FACTORS AFFECTING SHIPMENT DELIVERY TIME: THE CASE OF UNOPS ETHIOPIA

By

KALKIDAN TAKELE

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, SCHOOL OF COMMERCE IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR AWARD OF MASTERS OF ART DEGREE IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

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Approved by the board of Examiners

Advisor	Signature	Date
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Internal Examiner	Signature	Date
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External Examiner	Signature	Date
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DECLARATION

I Kalkidan Takele hereby declare that this thesis represents my own work that has been done for the partial fulfilment of a Masters of Arts degree in Logistics and Supply Chain Management from Addis Ababa University School of Commerce and has not previously been included in a thesis or dissertation submitted to this or any other institution for a degree, diploma, or other qualification, and I have acknowledged all the data sources used in the thesis.

Kalkidan

Signature_____

Date _____

ID: GSD/0950/10

Certification

I certify that **Kalkidan Takele** has conducted this Thesis ***"Factors Affecting Shipment Delivery Time: The Case of UNOPS Ethiopia Office"*** under my supervision and advice. Hence, I certify that the research is her own original work and that it is eligible for submission for granting a Masters of Arts Degree in Logistics and Supply Chain Management from the Addis Ababa University

Advisor: Busha Temesgen (Ph.D)

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Date: _____

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Kalkidan Takele

Definition of Abbreviations

ERP: Enterprise resource planning

KPI: Key Performance Indicators

LPI: Logistics Performance Indicators

OTD: On Time Delivery

SOP: Standard Operating procedures

UNOPS: United Nations Office for Project Services

USAID: United States Agency for International Government

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Abstract

The main purpose of this study is to explore shipment delivery time of the UNOPS Ethiopia office and to identify factors that affect shipment delivery time. A comprehensive literature review provides a foundation for understanding the existing body of knowledge and identifying research gaps in this particular case. The study adopts a mixed-methods approach, combining quantitative data analysis and qualitative assessments to identify and examine delivery time and the factors influencing shipment delivery time. Explanatory research design was used to carry out the research. All employees of UNOPS Ethiopia office and selected employees of 32 logistics service providers were included in the study. The total population of the study was 1,226. From the total population all employees of UNOPS using census sampling technique and selected employees from logistics service providers were selected using purposive sampling technique. A sample size of 293 with confidence level of 95% , 5% margin of error and 50% population proportion was used. Data collected through questionnaires and from shipment monitoring tools were analyzed quantitatively using descriptive statistics and a logistic regression model. However, data collected through interviews were analyzed qualitatively to substantiate what has been analyzed quantitatively. The result of the study was that there is an overall delay in shipment delivery time for both air and sea shipments. The research findings highlight factors that impact shipment delivery time which are customs clearance process and logistics infrastructures. Statistical analysis reveals correlations and dependencies between these factors and their impact on delivery performance. Factors such as ease of arranging international shipments, logistics service providers' performance and traceability and trackability were found not to have a significant effect on shipment delivery time. Additionally, qualitative data analysis and interviews with Firsthand experts provided deeper insights into the complexities and nuances of these factors. The research also identified best practices for mitigating delays and improving delivery time. Finally based on the findings it was recommended that collaboration and coordination among stakeholders, such as Suppliers, freight forwarders, customs authorities, and partners, in streamlining the delivery process is very important. It was also recommended that improvement of customs clearance processes and procedures along with improvement of logistics infrastructure will enhance delivery performance.

Key Words: *Delivery time, logistics infrastructure, customs clearance*

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Chapter One

1. Introduction

This part of the study gives an overview of the background of the study, statement of the problem, research questions, and objectives of the study, significance of the study, scope of the study, organization of the study, definition of operational terms, and delimitation of the study.

1.1. Background of the Study

Several scholars stress the significance of supply chain performance (e.g. Beamon, 1999; Brewer and Speh, 2000). The main objective of managing supply chain performance is to enhance the operational efficiency, profitability, and competitive position of a firm and its supply chain partners (Min, 2015).

