise's dedicated services. At present, about 12 shipping lines serve Ethiopia through Djibouti with 19 weekly. On the other hand, no international shipping line directly serves Ethiopia except the Ethiopian Shipping Lines. The other big liners have hubs in areas like Yemen and Singapore where the Companies move their huge vessel capacity from and to major international O/D and provide feeder services to Djibouti (Fekadu, 2013).

2.3. Theoretical Literature Review

Literature pointed out that the advance in different theories is the fundamental foundation of business studies (Lagat, 2013). The theories which logistics literature explored are mobility theory, system theory, and the Actor-network theory (ANT). These theories describe logistics and transportation activities in different views and no one of them can be considered right and the other is wrong (Holldorsson et al., 2007). However, among those theory mobility theory is well-described transport to provide quantitative information to make our mobility smarter concerning our environment.

2.3.1 Systems Theory

As indicated by Baker et al. (2006), the Total Logistics Concept (TLC) extends to treating the various components that go under the general class of distribution and coordination as one single incorporated framework. It is the acknowledgment that the interrelationships between various components, for instance - conveyance, stockpiling and transport should be considered inside the idea of a more extensive inventory network. In this manner, the aggregate framework ought to be viewed as and not only an individual component or sub-framework in disengagement. A comprehension of the aggregate logistics concept is particularly imperative when getting ready for any part of distribution and coordination of operations. The total logistics concept viewpoint could be disregarded at some significant cost. Thus, along these lines, trade-off analysis turns out to be an imperative component of making logistics operations execution arrangements.

2.3.2. The Actor-network theory (ANT)

The ANT defines the existence of everything in the social and natural worlds and asks for interconnected through several types of complexes and aligned relationships. Everything in this system can be affected by factors internally or externally, forming a complex relationship between the variables within the ecosystem (Crawford, 2020). The forces between people in a social system do not exist in dependently, meaning people determine what relationships end interactions they have within their social system. In logistics, customers' influence each other through different media, making businesses recognize trends and demands from the customers, thus offering them specific services to meet their demands. There are innovations in technological developments that are influenced by social pressure and demand from the customers, which makes businesses transform the way they offer their services to meet the customer needs. This theory is relevant because it will help to understand how technology in logistics and supply chain has been influenced by both the demand from the customers and the need for effectiveness and efficiency by the businesses. It helps to understand the delicate relationship between producers and consumers and the interaction with technology, especially from the point of view of the demand origin of such interactions.

2.3.3. Transportation (Mobility) theory

This research was motivated by a desire to learn more about how transportation influences opportunity. It took the instance of Medellin, how the Metro cable system can assist alleviate poverty by increasing revenue and improving the local community's living conditions. Mobility

has evolved from a luxury to a generalized necessity and heavy burden in modern society, to the point where it has been proposed as a new paradigm for social organization (Urry, 2007), under which mobility has evolved from a luxury to a generalized necessity and heavy burden; being in motion, whether real or virtual, has become a demanding and stressful requirement (Bauman, 2000). Today's luxury, according to Bauman, is the capacity to evade the obligations of perpetual movement. As Bauman points out, increased mobility does not homogenize society; rather, it stratifies and diverges it, allowing some people to function at a distance, free of any physical ties, while imprisoning others in one area. Much of the sociological research on mobility has focused on wealthy Western cultures' hypermobility and the importance of mobility for economic opportunity and human liberty (Ohnmacht et al., 2009; Freundal-Pedersen, 2009; Social Exclusion Unit, 2002). The poor in less-developed countries have a restricted amount of journeys they can take due to their low salaries, reducing their chances of becoming less impoverished. Ureta (2008) discovered that people's ability to travel by foot was limited, while the high cost of public transportation with family income limited people's movement patterns to the bare minimum in his study of the effects of transportation costs on people living in Santiago de Chile's poor periphery (work and education). As a result, people's opportunities to widen their professional horizons, participate in social and leisure activities, engage in political and civic involvement, and so on were limited. As a result of a lack of mobility, geographic marginalization produces social isolation. In a novel approach, lack of mobility contributes to social imbalance. Mobility gives the traditional (vertical) stratification of society based on wealth, income, education, and position a "horizontal" dimension, further fragmenting and accentuating existing social disparities based on age, gender, ethnicity, and lifestyle (Ohnmacht et al., 2007). The young, aged, infirm, and ignorant are all more vulnerable as a result of hypermobility. Furthermore, mobility is inextricably related to cutting-edge technology and its adoption, as well as new forms of surveillance, all of which have profound cultural implications in terms of "creating flows of meaning" and "cultures of movement" in daily life (Olsen, 2009). Of course, neither transportation infrastructures nor social environments are level and uniform. Kaufman et al. (2002, 2004) consolidated the notion of motility, or the actual or potential ability to move, and its importance in various socio-spatial contexts in order to highlight the social and cultural variability of contexts. They argue that mobility is a new sort of capital whose appropriation necessitates the following:

- Access: the range of possible mobility, limited by options (available transportation and communication systems) and access conditions, based on location, time, and other contextual constraints (costs, logistics, and other restrictions).
- Competencies: physical, cognitive, and organizational skills and talents that are linked to access and appropriation, either directly or indirectly.
- Appropriation: how individuals, groups, networks, and institutions perceive and respond to those options; encompasses wants, ambitions, and aspirations, as well as motives, techniques, and ideals.

2.3.4. Mobility and travel behavior

The most evident benefit of the cable cars was improved mobility in terms of shorter journey times and increased comfort. For example, under perfect conditions, a cable car/Metro excursion 10 kilometers from and 350 meters above the city center can be accomplished in 20 minutes. It was learned, however, that this assumption must be qualified carefully. To begin, traveling to the cable car/Metro system takes a considerable time, ranging from 0 minutes during off-peak hours to more than an hour during peak hours. Second, travel patterns must be taken into account, with the commute to work being especially linked to places outside of the city core. Last but not least, the tariff structure is crucial. Cable car use is cost-effective for long excursions necessitating a transfer to another mode of transportation thanks to the combination fee, which comprises a single ticket for cable car/Metro + bus (savings of 33 percent compared to two bus journeys). When waiting and walking times are included, a regular bus can be slightly cheaper and faster for non-transfer trips, such as to the city center. In the influence region, the cable car/Metro is used for less than 10% of journeys (as defined by local administrative boundaries). The bulk of cable-car riders is formal-sector employees with extensive journeys north-south. There is minimal evidence that increasing the number of non-essential journeys leads to increased city involvement.

2.3.5. Urban mobility impacts

Precision measurement of the impact of the Medellin cable-car systems is difficult for two reasons. To begin with, as previously said, impacts are defined by a constantly changing socio-

spatial context, rather than being direct and mechanical. Second, in the city's informal sectors, data is scarce, making even assessing trends, let alone attribution of causality, challenging. Estimating the impact of cable cars on the local economy, family incomes, or house prices, for example, is complicated by a lack of official data as well as short-term economic cycles, fluctuations in the level of internal violence, displaced-person migration flows, and other urban, economic, and social programs. The cable-car networks, on the other hand, were created concurrently with urban improvement projects (PUIs), making it even more difficult to distinguish between transit and general improvement. This is true for purely qualitative phenomena such as the impact of cable cars/urban improvement on community pride, self-esteem, urban integration, and social inclusion.

2.4. Empirical Literature review

2.4.1 Impacts of Political and Legal Aspects

While much international trade is currently conducted door-to-door, under a sole contract, and with single party bearing the contractual responsibility, the current legal structure governing multimodal transportation fails to adequately reflect these changes. There is currently no international consistent rule in place to govern liability for multimodal transportation-related loss, damage, or delay. Instead, the current legal framework for multimodal transportation is made up of a jumble of international conventions covering unimodal carriage, regional/sub regional agreements, national laws, and standard term contracts. As a result, the applicable liability laws, as well as the degree and scope of a carrier's liability, are highly variable and unexpected from case to case.

Several attempts to draft a set of regulations to regulate responsibility arising from international multimodal transportation have been made throughout the years, but none of them has resulted in international uniformity. Because there is no international universal liability regulation, there has been a profusion of national, regional, and sub-regional multimodal transportation laws and regulations. Due to the lack of a global uniform regime, developing countries have had to rely on regional and/or sub regional solutions.

2.4.2 Impact of Infrastructures

Transport expenses are directly affected by the efficiency and capacity of modes of transportation and terminals. Higher transportation costs, delays, and negative economic implications are all results of poor infrastructure. Because better established transportation networks are more reliable, linked, and capable of handling more movements, they tend to have lower transportation costs. Because each mode has its own capacity restrictions and operational requirements, different modes have varying transportation costs. One of the most important considerations is the suitability of modes based on the distance traveled and the nature of the cargo being transported. When two or more modes compete directly for the same market, the consequence is frequently decreased transportation costs and the creation of niches. By permitting relatively small transport units (containers) to be carried in basified loads, containerized transportation allowed for considerable reductions in freight transport rates around the world.