Logistics as part of supply chain management plans, implements, and regulates the efficient, effective forward and reverse flow and storage of goods, services, and associated information between the point of origin and the point of consumption to meet customers' demands (CSCMP, 2013). From the logistics perspective, the order-to-delivery (OTD) process is one of the most important procedures to handle (Mattsson, 2004). The order-to-delivery process is an entire flow from the time an order is placed with a supplier until it is finally delivered to customers. Once an order is placed with a supplier, delivering the order to the final customer promptly is very crucial (Forslund, Jonsson, & Matsson, 2009).

The World Bank created the Logistics Performance Index (LPI) as a benchmarking tool to evaluate the efficiency of logistics and trade facilitation in various countries. It assesses key aspects of logistics performance, including customs efficiency, infrastructure quality, timeliness of shipments, and logistics service quality. The LPI offers insightful information to businesses, researchers, and policy makers who are interested in supply chain management and global trade (World Bank, 2023).

The logistics performance index puts six aspects to measure a country's logistics performance. These aspects are related to customs, infrastructure, arrangement of competitively priced shipments, logistics service quality, ability to track and trace consignments, and timeliness (Arvis,et al.2018).

Many scholars have put forward the importance of on time delivery to be a vital element in the performance of the overall order to delivery process.

According to Keebler et al., (1999); and Forslund and Jonsson (2007), on-time delivery is ranked as the most important performance dimension of order to delivery time process. They emphasized that delivering the required products on time is the ultimate measure and the most important supply chain metric. The purpose of any supply chain according to the study is to deliver the customers the products they need and when they need them.

Different studies show that different factors affect the on-time delivery of shipments. As per the World Bank's report shipment delivery time depends on the nature of the product, planning and management, logistics services, and distance to customers and suppliers, but also on external factors such as supply chain disruptions related to political risks or weather conditions (Arvis, et al.2018).

Factors associated with operational issues, human factor issues, logistical capability, infrastructure issues, customs customs-related issues were found to affect the timeline delivery of packages in the courier and logistics business (Belesty, 2019).

Once goods are procured and leave the supplier's plant or warehouse monitoring of the transportation and delivery arrangements of shipments is very important so that goods arrive on time and in good condition. Particularly for international shipments this involves the shipment of goods from the supplier's warehouse, through the port of entry, clearance through customs, receipt, and inspection at the designated place of delivery (USAID Deliver Project, 2011).

The United Nations Office for Project Services (UNOPS) is a project-based and self-funded United Nations agency. Since its inception in 1994, UNOPS' mission has been to help people build better lives and help countries achieve peace and sustainable development. It supports the UN and its partners in providing peace and security, humanitarian and development solutions. UNOPS project services include infrastructure, project management, procurement, human resources, financial management and other management services. The range of partners has expanded beyond the organizations, funds and programs of the United Nations system to include international and regional financial institutions, intergovernmental institutions, donor and recipient governments and non-governmental organizations, as well as foundations and the private sector (UNOPS, 2023).

UNOPS Ethiopia provides a wide range of project management, procurement, and infrastructure services with a focus on health, agriculture, and business. The UNOPS office in Addis Ababa, Ethiopia, was established in January 2009. It has supported the Government of Ethiopia, United Nations agencies, and other development partners in the country. As part of its procurement service, UNOPS Ethiopia procures different items from different geographical areas and delivers them to its partners in all parts of the country. It is very crucial for UNOPS Ethiopia to deliver items procured on behalf of its partners timely in order to avoid delay in delivering its procurement projects and costs associated with delays. Therefore, it is very important to investigate average delivery time for UNOPS Ethiopia shipments and also to investigate factors that have an effect on on-time delivery of shipments and suggest appropriate solutions.

1.2 Statement of the Problem

In the discussion so far, an attempt has been made to give a background on how shipment delivery time is an important aspect in logistics performance. It has also been indicated that different factors can affect shipment delivery time.