The economy has given the logistics sector infrastructure, such as cold chain and warehouse facilities. As a result, more funding will be available for all logistics segments at competitive rates, driving up the cost of exports. This will make it easier to build the logistics sector at more competitive prices, and Indian goods will be less competitive on the global market as a result. Singh, A.P. and De, N. (2017) (2017). Following the implementation of GST, the tax on warehousing, storage, and other labor services went from 15% to 18%. As a result of the high degree of value addition where input tax credit might be claimed, the 3PL provider would have a greater incentive. Entry into different states would be simplified, and transportation costs would be decreased. A.P. Singh, A.P. Singh, A.P. Singh, A (2017).

2.4.3 Impact of Peace and security

The logistics chain's security necessitates a collaborative effort between the public and commercial sectors. The government is responsible for providing the infrastructure and services required to provide an appropriate degree of physical security (security) and the proper operation of transportation infrastructure services (safety) in both normal and emergency situations. Meanwhile, the private sector is in charge of putting in place the internal security measures and

assistance required to ensure proper risk management and process operation. Private solutions to the problem of lack of security, such as escorts, checkpoints, or armed guards in transportation, among other unilaterally implemented alternatives, have proven ineffective precisely because of the unilateral nature of the approach, frequently getting in the way of other initiatives and contributing to higher logistics costs, with negative social and economic effects on the region's inhabitants, who ultimately bear the cost of the service.

Logistics security is linked to an economy's competitiveness because, in addition to direct losses from crimes, there are costs associated with dealing with the incidents (attorney fees, delays in collecting insurance, to name a few), as well as significant national productivity losses, which result in higher export prices, lowering the economy's competitiveness. In 2007, estimated losses due to crimes against logistics networks totaled roughly 5% of worldwide trade, with the International Cargo Security Council (ICSC) estimating losses in Europe alone at almost US\$ 15 billion per year.

2.4.4 Impact of Inflation

Inflation and interest rates are macroeconomic factors that have an impact on the whole economy in logistics. Know that macroeconomics is the studies of the basic economic elements that influence growth and the performance of key markets. Inflation and the base interest rate are two examples, and macroeconomics is concerned with how these elements interact to influence the economy's structure and behavior as a whole. The performance of the manufacturing sector is possibly the single most important indication from a headline standpoint. Because the haulage and logistics industry is centered on the local or international shipment of commodities, a strong supply of items is usually associated with increased growth in the logistics sector.

2.5. Research Gapes

This study differs from others in that it considered the impact of transportation management methods and mobility (transportation) alternatives on logistics in a specific company's commercial operation, namely the PAVE Logistics Company in Addis Ababa. As a result, this study aimed to address the critical issues with transportation facilities, as well as the challenges

that transportation logistics and management face at PAVE Firm as a result of their roles as key aspects of the company. As a result, this research considered the interaction between the transportation facilities used and the logistics options available, as well as the impact this has on the critical functions of transportation in enhancing the performance of the company's transportation system.

However, the purpose of this paper differs by its impacts, which include the cost of service, speed of transport, flexibility, nature of the commodity, regularity of service, safety, and security. To the best of the researcher's knowledge, no studies in logistics with a similar title have been conducted at the PAVE Company, indicating a research gap in the field. The study's logistics are meant to be completed on time and within budget, with a high level of preparedness for any issues that may develop. This institute-initiated logistical schedule is included in my study's schedule, but the possibility of these gaps is not being addressed and coordinated. As a result, the ground truth of the research was that the study target region was not completed within the logistical schedule's deadline. The optimum conditions for the study, according to the researcher, were to have the plan carried out according to the schedule's deadline. As a result, the time gap between what happened in the study and what needs to be done is in the logistical timetable, which began with the institute's schedule. Furthermore, no study on this topic tackles the shortcomings listed above, according to PAVE Company. The purpose of this study was to examine and evaluate transportation choices and their impact on logistics performance, as well as to determine how those attributes are linked to transportation factors. To address this issue, a poll of PAVE logistics experts looked into the concept of transportation success and defined and determined the components of success characteristics.

2.6 Conceptual framework

The conceptual framework is a research project design that assists the researcher in conceptualizing the study, describing and operationalizing the dependent and independent variables, and ensuring that data collection, processing, analysis, and interpretation are straightforward and meaningful.

Cost of service is at the core of organizational performance since a company is deemed to be performing if its bottom line is healthy. The bottom line is determined by two factors: cost and revenue. When a company is profitable, it shifts from cost to performance or from failure to success. Consequently, the primary goal of every corporation is for it to be profitable. Being profitable aids an organization's ability to raise enough money for both expansion and survival during trying times.

The geographic area from which supplies can be sourced and the potential market for sales may both expand with higher average speeds. A broader supply area may imply better and/or more affordable inputs. Greater production at a given facility results from a broader market region, which increases productivity. Additionally, it enhances connections to and access to the freight network.

The ability to scale and adapt within a given system to increase the efficiency of shipping a procedure is referred to as flexibility in logistics. Delivery methods, features, and services that can all be improved with technology but not just by technology are all examples of flexibility. Businesses can enhance the customer experience and increase customer loyalty by concentrating on the fundamental components of flexibility: delivery models, functionality, and services. Organizations will be able to compare their Key Performance Indicators (KPIs) to actual data using TMS and SaaS systems to find quick wins in process improvement.

Regarding the regularity of service, railway service is more steady and reliable than any other mode of transportation in terms of frequency. Due to fewer barrier stocks, an increased likelihood of on-time delivery lowers both manufacturing and distribution costs. Predictable transit times lead to more effective scheduling and better use of the truck and driver. Additionally, it lowers the price of dependable and consistent service and increases the likelihood of delivery on time due to the fact regularity of service is one of the selected variables that may affect the performance of the company.

The mode of transportation selected is also influenced by the safety and security of the cargo while it is en route. The goal of safety and security operations in logistics is to make it easier to

safely manage and move people, commodities, information, and other resources from one location to another. As a result, if the movement of commodities is unsafe and unreliable, the company

A traded good or raw resource, such as grains, coffee, or ores, is referred to as a commodity, and it serves as the main performance indicator. Since the commodity was not provided safely and securely recently, the company's performance was negatively impacted.

Independent variable**Dependent variable**

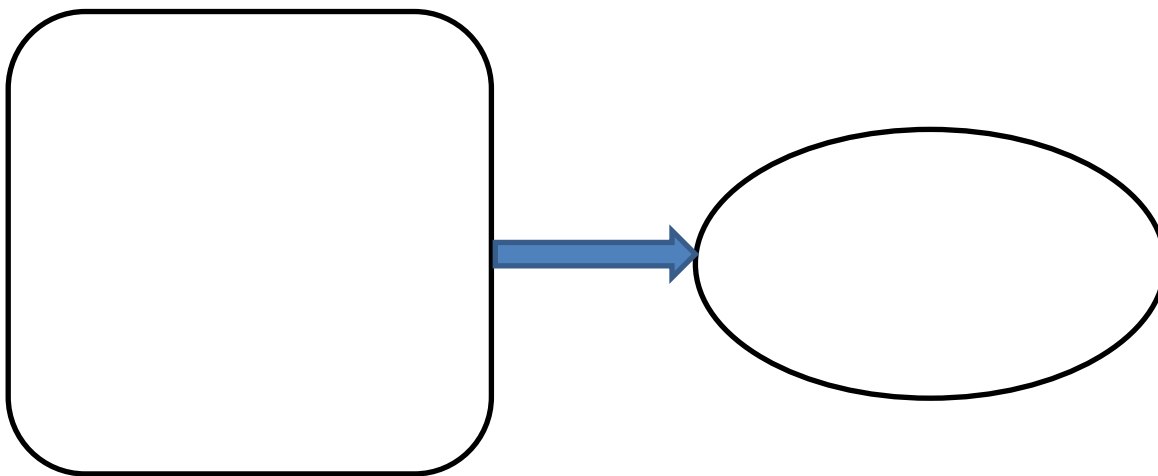


Fig. 1 conceptual framework for the study

Source: own construction based on literature (2022)

CHAPTER THREE

3. METHODOLOGY OF THE STUDY

Introduction

In this chapter, the study's methodology is presented. A framework for doing design research that comprises an approach as well as a set of supporting methods and principles is known as a research methodology. The study technique covers the research concept, target population and sample, data collection procedures, data analysis procedures, and intended output, among other things (Mugenda, 2003). As a result, the research methodologies, as well as the study design, data source, demographic and sampling procedures, data collection methods, data analysis, data validity and reliability, and ethical issues, are described in this chapter.

3.1. Research Design

Research design is the planning of the methods to be used for collecting relevant data as well as the methodologies to be employed in their analysis, all while keeping the research in mind. The overall goal of the design was to reduce bias and improve the consistency of the data collected and processed (Kothari 2004). A descriptive and explanatory survey guided the inquiry. According to Adams, Khan, and Raeside (2007), descriptive research focuses on analyzing a phenomenon rather than illuminating underlying behavior.

Research efforts have been taken for a variety of reasons. Descriptive and explanatory are the two categories. Using a descriptive and explanatory research design, this study analyzed the primary success variables in the selected sector of transportation and logistics. The study also used an explanatory research design to describe the current state of events at the time of the investigation, as well as to explain the relationship between variables that are correlated to analyze the factors' combined influence on logistical performance. The descriptive study focuses on describing a person's, environment, or group's features. The purpose of this study was to see if specific variables are linked (Kothari, 2004). Accordingly, the study's purpose was to figure out the link between logistics performance and the factors affecting transportation choice. As a result, it is determined that the descriptive research design is appropriate for the study. When data was

collected from respondents at a single moment in time, descriptive is acceptable. Using a standardized research instrument, a survey design collects data from a sample or the complete population. A structured questionnaire was used because the study's purpose was to describe perceived service quality, necessitating the use of a survey design.

3.2 Research Approach

The data for this study was collected and analyzed using a mixed-methods approach (qualitative and quantitative). Hence, a mixed-methods strategy allows the researcher to collect more relevant evidence and data than if they only used one method. To acquire a thorough grasp of the logistical performance factors: its major operations, contribution to enhancing private mobility and the city's environment, and limits, a qualitative method will be employed. To collect qualitative data, structured questionnaires were used. With the use of questionnaires received from project workers, this study has taken a quantitative approach. Quantitative analysis methods aid in the discovery, presentation, description, and study of data connections and trends (Saunders et al, 2009).

A quantitative technique was used to measure and visualize the relationship between variables. In a cross-sectional study, the goal of the survey was to collect data on logistics performance and transport determinants, private transportation job activities, and respondents' impressions of logistics implementation (targeting, expression of opinion, creation of logistics awareness among employees, team leaders, drivers and managers of the logistics company). Questionnaires were designed to be effective due to the relative ease of obtaining standard data necessary for achieving the study's objectives. Based on the identified performance indicators, survey questionnaires were designed.

3.3 Target population

Because the study's purpose was to examine factors affecting transportation choices and their impact on logistics performance in Addis Ababa in the case of pave logistics company, the study's target demography includes employees and other stakeholders who are currently participating in and carrying out the logistics. A population is the whole set of elements from which you want to conclude (Stillwell and Clarke, 2011). The researcher can use his or her judgment to select cases that best answer the study objectives through deliberate or judgmental sampling (Saunders et al.

2009). The study focused on a private logistics firm based in Ethiopia. The research focused on the company's headquarters of 252 people, in Addis Ababa city. The researcher used the availability sampling technique to plan those logistics; probability sampling was found to be convenient for the researcher in terms of both geographic location and data availability.

3.4 Sample Size

Using Cochran's (1977) sample selection algorithm, random samples of 155 respondents were picked from the overall calling population for the customer sample size (used for infinite population or where the population was greater than 50,000). The confidence level of 95 percent, two-tailed, and a confidence interval of 5 (margin for error) were utilized to determine the sample size. The researcher utilized the method for a large population to choose the sample, and the final sample size was computed using Slovin's sampling formula Yamane (1967).
$$n = \frac{N}{1+N(e)^2}$$

Where;

- n= sample size
- N= total target population
- e= Margin of errors/error margin i.e., 0.05 (5%)

$$\begin{aligned} n &= \frac{252}{1+252*(0.05)^2} \\ &= 155 \end{aligned}$$

Therefore, 155 representative sample elements are the sample of the study.

3.5 Sampling Techniques

The researcher had chosen one of Addis Ababa's offices for its initial deployment. The examination was limited to the Addis Ababa office of Pave Logistics Company. A total of 155 PAVE personnel and employees were chosen for the investigation. Probability sampling was used to make selections using a sampling technique.

Table 1: Sample size in the PAVE Company

S/n	Sources of Population	No. of Total Populations	sample size ($n_i = (N_i/N) * n$)
1	Permanent employees of PAVE company	112	69
2	Vehicle operators of PAVE company	140	86
Total		252	155

Source: PAVE logistics Company profile (2022)

Where: N = Total Population

N_i = Populations of each source

n_i = Required samples from each source

n = Total sample size

3.6. Data Sources

The data for this study come from both primary and secondary sources. Primary data was acquired directly from respondents using questionnaires. While secondary data was gathered from public sources.

3.6.1. Primary Data Sources

This is the type of information that might be collected in a field of study to answer research questions. Research assistants gathered them in the field to answer a study query or issue (Adam & Kamuzora, 2008). A questionnaire was used to collect the majority of the data for this investigation.

3.6.2. Secondary Data Sources

This study also incorporates secondary data from secondary data sources such as books, journal articles, organizational reports, and publications from various associations and organizations, as well as other documentary reviews from the internet, in addition to primary data.

3.7 Data Collection Tools

For the Pave Logistics service plc respondents, data was obtained using self-administered structured questionnaires.

3.7.1 Structured Questionnaire

During the study, the questionnaire was created to be administered face to face, personally, based on the research topics. Respondents in the study's sites were able to use this tool to answer questions regarding the study. The survey's bulk of questions was closed-ended. The goal of using closed-ended questions was to generate direct, short, and to-the-point responses or reactions. Above all, this method was said to be effective in the field of research since it is inexpensive, free of interviewer bias, and respondents could provide exact and unambiguous responses.

3.8 Data Processing

During the data processing phase, the collected data was edited, encoded, categorized, and tabulated. The data was cleaned to look for anomalies, errors, and omissions in the responses, as well as to make sure the questions were answered correctly and equally. A numerical value was supplied to categorize or classify replies into a small number of groups or classes. Data with comparable characteristics were grouped, allowing the data to be classified. Finally, the raw data was summarized and illustrated using tabulation figures and descriptive explanations. Statistical Packages for Social Scientists (SPSS –version 20) is a program that converts processed data into patterns and relationships between and/or within data groups using descriptive, explanatory, and inferential statistical analysis.

3.9 Data Analysis

The information gathered from questionnaires was analyzed using descriptive, qualitative, and inferential statistics. Mean scores and standard deviations were used to describe respondents' demographic data and their experience with automated queuing. To describe the perceived logistics quality of mobility, descriptive statistics are utilized. The association between logistics performance and factors affecting transportation choices was analyzed using correlation and regression analysis. The following format was used to present the correlation and regression models. Data were analyzed using a variety of data analysis methodologies quickly after data

collection from both qualitative and quantitative approaches, as well as secondary sources, was finished. The use of descriptive statistical data analysis techniques such as a table, frequency, and percentage will be to show unique variables in quantitative data. To be clear, the fundamental justification for employing descriptive statistics in this study was that numerical data looks best in a table.

The attitude questions were also graded using the Likert scale. The Likert Scale comprises two elements, according to Churchile and Icobucci (2005) and Obsiye (2012), as quoted by Amelework (2014): item portion (such as product, event, or attitude) and evaluative part (categorical responses from strongly disagree to strongly agree). Similarly, the variables in this study that may be used to gauge client attitudes about private PAVE logistics were created by the organization using a five-point Likert scale. Scales like this include strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5).

3.10 Data presentation

The data were presented using a descriptive design that contains frequencies, percentiles, means, and standard deviations.