On-Time Delivery (OTD) means that a company’s ability to fulfill the delivery obligation based on the agreed time known as the delivery date, and if it does not fulfill the assigned tasks on time, it will reduce efficiency considering that the OTD -Process could be achieved if all factors involved in the process are effective. Through an effective OTD process, a triadic relationship is

established and managed by a collaborative system between all actors in the supply chain, and therefore a successful relationship will result in a strengthening of trust and bond between them. In addition, such a relationship requires that all actors exchange information with each other (Kamali, 2019).

Victor (2017) states that factors such as customs clearance regulations and procedures, mode of shipment selection, logistics service providers' performance, and logistics information sharing activities affect the effectiveness of logistics management activities.

UNOPS Ethiopia has signed 176 agreements with different partners to procure different items since the year 2018. The agreements are structured in a form of a project whereby each procurement service agreement has a predefined scope, quality, budget and timeline. From the 176 number of procurement agreements signed only 37 number of agreements were delivered as per the predefined timeline which is only 21% of the total procurement projects signed with different partners (UNOPS ERP system).

The delay in shipment delivery time for UNOPS can also be manifested through the number of charges UNOPS Ethiopia has paid for warehouse storage, demurrages, and detentions. UNOPS Ethiopia has paid a total of 5.5 million dollars for warehouse, port storage, and demurrage charges since the year 2018 and this has had a huge impact in alleviating the total cost of the projects.

Different factors can contribute to this delay since the procurement process involves procuring different items from all over the world. According to a study conducted by Belesty (2019) related operational-related issues, human factor-related issues, logistical capability issues, and customs and related carrier-related factors affect on-time delivery performance.

According to Heinonen (2015), different factors such as incomplete or missing customer specifications, unclear process responsibilities, and supplier performance contribute to delivery time. Factors such as logistics information sharing service, selection of mode of transportation,

customs regulations and procedures, and the performance of logistics service providers were found to affect the logistics performance (Victor, 2017).

Therefore, this study is conducted to find out factors that affect shipment delivery time for UNOPS Ethiopia and to come up with suggested solutions to improve the delivery time and reduce the project's cost so that partners' satisfaction can be achieved and developmental goals can be met.

1.3 Objective of the Study

1.3.1 General Objective

The general objective of this study is to identify factors that affect shipment delivery time at UNOPS Ethiopia office.

1.3.2 Specific Objectives

The specific objectives of this study are:

a. to investigate the average delivery time it takes UNOPS Ethiopia to deliver shipments to partners
b. to assess the effect of customs clearance on shipment delivery time for UNOPS Ethiopia
c. to assess the effect of infrastructure on shipment delivery time for UNOPS Ethiopia
d. to assess the effect of ease of arranging international shipments on shipment delivery time for UNOPS Ethiopia
e. to assess the effect of logistics service providers' performance on shipment delivery time for UNOPS Ethiopia
f. to assess the effect of track ability and traceability of shipments on shipment delivery time for UNOPS Ethiopia

1.4 Research Questions

a. What is the average delivery time it takes for UNOPS Ethiopia to deliver shipments to partners?
b. What is the effect of customs clearance on shipment delivery time for UNOPS Ethiopia?
c. What is the effect of infrastructure on shipment delivery time for UNOPS Ethiopia?
d. What is the effect of ease of arranging international shipments on shipment delivery time for UNOPS Ethiopia?
e. What is the effect of logistics service providers' performance on shipment delivery time for UNOPS Ethiopia?
f. What is the effect of shipments' trackability and traceability on shipment delivery time for UNOPS Ethiopia?

1.5. Significance of the Study

Different scholars have conducted several studies related to logistics performance. However, the researcher is unaware of any research specific to factors affecting shipment delivery time. Instead, the research works conducted were mostly from the broader perspective of logistics performance. To the best knowledge of the researcher, there is no research conducted on the organization under study on logistics-related topics. Therefore, this study is expected to benefit the organization as a stepping stone in identifying factors that hinder the successful delivery of shipments that the organization procures for its developmental partners. It will also provide valuable insights for logistics practitioners and international humanitarian organizations to identify areas of improvement in their operations and implement targeted strategies to enhance delivery time performance. It also contributes to the academic literature by synthesizing existing knowledge and offering new empirical evidence on the factors affecting shipment delivery time. The findings contribute to both theory and practice, informing decision-making processes and facilitating the development of effective strategies to optimize shipment delivery time in a

rapidly evolving business environment. This study can also be used by other academicians and stakeholders who have an interest in conducting further studies in this area.

1.6. Scope of the Study

The study aims to focus on factors affecting shipment delivery time for shipments UNOPS Ethiopia procures on behalf of its different partners. UNOPS uses an international procurement scheme that allows firms around the world to bid on contracts for goods. Therefore, most of the time items are procured from abroad. This involves picking up items from the agreed point of delivery with the supplier, transportation of items from different origins, port clearance, customs clearance, warehousing, offloading and delivery of items at partners' warehouses. Therefore, the scope of this study was limited to studying factors that affect shipment delivery time from the date an order is placed to the supplier to the date procured items are delivered to the partner's warehouse.

The overall focus of this study is mainly on those employees of UNOPS who are directly involved in the project management, procurement and logistics, local customs clearing agents who have directly handled UNOPS Ethiopia shipments.

1.7 Delimitation of the Study

Different factors affect shipment delivery time. However, factors that affect delivery time before placing an order with the supplier were not considered in this study. Other factors that can affect the procurement project's closure period after shipments are delivered to the partner's warehouse such as inspection-related issues, installation, training, and financial closures-related issues were not considered in this study as well. Those factors were not considered since the researcher aims to study factors affecting delivery time once an order is placed with a supplier and until delivery is finalized with the partner.

1.8 Definition of Terms and Concepts

Shipment - is a particular kind of cargo that is sent to another country on a ship, train, airplane, or other vehicle (Collins COBUILD Advanced Learner's Dictionary., 2023).

On-Time Delivery (OTD) - Min (2015, p15) defines On-Time Delivery as a percentage of a match between the promised product delivery date and the actual product delivery date.

Logistics Performance Indicator (LPI) - A World Bank's unique benchmarking tool that is used to measure the logistics performance of countries (Arvis,et al.2018).

Logistics Service Providers - Logistics Service Provider means a company engaged in business of providing any one or more services, which include rail/road/sea/air transportation, air cargo, cargo consolidation, warehousing, Inland Container depot, cold chain services, port terminal services, Third Party logistics or Fourth party logistics (Law insider, 2023).

Logistics Infrastructure - infrastructure could be broadly defined as physical facilities, institutions and organizational structures, i.e., as the social and economic base for the operation of a society (Snieska & Simkunaite, 2009).

Customs - refers to a government agency responsible for regulating and controlling the movement of goods across international borders. Customs officials are responsible for ensuring that goods entering or leaving a country comply with all relevant laws and regulations, including those related to tariffs, taxes, and trade agreements (Langley et al., 2019).

1.9 Organization of the Study

This research thesis comprises five chapters that are organized sequentially as an introduction, review of related literature, research methodology, data analysis results, discussions, interpretations, and summary of main findings, conclusions, and recommendations.

Chapter 1 of this study serves as an introduction to the research. It gives some background of the study and the research problem, and it also lays out the research question, the importance, and the aim of the research. It also discusses the limitations and delimitations of the study to be conducted as well as the definition of operational terms that the researcher used for the study.

Chapter 2 of this study provides an in-depth review of related literature and the fundamental principles and factors that influence on-time delivery. Empirical studies in the subject matter are also briefly discussed in this part of the research.

Chapter 3 deals with the research methodology used in the study. Different statistical methods and techniques applied during the study are identified and discussed in detail.