3.11 Model Specification: Ordinal Logistic Regression

You can use the ordered logit if the dependent variable contains ordered categories (i.e. the order of ranked variables is meaningful but the distances between them are arbitrary). The order is much clearer for certain variables than for others, but it's always vital to check if it's the only feasible order or whether there's something else that makes more sense (Sarkisian 2004). According to Williams (2015), there are four alternative approaches to treating the ordinal dependent variable. The first option is to treat the variable as continuous and use standard OLS regression or other continuous variable techniques. The second option was to ignore the ordinality and treat the variable as nominal, i.e. using multinomial logit techniques; the third option was to treat the variable as if it were measured on a true ordinal scale, such as the professorial ranks of Full Professor, Associate Professor, and Assistance Professor, which are ordered but may or may not reflect the crude measurement of some underlying continuous variable; and the fourth option was to treat the variable as if it were measured on a true ordinal scale, such as a result, the dependent variable in this study is treated as a real ordinal scale. A single-item measure was used

to assess performance in this study. On a five-point Likert scale, 'Strongly Disagree,'Disagree,'Undecided,'Agree,'Strongly Agree,The most appropriate econometric estimation method to use is ordinal logistic regression because the outcome variables for respondent response were ordered and categorical (Green 2000). As a framework for assessing ranked responses, ordered logit models have become widely used (Parasuraman et al. 1988).Furthermore, ordered logit models are among the most used ordinal regression techniques, according to Williams (2008); however, the assumptions of these models are frequently violated, and the parallel lines/proportional odds assumption is frequently disregarded. As a result, for the logistics performance at Pave logistics service, this study uses the ordinal logistic regression model and the functional form of the ordered logit model as follows:

$$Y^* = \sum_{k=1}^k \beta_k X_{ki} + \varepsilon_k \quad (1)$$

Y^* is a continuous, unobserved, and unmeasured latent variable whose values determine what the observed ordinal variable Y equals

ε is a random disturbance term with zero mean and a standard normal or logistic distribution: $\varepsilon \sim N(0, 1)$. The continuous latent variable Y^* has various threshold/cut-off points. (κ is the Greek small letter Kappa.). The value on the observed variable Y depends on whether or not you have crossed a particular threshold/cut-off point. Thus, when $M=3$, what we do observe is;

$$\left. \begin{array}{l} Y = 1, \text{ if } Y^* \leq \mu_1 \\ Y = 2, \text{ if } \mu_1 < Y^* \leq \mu_2 \\ Y = 3, \text{ if } \mu_2 < Y^* \leq \mu_3 \end{array} \right\} \quad (2)$$

Where: Y , is observed in j number of ordered categories, μ s are unknown threshold/cut-off point parameters separating the adjacent categories to be estimated with β s. The continuous latent variable Y^* can be rewritten as;

$$Y^* = \sum_{k=1}^k \beta_k X_{ki} + \varepsilon = Z_i + \varepsilon_i \quad (3)$$

The Ordered Logit Model estimates part of the above:

$$Y^* = \sum_{k=1}^k \beta_k X_{ki} + \varepsilon = E(Y^*) \quad (4)$$

Note that, because of the random disturbance term, the unmeasured latent variable Y^* can be either higher or lower than Z . Note also that there is no intercept term. You then use the estimated $M-1$ cut-off terms to estimate the probability that Y will take on a particular value. In this case since $M=3$, the formulas are:

$$P(Y = 1) = \frac{1}{1 + e^{Z_i - k_1}}$$

$$P(Y = 2) = \frac{1}{1 + e^{Z_i - k_2}} - \frac{1}{1 + e^{Z_i - k_1}}$$

$$P(Y = 3) = 1 - \frac{1}{1 + e^{Z_i - k_2}}$$

The cumulative probabilities can also be computed using the form:

$$\text{Prob}(Y = j) = 1 - L(\mu_{j-1} - \sum_{k=1}^k \beta_k X_k)$$

Where: $L(\cdot)$ Represents cumulative logistic distribution

3.12 Validity of the Study

In both qualitative and quantitative research, the term "validity" is utilized. Validitas, which means "strength" in Latin, is the root of the word. It asserts that a conclusion can never be proved; only argued (Trochim, 1999). In quantitative research, validity can be established in a variety of ways. In this context, the term "validity" has a different connotation than it does in qualitative investigations. The term "validity" refers to how well an instrument measures the study question at hand. The questionnaire's items, on the other hand, were designed utilizing a five-point Likert scale closed-ended multiple-choice style. To guarantee the instrument's validity, various SPSS academics and Pave Logistics service plc personnel tested it. Employees will request to view it and evaluate its accuracy.

3.13 Reliability of the Study

The ability of the research instrument to deliver consistent results over time is an issue. The procedure of questionnaire pilot testing (testing and retesting) helped to ensure the questionnaire's reliability in eliciting replies (Cook & Campbell, 1979:37). The most essential instrument for establishing the findings' reliability and internal consistency is Cronbach Alpha Statistics. The Cronbach Alpha result must be larger than 0.70 to obtain a trustworthy scale, and any scale with a Cronbach Alpha of less than 0.70 must be rejected (Sekaran & Bougie, 2013). As a result, the Cronbach alpha test will be used to assess the study's dependability.

Table 2 Reliability Statistics

Number of Item	Cronbach's Alpha
CS	.799
S	.710
F	.706
NC	.792
R	.773
SS	.705
TMS	.739

3.14. Ethical Consideration

The responder was first informed of the study's objective and purpose, followed by a verbal consultation to ensure that they understood the study and were willing to participate. Participants were also informed that they have the option to leave the study at any time. The study was also risk-free because participants are educated about the research's benefits. Finally, participants had the right to explain the question and reject to disclose information at any time during the research process.

CHAPTER FOUR

4. DATA ANALYSIS AND INTERPRETATION

Introduction

This chapter covers the study's data presentation, interpretation, and analysis. It is divided into two parts: the first is the demographics of the respondents, and the second is the data acquired from the respondents via questionnaires. To answer the research questions, 155 questionnaires were developed and given to respondents; 153 of them were filled out and returned, while the remaining two were not.

4.1. Demographic Characteristics of the Respondents

4.1.1 Response Rate

A total of 153 replies were received out of 155 questionnaires sent out, resulting in a response rate of 98.7%. All of the questionnaires were modified and validated for completeness before being included in the data analysis.

Table 3. Gender and Education Level Cross tabulation

Gender * Education Level Cross tabulation											
Count											
		Education Level								Total	
		Certificate/Diploma		Higher/Advanced Diploma		Bachelor Degree		Master's Degree			
		F	%	F	%	F	%	F	%	F	%
Gender	Male	19	12.4	56	37	7	4	10	6.5	92	60
	Female	0	0	37	24	18	12	6	4	61	40
Total		19	12	93	61	25	16	16	11	153	100

Source: PAVE logistics Company profile (2022)

According to Table 3, there were 92 (60%) male and 61 (40%) female respondents. Furthermore, 11% of the respondents have a master's degree. Degree holders made up 16 percent of the respondents, higher/advanced diploma holders made up 61 percent, and certificate/diploma

holders made up the remaining 12 percent. Higher/advanced diploma holders made up the majority of male and female respondents in terms of proportion.

Table4 Work experience and position in your organization Cross tabulation

work experience * position in your organization Cross tabulation															
Count															
		position in your organization												Total	
		General manager		Finance Unit		Human resource		Operation manageme nt		Marketing manageme nt		others			
Work experience	< 5 years	F	%	F	%	F	%	F	%	F	%	F	%	F	%
		0	0	0	0	1	0.65	4	2.6	1	0.65	6	4	12	7.8
	6-10 years	1	0.65	2	1.3	1	0.65	69	45	5	3.2	1	7.2	89	58.2
	11-15 years	0	0	3	2	2	1.3	32	20.9	2	1.3	4	2.6	43	28.1
	>15 Years	0	0	0	0	0	0	7	4.5	1	1.3	1	0.6	9	5.9
Total		1	0.65	5	3.2	4	2.6	112	73.2	9	5.9	22	14.4	153	100

Source: PAVE logistics Company profile (2022)

Table.4 shows that there were four categories of work experience; less than 5 years, 6 - 10 years, 11 -15 years, and above 15 years. Accordingly, the first category accounts for 7.8 % of the respondents, the second category who had 6-10 years of experience was 58.2% of the respondents, the third category 11 -15 years were 28.1% and the last category above 15 years accounts for 5.9 % of work experience. Regarding position in the organization, the table shows that

the current position of the respondents were 1 (0.65 %) general manager, 5(3.2%) finance unit, 4 (2.6 %)human resources, 112(73.29%) operation management, 9(5.9%) marketing management, and 22(14.4%) were others. Moreover, the majority of respondents work in operation management besides, and the large number of respondents who participated in the study have

worked for 6-to 10 years in the organization. This indicates that the work experience of the respondents had adequate exposure to the work area.