Chapter 4 presents the data analysis results, discussion of the research findings and interpretation of the data.

Chapter 5 presents the summary of major findings, conclusions and recommendations based on the research conducted.

Chapter Two

2. Review of Related Literature

In this section of the study related literature addresses theoretical background, empirical studies and conceptual framework related to factors affecting shipment delivery time.

2.1. Theoretical Literature Review

2.1.1. Supply Chain Management

Supply chain and its management is a vast subject and has been defined differently by different scholars.

A supply chain is the group of parties engaged in the development of new goods and services, the acquisition of raw materials, the transformation of those resources into semi-finished and finished goods, and the delivery of those goods to the final consumers (Swaminathan, 2001).

Simchi-Levi et al (2003) defined supply chain management as a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and retail outlets so that goods are produced and distributed in the appropriate quantities, at the appropriate times, and in the proper locations in order to reduce system-wide costs and meet customer service level requirements.

Supply Chain Management (SCM) is the integration of crucial business processes from end users to original suppliers that deliver goods, services and information and add value for clients and other stakeholders (Cooper et al., 1997).

SCM includes all operations related to sourcing and procurement, conversion, and all logistics management activities. It is significant since it also entails coordination and cooperation with channel partners, which might include suppliers, intermediaries, third-party service providers,

and clients. Supply chain management essentially unifies supply and demand control inside and among organizations (CSCMP, 2013).

2.1.2. Logistics

The concept of logistics varies widely. But it can be summed up by saying that it's a way to have the correct product, in the appropriate amount and quality, at the right time and location. The distribution and transportation of products and services from the place of origin to the site of consumption, maintenance, procurement and warehousing, and distribution are the important components. The requirements of inbound, outbound, internal, and external movements as well as the return of materials for recycling and environmental considerations must be taken into account throughout the logistics design process (Adewole and Struthers, 2019).

Logistics is also defined as the management of the actual physical flow of goods from suppliers to customers. It includes transportation, warehousing, inventory control and information management (Chopra and Meindl, 2016)

Hesket, Glaskowsky, and Ivie (1973) defined logistics as “the management of all activities which facilitate movement and the coordination of supply and demand in creation of time and place utility”.

The Council of Supply Chain Management Professionals (CSCMP) in the United States defines logistics management as that part of supply chain management 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 in order to meet customers’ requirements (CSCMP, 2013).

Logistics management functions typically include inbound and outbound transportation management, warehousing, materials handling, order fulfillment, logistics network design,

inventory management, supply/demand planning, and administration of third-party logistics (3PL) service providers (Grant et. al, 2017).

2.1.3. Logistics Theories

Logistics is a crucial part of supply chain management, and it involves the planning, implementation, and control of the flow of goods, services, and information from the point of origin to the point of consumption. Logistics theories provide a framework for understanding the complex interactions and relationships that exist within logistics systems. The following are some of the most important logistics theories and their contributions to the field.

Resource-Based View Theory: This theory emphasizes the importance of logistics resources in creating competitive advantages for firms (Barney, 1991). The theory suggests that logistics resources such as transportation, warehousing, and inventory management can be sources of sustainable competitive advantage for firms that use them effectively.

Transaction Cost Theory: This theory suggests that logistics decisions are driven by transaction costs, which are the costs associated with exchanging goods and services (Williamson, 1975). The theory suggests that firms will choose the logistics option that minimizes transaction costs, such as outsourcing logistics activities to third-party logistics providers.

Systems Theory: This theory emphasizes the importance of viewing logistics as a system, rather than a collection of individual activities (Ackoff, 1971). The theory suggests that logistics decisions should be made with consideration of the entire logistics system, including suppliers, customers, and internal processes.

Contingency Theory: This theory suggests that there is no single best way to manage logistics systems and that the most effective approach depends on the specific context (Donaldson, 2001). The theory suggests that logistics managers must adapt their strategies to fit the unique characteristics of their organization and its environment.