4.2. Descriptive Analysis

An interval measurement scale was used to assess Likert scale data, according to Creswell (2007). The composite score for Likert scales should be assessed at the interval measurement scale because Likert scale items are formed by calculating a composite score (sum or mean) from four or more type Likert-type items. Furthermore, assuming the sample is nearly normally distributed, the interpretation for Likert scale values from 1 (Strongly Disagree) to 5 (Strongly Agree) should be "Disagree" for mean up to 2.8, "Neutral" for the mean between 2.9 and 3.2, and "Agree" for mean above 3.2. Cetro (2006). As a result, the 0.8 was calculated by dividing the difference between the maximum (5) and minimum (1) scores by the questionnaire's maximum score (5). The standard deviation was used in the analysis of the data. Small standard deviations (compared to the mean's value) indicate that data points are close to the mean, whereas big standard deviations (relative to the mean) show that data points are far from the mean. The data does not fit the mean well. The standard deviation is a metric for determining how well the mean accurately represents the data (Field 2009). All of the characteristics were evaluated on a five-point Likert scale, with 1 representing Strongly Disagree and 5 representing Strongly Agree. Therefore, the interpretation formed using the mean of each variable falls between the two ranges; if the mean approaches 1, the inference is that the respondents disagree on the raised problem or variable, and if it approaches 5, the opposite is true.

Table 5 which mode of transportation risk is more frequent in Pave logistics service?

Which mode of transportation risk is more frequent				
		Frequency	Percent	Valid Percent
	Road transport	55	35.9%	35.9%
	Railway transport	20	13.1%	13.1%
	Sea transport	23	15.0%	15.0%
	Air freight transport	55	35.9%	35.9%
	Total	153	100.0%	100.0%

Source: Own survey source (2022)

According to Table.5, the paving logistics service used four different forms of conveyance; road transport, railway transport, sea transport, and air freight transport. Accordingly, the first category and the fourth category account for 35.9 % each, and the respondents said that road transport and air freight transport are more frequently have risks, and the rest 15% of the respondents said sea transport is more frequently has risks, and the rest 13.1% of respondent said railway transport is more frequently has risks. Therefore, the response of the majority lies in road transportation and air freight transportation logistics service are more at risk than the other two.

Table 6. How do costs influence the choice of transportation in paving logistic companies?

Descriptive Statistics			
	N	Mean	Std. D
Energy (fuel) costs influence choice of transportation	153	4.08	.786
The labor market for commercial drivers affects the choice of transportation	153	4.07	.779
Demand for freight can influence the choice of transportation	153	4.03	.734
Customer loyalty influences the choice of transportation	153	3.91	.747
Means of transportation capacity affect the choice of transportation	153	3.91	.934
Government regulation on cost determination influences the choice of transportation	153	3.27	.837
Geopolitical events can affect the choice of transportation	153	3.28	.839
Cost of service	153	3.7937	

Source: Own survey source (2022)

Table 6 shows how affects transportation choice in large logistic organizations cost, and the majority of respondents agreed with those questions. The first question in which respondents received a better mean score was the one that asked if it was assumed that energy (fuel) costs influence the choice of transportation which is the mean score of 4.08, and the labor market for commercial drivers affects the choice of transportation which is the mean score of 4.07, demand for freight can influence the choice of transportation which is the mean score of 4.03, customer loyalty influences choice of transportation and means of transportation capacity affect the choice of transportation which are the mean scores of 3.91 each, geopolitical events can affect the choice of transportation which is the mean score of 3.28, and government regulation on cost determination influences choice of transportation which is the mean score of 3.27 besides the average mean for the cost of service had a means a score of 3.79. Accordingly, the analysis shows that cost of service had a means score of 3.79, which almost the score of this variable falls in agree level hence, this variable can be a reason for the performance of transportation choice in pave logistics service.

Table 7 Does speed influence the choice of transportation in pave logistic company?

Descriptive Statistics			
	N	Mean	Std. Deviation
There is a breakdown of transportation	153	3.90	.909
There are shortages of drivers	153	3.01	.928
natural disasters limit the speed	153	3.61	.961
human errors affect speed	153	3.22	.952
Speed	153	3.4346	

Source:

Own survey source (2022)

In the pave logistic company, Table 7 shows how speed affects the mode of transportation chosen. As a result, the majorities of respondents were fairly neutral and agreed with those questions. The first question in which respondents gave a higher mean score was the one that asked there is the breakdown of transportation which a mean score of 3.90, natural disasters limit speed which is a mean score of 3.61, and human errors affect speed which is the mean score of 3.22, and there are

shortages of drivers which accounts 3.01 as well the average mean for the cost of service had a means a score of 3.43. Therefore, the analysis shows that speed had a means a score of 3.43, which is almost the score of this variable falls in agree level hence, this variable can influence the performance of transportation choice in pave logistics service.

Table 8 Does flexibility affects the choice of transportation in pave logistic company

Descriptive Statistics			
	N	Mean	Std. Deviation
Visibility of products	153	3.52	.960
Political climate	153	3.56	.959
Whether condition	153	3.40	.955
Flexibility	153	3.492	

Source: Own survey source (2022)

Table 8 shows how flexibility influences the mode of transportation chosen in the pave logistic company. As described in Chapter 2, Flexibility measures how a given transportation option can operate at any time and can reach the business premises for loading and unloading. As a result, the vast majority of respondents agreed with those questions. The first question, for which respondents provided a higher mean score, was the one implying whether the condition can influence flexibility which is the mean score of 3.40, Political climate which is the mean score of 3.56, and visibility of products which is the mean score of 3.52, also the average mean for flexibility had a means a score of 3.49. As a result, the analysis shows that flexibility had a means score of 3.49, the score of this variable falls in agree level hence; this variable could be a factor for the performance of transportation choice in pave logistics service.

Table 9 Does Nature of Commodity matter in the choice of transportation in pave logistic company?

Descriptive Statistics			
	N	Mean	Std. Deviation
Long lead times affect the nature of commodity	153	3.84	.721
Poor warehouse layout affects the nature of commodity	153	2.86	1.091
Irregular deliveries affect the nature of commodity	153	3.72	.739
Improper forecasting effect of demand in nature of commodity	153	3.44	.909
Nature of Commodity	153	3.4624	

Source:
Own survey source (2022)
Table 9

shows how the nature of the commodity influences the mode of transportation chosen by the paving logistic business. As a result, the majority of the respondents agreed with those items. The first item that received a higher mean score from the respondents was the question supposed that long lead times which accounts for 3.84, and irregular deliveries affect the nature of commodity which is the mean score of 3.72, improper forecasting of demand which accounts 3.44, and poor warehouse layout which is the mean score of 2.86 in addition, the average mean for nature of commodity had a means a score of 3.46. Accordingly, the analysis shows that the nature of commodity had a means score of 3.46, the score of this variable falls in agree level hence; this variable can be a factor for the performance of transportation choice in pave logistics service.

Table 10 Does regularity influence the choice of transportation in pave logistic company?

Descriptive Statistics				Source: Own survey source (2022)
	N	Mean	Std. Deviation	
Customer service influences the regularity of the company service	153	3.33	.810	
There is good transportation cost control	153	3.84	.650	
There is well-organized planning & risk management	153	3.30	.804	
There are good supplier/partner relationships	153	3.74	1.117	
There is no difficulty with government and environmental regulations	153	3.34	.779	
Regularity	153	3.5098		

Table 10. In the paving logistic service, how regularity does affects the mode of transportation used. As a result, the majority of respondents agreed with those items. The first item for which respondents provided a higher mean score was the question assuming that the question supposed that there is good transportation cost control which accounts for 3.84, There are good supplier/partner relationships which accounts for 3.74, and there is no difficulty with government and environmental regulations which accounts 3.34, customer service does influence the regularity of the company service which is the mean score of 3.33, and there is well-organized planning & risk management which is the mean score of 3.30 also, the average mean for regularity had a means a score of 3.50. Therefore, the analysis shows that regularity had a means score of 3.50, the score of this variable falls in agree level therefore; this variable can be a factor for the performance of transportation choice in pave logistics service.

Table 11 Do Safety and security disturb the choice of transportation in pave logistic service?

Descriptive Statistics			
	N	Mean	Std. Deviation
There is safe packaging of cargo in containers	153	3.54	.980
Good Prevention of tampering with the cargo container	153	3.41	.949
Safely transporting the container to its final destination	153	3.82	.736
Follow Best Practices of Cargo Shipping Containment	153	2.86	1.101
Fill Shipping Containers to Near Capacity	153	3.71	.740
Take a Final Pre-Loading Inventory	153	3.44	.909
Secure More Comprehensive Cargo Insurance	153	3.82	.736
Safety and security	153	3.5154	

Source: Own survey source (2022)

Table 11 shows that the choice of transportation in logistic service is influenced by safety and security. As a result, the majority of responders seemed to agree with those questions. The first question in which the respondents gave a higher mean score was the question supposed that secure more comprehensive cargo insurance and safely transporting the container to its final destination which are the mean scores of 3.82 each, fill shipping containers to near capacity which accounts for 3.71, there is safe packaging of cargo in containers which is the mean score of 3.54, take a final pre-loading inventory which accounts 3.44, good prevention of tampering of the cargo container which is the mean score of 3.41, and follow best practices of cargo shipping containment which is the mean score of 2.86, and the average mean for safety and security had a means a score of 3.51. Therefore, the analysis shows that safety and security had a means a score of 3.51, the score of this variable falls in agree level hence; this variable can be a factor for the performance of transportation choice in pave logistics service.

Table 12 Does the transport management system affect the choice of transportation in paving logistic service?

Descriptive Statistics			
	N	Mean	Std. Deviation
The company has a well-organized transport supervision method	153	2.97	1.076
The company has a well-organized drivers mission assignment system	153	3.8497	.95125
The company has assigned a responsible officer for handling the assignment	153	4.1111	.79103
There is a habit to motivate/rewarding an exemplary employee	153	3.8497	.77605
The company has a successful performance evaluation system for employees	153	3.7526	.72802
There is an employee development and learning program in the company	153	3.5098	1.02673
Employees are responsible for the safe, neat, and lawful operation of the assigned task	153	3.5621	.81781
Workers always fill & properly maintain the vehicle logbook for all the distance traveled	153	3.3856	.68943
The company has an automated transportation system	153	3.6667	.67862
The company has a well-coordinated fleet management system	153	2.9216	.92145
The company facilitates a customer-oriented transportation system	153	3.7563	.79704
The company has a good vehicle maintenance policy	153	3.2197	.97538
Transport Management system	153	3.5833	

Source: Own survey source (2022)

Table 12 reveals that the paving logistic service's transportation option is influenced by the transport management system. As a result, the majority of responders seemed to agree with those questions. The first question, which received a higher mean score from the respondents, was the question assuming that, the company has assigned a responsible officer for handling

assignment which is the mean score of 4.11, the company has well-organized drivers mission assignment system and there is a habit to motivate/reward an exemplary employee which are the mean score of 3.84 each, the company has successful performance evaluation system for employees and the company facilitate customer oriented transportation system which are the mean score of 3.75 each, the company has automated transportation system which accounts 3.66, employees are responsible for the safe, neat and lawful operation of the assigned task which is the mean score of 3.56, there is employee development and learning program in the company which accounts 3.50, workers always fill & properly maintain vehicle log book for all the distance travelled which is the mean score of 3.38, the company has good vehicle maintenance policy which is the mean score of 3.21, the company has well-coordinated fleet management system which accounts 2.92, and the company has well organized transport supervision method which accounts 2.97 and the average mean score for transport management system had a mean score of 3.58. Therefore, the analysis shows that the transport management system had a mean score of 3.58, the score of this variable falls in agree level hence; this variable is a factor for the performance of transportation choice in pave logistics service.

Table 13 .Performance of pave logistic service

Descriptive Statistics			
	N	Mean	Std. Deviation
Able to concentrate on the company's core business	153	3.5286	.81154
Reduced operating costs	153	4.0850	.78596
Able to access the latest technologies	153	4.0719	.77887
The quality of work provided by the provider is higher than anticipated	153	4.0261	.73402
There is a good communication system	153	3.9085	.74657
There is the reparation of control over key information of the company	153	3.9985	.93443
There is a conflict of interest b/n the company employees	153	3.2745	.83694
The capacity of the employee is high in accommodating the demands of the company	153	3.2810	.83868
Performance	153	3.7679	

Source: Own survey source (2022)

Table 13 demonstrates the pave logistic service's performance. As a result, the majority of respondents agreed with those points. The first question assumed that had a higher mean score from the respondents. the company reduced operating costs which account for 4.08, and the company can access the latest technologies which is the mean score of 4.07, quality of work provided by the provider is lower than the anticipated 4.02, and there is a loss of control over key information of the company which accounts 3.99, there is communication difficulty in the company 3.90, the company able to concentrate on the company core business which is the mean score of 3.52, the capacity of the employee is low in accommodating the demands of the company which is the mean score of 3.28, and there is a conflict of interest between the company employees which accounts 3.27 besides, the average mean score for performance had a mean score of 3.76 and the score of this variable falls in agree level. Therefore, the analysis shows that pave logistic service is perform well in logistic service.

4.3 Correlation Analyses

Aside from descriptive analysis, correlation analysis is performed to check if each variable has a relationship. All variables had a substantial relationship with performance, according to the analysis. As a result, all variables exhibited a significant ($p = .000$) and positive link with performance.

Table 14 Correlation analysis

Correlations								
		CS	S	F	NC	R	SS	P
CS	Pearson Correlation	1						
	Sig. (2-tailed)							
	N	153						
S	Pearson Correlation	.156	1					
	Sig. (2-tailed)	.054						
	N	153	153					
F	Pearson Correlation	.121	.986**	1				
	Sig. (2-tailed)	.137	.000					
	N	153	153	153				
NC	Pearson Correlation	.420**	.381**	.309**	1			
	Sig. (2-tailed)	.000	.000	.000				
	N	153	153	153	153			
R	Pearson Correlation	.323**	.416**	.402**	.303**	1		
	Sig. (2-tailed)	.000	.000	.000	.000			
	N	153	153	153	153	153		
SS	Pearson Correlation	.487**	.171*	.151	.246**	.450**	1	
	Sig. (2-tailed)	.000	.034	.062	.002	.000		
	N	153	153	153	153	153	153	
P	Pearson Correlation	.414**	.834**	.810**	.517**	.547**	.329**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	153	153	153	153	153	153	153
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Source: Own survey source (2022)

4.4. Regression Analysis

4.4.2. Regression Analysis Result

Table 15 Regression Analysis.

The regression model found is;

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.157	2.107		6.248	.000
	CS	.229	.163	.199	4.482	.000
	S	1.202	.594	.503	2.022	.045
	F	.539	.702	.186	.767	.444
	NC	.317	.334	.135	2.904	.004
	R	.340	.267	.150	3.392	.001
	SS	.013	.138	.017	.388	.699
a. Dependent Variable: P						

Source: Own survey source (2022)

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \beta_n X_n + e$$

$$Y = .229CS + 1.202S + .539F + .317NC + .340R + .013SS$$

From the above table 15, performance has a positive relationship with all variables, besides regarding the significant level, cost of service, Nature of commodity and regularity are statistically significant at the 5% significance level ($\beta = .229$; $p = .000 < .05$), ($\beta = .317$; $p = .004 < .05$), and ($\beta = .340$; $p = .001 < .05$) also performance has a positive relationship with speed, flexibility, and safety and security but insignificant relationship ($\beta = 1.202$; $p = .045 > .05$), ($\beta = .539$; $p = .444 > .05$) and ($\beta = .013$; $p = .699 > .05$).

It can be seen from the above that several of the coefficients are positive, indicating that a change in any of the independent factors has a similar effect on performance. Overall, the consistency of regression coefficients on the chosen area indicates that these variables are important indicators for influencing the performance of transportation choice at pave logistics service to varying degrees, and that some of the independent variables were significant predictors of problem occurrence.

4.4.3 Model Summary

Table 16 model summery

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.900 ^a	.809	.801	4.43818

Source: Own survey source (2022)

Table 16 shows the R Square corrected for value. The relevance of an independent variable, as well as the percentage of variation in error performance, has been explained. The value in this model was 0.801, indicating that the independent variables in the model explain 80.1 percent of the variance in the dependent variable. Other factors can potentially account for 19.9% of the difference, according to the model.

4.4.4 ANOVA

Table 17 ANOVA,

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12206.808	6	2034.468	103.286	.000 ^b
	Residual	2875.833	146	19.697		
	Total	15082.640	152			
a. Dependent Variable: P						
b. Predictors: (Constant), SS, F, NC, R, CS, S						

Source: Own survey source (2022)

The findings of the ANOVA Regression Analysis are shown in Table 17, if the independent factors are statistically significant for predicting the dependent variable, the p-value designated as "Sig." is calculated in the ANOVA table. Furthermore, if p is less than or equal to 0.05, the model is statistically significant; if p is greater than or equal to 0.05, the model is statistically

insignificant. As a result, as seen in the ANOVA table above, the regression model's mode is a good fit for the data. ($p=0.000$, or less than 0.05)

4.5 Discussion

The discussion seeks to finalize the objectives of the study and answer the research questions. The results are discussed in this section based on the data collected and the analysis carried out. Data collected using questionnaires were analyzed using descriptive, statistics frequency distribution, and inferential analysis. The discussion sought to achieve the objectives of the study and to answer the research questions that primarily assessed transportation choice and its impact on logistics performance in the case of pave logistics company in Addis Ababa Ethiopia.

Regarding identifying the influence of cost on the choice of transportation on Pave logistics company performance, the descriptive study found out that, a means a score of 3.79, and inferential statistic suggests that cost of service is statistically significant at the 5% significance level ($\beta = .229$; $p = .000 < .05$) hence, this variable becomes a reason for the performance of transportation choice in pave logistics service.

According to (Janic, 2007) costs for any transport mode influence the choice of transportation on company performance These are costs internal to the company involved in the shipping, hence the term 'internal costs'. As such, it is also solely the company that pays for these expenses or in turn its customers. If a fee is increased, so are the operating costs, which means higher prices for the customers or lower profitability for the company. Literature suggests that transportation networks must increase capacity while cutting transportation costs. All users (individuals, businesses, institutions, governments, and so on) must negotiate or bid for passenger and freight mobility since suppliers, distribution networks, tariffs, salaries, locations, marketing tactics, and fuel costs are constantly changing (N. Afraz and colleagues, 2006).

The next discussion focuses on how the nature of a commodity influence the choice of transportation and performance of the company from the finding nature of a commodity can be a factor in the choice of transportation and performance of the company, hence the descriptive result shows that nature of commodity had a means a score of 3.46., and the inferential statistic indicate that nature of commodity statistically significant at the 5% significance level, ($\beta = .317$;

$p = .004 < .05$), therefore this variable influence the performance of transportation choice in pave logistics service.

Also, according to Sabry, (2015), the nature of the commodity plays a key role in determining which method of transport is the best value. Similarly, type of good in terms of urgency of delivery, such as how unpreserved the goods are, and how quickly they need to arrive, influences the choice of mode of transport.

Concerning how regularity influences the choice of transportation and performance of the company indicated in the descriptive result regularity had a means a score of 3.50, the score of this variable can be a factor for the performance of transportation choice in pave logistics service. In addition, the result of the descriptive is strengthened by inferential statistics and the result indicates that regularity is statistically significant at the 5% significance level, ($\beta = .340$; $p = .001 < .05$). Therefore it's real that regularity influences the choice of transportation and performance of Pave logistics service.

Besides, literature shows that the reliability of the vehicle or mode must be consistent. All factors will turn out to be useless if the vehicle develops some fault or is prone to develop a fault. If the mode is not reliable then it will result in a loss of both time and money. Reliability again becomes important based on the situation (H Mohajan, 2017).

According to Brooks (2008), trade networks demand superior logistics services and centers that minimize financial and time costs while ensuring reliable delivery of goods. Transportation takes the largest share from logistic services and infrastructures such as highways and railways can reduce distribution margins of the transportation cost in narrowing the gap between prices faced by producers and consumers, thereby facilitating better improvements for both; in general efficient transportation infrastructures lower transaction costs, raise value-added and increase potential profitability.

CHAPTER FIVE

5. SUMMARY OF KEY FINDINGS, CONCLUSION AND RECOMMENDATION

The final part of this research paper provides summary, conclusions and recommendations drawn from the findings of the data collected by questioner.

5.1 SUMMARY OF KEY FINDINGS

Pave logistics and trading Plc. is a logistics company established and registered in Ethiopia in 2015. To establish the business in this industry, the company has gone through research to come up with the gap in the industry and has discovered that there needs to be done a lot of work to fill the gap especially in paving the way for clearing and forwarding which is the motor for any Economy in this world. Based on this fact, the company came up with highly sophisticated and customized service solutions, which filled the gap at its stake for those clients who tasted it so far. Pave Logistics serves the local market impeccably through Land transportation in Import/Export, Canvassing of Sea Freight, Airfreight sales, clearance and transportation to and from customers' premises, value-added services on consultancy on compliance, and many more.

This study intends to investigate this uncharted and overlooked area of logistics service. The research was expected to investigate the performance of transportation choice on logistics in the case of pave logistics company Addis Ababa through six main variables which includes; cost of service, speed, flexibility, regularity, safety & security, and nature of the commodity. In order to achieve these objectives, data were collected from the employees of the company and processed in quantitative of descriptive approach, correlation and regression analysis.

From the demographic characteristics of respondents, 92 (60%) male and 61(40%) female respondents were participated also, majority of male and female respondents were higher/advanced diploma holders. Furthermore, the large number of respondents who participated in the study was from operation management sections which are (73.2.9%). Also, the large number of respondents who participated in the study has worked from 6-to 10 years in the organization hence this indicate that, the work experience of the respondents had acceptable experience to the work area and had a potential of bringing change to the organization.

In order to respond to the research questions, the logit model was employed to answer the basic question. The study incorporates six independent variables in which all of them were measured on a 5-point Likert-Scale, with “5” stands for “Strongly Agree” and “1” stands for “Strongly Disagree”. Apparently, mean was used as a measure of central tendency. Besides, the data were encoded, processed and analysed using SPSS.V20

The analysis result shows that the mean score values for the company’s logistics performance has average mean value 3.76 which really indicates the operational performance of Pave logistic service is good. Moreover, the value of regression analysis shows that the results of the model estimation exposed that, most of the variables which cost of service, regularity, and nature of the commodity had significant effect on Pave logistics performance but the rest speed, flexibility and safety and security were not significant.

On the regression analysis it shows that the three independent variables have significant effect on Pave logistics performance (cost of service, regularity, and nature of the commodity) three independent variable (speed, flexibility and safety and security) has not significant effect on logistics performance of Pave Company. However, the overall effect of the three variables on the operational performance is 87 %.

5.2 CONCLUSION

The main consequences of logistics performance in this study were all six factors. Six research questions were established and addressed in this study, and they were all evaluated higher than the average mean value of 2.5. In other words, it demonstrates that on average, the majority of respondents believed that the organization's logistical performance should be improved.

Cost of service and logistical performance have a strong relationship. The mean score of this variable indicates that there was a problem in logistics activity and that the organization's operational performance was dependent on this variable, and the result shows that cost of service has a 22.9 percent effect on the logistics performance of the organization when all other variables are held constant.

In addition, because this variable has a substantial impact on logistics performance, the organization's logistics performance is dependent on it on a frequent basis. Changes in regularity have a 34% impact on logistics performance, according to the company.

Poor warehouse layout impacts the nature of the commodity, so the logistics performance of the organization is dependent on this element since it has a substantial impact on logistics performance.

5.3 RECOMMENDATIONS

The research recommends the following ideas as all-encompassing recommendations to the problem based on the study's findings. The analysis result shows that the mean score values for the company's logistics performance is 3.76 which is higher than the average 2,8 and really indicates the operational performance of Pave logistic service is good, However, In order to more improve the logistics service performance, the company should focus on

- the Cost of service has a 22.9 percent effect on the logistics performance of the organization when all other variables are held constant besides, the company should place more emphasis on operational costs than other factors because costs are what drive all of the company's daily operations
- Problems made by humans (human error), especially in controlling the vehicle's speed and give training with true evidence for vehicle drivers that may minimize the risk.
- Another issue (problem) rose by respondents was a lack of drivers; so, to address the issue, the organization should build procedures, such as providing incentives and prizes for high-performing drivers.
- The warehouses should be in a well-connected and conveniently accessible location. Poor warehouse architecture has an impact on the nature of the commodity and minimizes stock losses; as a result, the company has made significant improvements to its warehouse in order to improve its overall performance.
- It should use a well-organized transit supervision approach by increasing supervisory capacity by providing short-term assignments (training, and instruction, etc.)

Because a logistics company's fleet management system is so important, Pave Logistics Company should improve its fleet management system by employing various techniques, technologies, and fleet management software. As a result, the company's fleet management system will improve.

5.4 SUGGESTION OF FUTURE RESEARCH

Other variables can affect the company's logistics performance, therefore integrating them and conducting the research will yield a better outcome. This study is confined to only Pave Logistics Service PLC. in Addis Ababa, but it will provide a comprehensive picture of transportation options and their impact on logistics performance. This study is more quantitative, but it will serve as a foundation for qualitative research that can be decided by observation in order to collect non-numerical data. Furthermore, half of the independent variables are not significant, implying that more research is needed to identify other factors influencing logistics performance in logistics service providers.

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Appendix I
QUESTIONNAIRE
ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE GRADUATE STUDIES
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT
QUESTIONNAIRE TO BE FILLED BY RESPONDENTS

Dear respondents:

This questionnaire aims to gather data used for a thesis on the title of **factors affecting transportation choice in the case of Pave logistics service plc Addis Ababa**. For the partial fulfilment of the requirements for the Masters of Logistics and Supply Chain Management Degree. Your genuine answer is significantly respected and will contribute a lot to the accuracy of this study. The information collected from this questionnaire will merely be used for academic purposes and will be treated with strict confidentiality.

Thank you for your time and consideration

Instruction:

Please, put a tick (✓) mark in which you want to select

Don't write your name on the answering sheet

Part I: Questions related to Background Information

1. Gender

Male ☐

Female ☐

2. State your highest level of education?

MA/MSC ☐

BA/BSC ☐

Diploma ☐

Certificate ☐

3. Position in your organization

General Manager ☐ Finance Manager ☐ marketing manager ☐

Human Resource operation manager ☐ others ☐ ☐

4. How long have you been working in the organization (Pave logistics)?

Less than 5 years ☐ between 10 and 15 years ☐

Between 5 and 10 years ☐ Over 15 years ☐

5. Which mode of transportation risk is more frequent?

Road transport ☐ Railway transport ☐

Sea transport ☐ Air freight transport ☐

Part II: Questions related to mobility (transportation) options on logistics performance practice.

To be answered using a tick (✓) mark. The five Likert Scale points denote: 1=Strongly Disagree, 2=Disagree, 3=Neutral 4=Agree 5= Strongly Agree. The questions grouped into five topics are:

1. Does cost influence the choice of transportation in paving logistic companies?

No		1	2	3	4	5
	Cost of service					
1	Energy (fuel) costs influence the choice of transportation					
2	The labor market for commercial drivers affects the choice of transportation					
3	Demand for freight can influence the choice of transportation					
4	Customer loyalty influences the choice of transportation					
5	Means of transportation capacity affect the choice of transportation					
6	Government regulation on cost determination influences the choice of transportation					
7	Geopolitical events can affect the choice of transportation					

2. How does speed influence the choice of transportation in pave logistic company

No	Item	1	2	3	4	5
1	There is a breakdown of transportation					

2	There are shortages of drivers					
3	natural disasters limit the speed					
4	human errors affect speed					

3. Does flexibility affect the choice of transportation in pave logistic company?

No	Item	1	2	3	4	5
1	Visibility of products					
2	Political climate					
3	Whether condition					

4. Does Nature of Commodity matter the choice of transportation in pave logistic company?

No	Item	1	2	3	4	5
1	Long lead times affect the nature of commodity					
2	Poor warehouse layout affectsthe nature of commodity					
3	Irregular deliveries affect the nature of commodity					
4	Improper forecastingeffect of demand in nature of commodity					

5. How does regularity influence the choice of transportation in pave logistic company?

No	Item	1	2	3	4	5
1	Customer serviceinfluencethe regularity of the company service					
2	There is good transportation cost control					
3	There is well-organized planning & risk management					
4	There are good supplier/partner relationships					

5	There is no difficulty with government and environmental regulations					
---	--	--	--	--	--	--

6. Do Safety and security disturb the choice of transportation in pave logistic company?

No	Items	1	2	3	4	5
1	There is safe packaging of cargo in containers					
2	Good Prevention of tampering with the cargo container					
3	Safely transporting the container to its final destination					
4	Follow Best Practices of Cargo Shipping Containment					
5	Fill Shipping Containers to Near Capacity					
6	Take a Final Pre-Loading Inventory					
7	Secure More Comprehensive Cargo Insurance					

7. Which mode of transportation risk is more frequent from your company experience?

No	Item	More frequent	Sometimes	Less frequent
1	Road transportation			
2	Railway transportation			
3	sea transportation			
4	Air-freight transportation			

8. Transport Management system

No	Item	1	2	3	4	5
1	The company has a well-organized transport supervision method					
2	The company has a well-organized drivers mission assignment system					

3	The company has assigned a responsible officer for handling the assignment					
4	There is a habit to motivate/rewarding an exemplary employee					
5	The company has a successful performance evaluation system for employees					
6	There is an employee development and learning program in the company					
7	Employees are responsible for the safe, neat, and lawful operation of the assigned task					
8	Workers always fill & properly maintain the vehicle logbook for all the distance traveled					
9	The company has an automated transportation system					
10	The company has a well-coordinated fleet management system					
11	The company facilitates a customer-oriented transportation system					
12	The company has a good vehicle maintenance policy					

9. performance of the company

No	Items	1	2	3	4	5
1	Able to concentrate on the company's core business					
2	Reduced operating costs					
3	Able to access the latest technologies					
4	The quality of work provided by the provider is higher than anticipated					
5	There is a good communication system					
6	There is the reparation of control over key information of the company					
7	There is a conflict of interest b/n the company employees					
8	The capacity of the employee is high in accommodate the demands of the company					

THANK YOU

FOR YOUR VALUABLE INPUT, TIME, AND UNLIMITED COOPERATION

Appendix II

Preliminary Tests

However, before starting the regression analysis, a Heteroscedasticity and Multicollinearity test was undertaken. The heteroscedasticity assumption describes the variance of error components that are similar across independent variable values. Heteroscedasticity is demonstrated when the variance of errors differs at different values of the independent variable. Multicollinearity, on the other hand, refers to a situation in which the independent variables are highly interrelated in a way that has unfavorable implications for regression analysis results. Collinearity occurs when one of the variables is removed or a new variable is created that combines the previous two that were highly correlated. When predictor variables are strongly correlated, they share essentially the same information and, when combined, can explain a lot of variances (Robert, 2006).

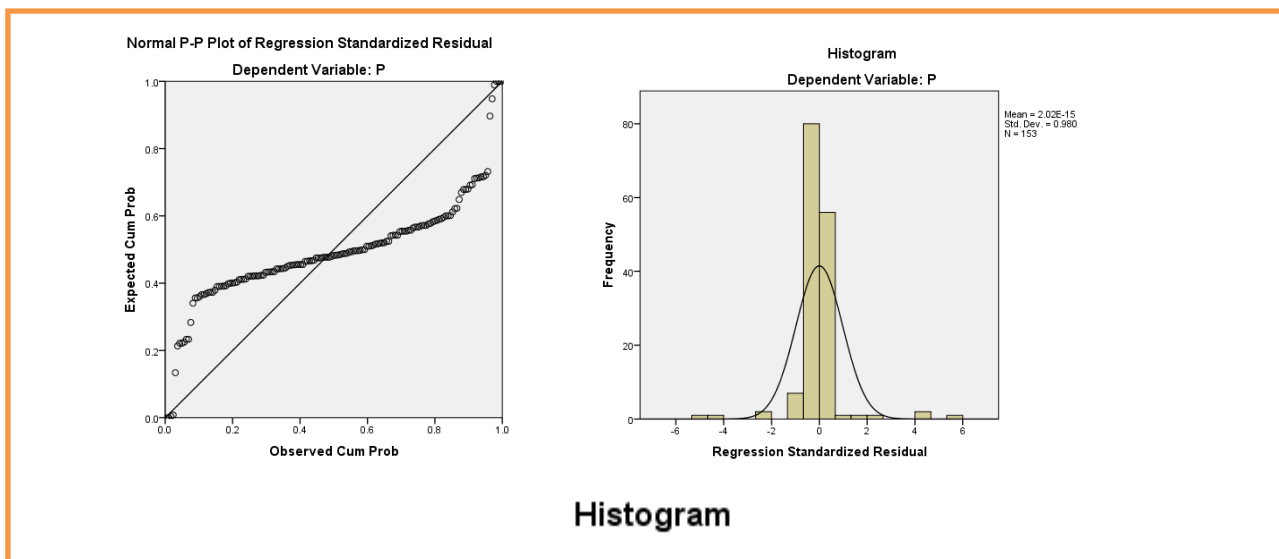
A. Multicollinearity Test

Collinearity Statistics	
Tolerance	VIF
.661	1.514
.568	7.380
.155	6.451
.606	1.650
.667	1.499
.666	1.501

According to the VIF test, the data does not have any multicollinearity issues. The maximum VIF value, according to the Table is 7.380. As a result, all variables are within permissible limits. On this basis, it may be inferred that there is no multicollinearity effect because all variables meeting the tolerance conditions should be more than 0.2 or have a VIF (variance inflation factor) of less than 10.

B. Normality test

The residuals from a linear regression model are one application of normality testing. If the residuals are not normally distributed, it is possible that the dependent variable or at least one explanatory variable has the incorrect functional form, or if essential variables are missing.



C. Autocorrelation Test

Despite the fact that residuals are normally distributed, there should be no serial correlation between them. A Breusch-Godfrey approach is one of the ways to assess this problem; as shown in the table below, the significant value is larger than 5%; so, if it is not significant, it suggests there is no serial correlation between residuals.

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square	F Change	df1	df2	Sig. F Chan	

					Change				ge	
1	.900 ^a	.809	.801	4.43818	.809	103.286	6	146	.000	2.693
a. Predictors: (Constant), SS, F, NC, R, CS, S										
b. Dependent Variable: P										