Lean Theory: This theory emphasizes the importance of reducing waste and increasing efficiency in logistics systems (Womack et al., 1990). The theory suggests that logistics managers should focus on eliminating waste in all aspects of the logistics system, including transportation, warehousing, and inventory management.

These theories have all made important contributions to the field of logistics, providing insights into the factors that drive logistics decisions and the strategies that can be used to improve logistics performance. The transactional cost theory helps to choose the most economical delivery method by helping organizations to analyze the costs of several delivery options such as contracting, monitoring and enforcing agreements. Organizations can reduce the risk and uncertainties associated with shipment delivery by taking transactional cost into account, which will boost productivity and performance (Williamson, 1985). However, it is important to note that each theory has its strengths and limitations and that no single theory can fully capture the complexity of logistics systems.

2.1.4. Metrics to Measure Logistics Performance

The LPI of the World Bank, a multi-dimensional assessment of logistics performance, is an international benchmarking tool that focuses specifically on evaluating a country's trade and transport facilitation friendliness and assisting it in identifying the main obstacles to and opportunities for improvement. The six dimensions that the LPI uses to summarize each nation's performance in the logistics environment are as follows:

1. Customs: Efficiency of the customs clearance procedure.
2. Infrastructure; the standard of the infrastructure supporting trade and transportation.
3. International Shipments: ease of arranging shipments competitive in terms of price
4. Logistics Quality; competence and quality of Logistics Services.
5. Tracking and Tracing; ability to track and trace shipments
6. Timeliness; frequency with which shipments reach the consignee within the scheduled or expected time (Arvis et al., 2018).

2.1.5. Factors Affecting On-Time Delivery of Shipments

2.1.5.1 Customs

Customs is the name for the government body in charge of controlling how products enter and leave a nation. Additionally, it deals with the collection of import duty payments. The process of making sure that products match all customs standards and are permitted to enter or exit a country is known as customs clearance. This may entail submitting paperwork, paying taxes, and inspecting items (Duray, 2018).

The function of customs today extends beyond simply collecting import duties. The role now also addresses many important global concerns that have economic and societal implications. The three parts that make up the mission of the customs administration are all concerned with the international trade of goods: the fiscal (revenue collection, both directly and as support for the tax administration), the economic (implementation and oversight of specific government economic policies), and the protection and security (protection of citizens' health and protection of society from cross-border criminal activity) parts. Depending on the geographical, economic, and other characteristics of the country, the relative importance and priority of the roles and functions of customs may change, but the three essential components are consistently present (Azcárraga et.al, 2022).

Shipment delivery time might be significantly impacted by the customs clearance procedure, particularly for international shipments. It might be necessary for customs officers to inspect the items, which would cause a delay in delivery. The length of time needed for customs clearance can differ depending on the country, the type of goods and the amount of paperwork involved (Duyckinck & Duyckinck, 1855).

2.1.5.1.1 Customs & International Trade

International trade is an important factor in economic growth and development. It enhances standards of living in both developed and developing nations, helps end poverty, and makes the world a more stable, safe, and peaceful place. International trade is governed by regional and

multilateral trading systems, preferential trade agreements, and national governments (WCO, 2008).

Customs play an important role in international trade by ensuring that goods imported or exported from a country comply with the relevant customs regulations. This includes collecting duties and taxes, preventing the import or export of prohibited goods, and enforcing trade agreements (WCO, 2013).

2.1.5.1.2 Customs Clearance

Customs clearance ensures that goods imported or exported from a country comply with the relevant customs regulations. This entails declaring the products to customs, paying any applicable duties and taxes, and providing any required documentation (Yahuda, 2002).

According to the International Chamber of Commerce(ICC), the process of customs clearance varies from country to country but it typically involves the following steps:

- **Gather the necessary documents.** This includes the commercial invoice, bill of lading, packing list, certificate of origin, and any other documents required by the customs authority.
- **Complete the customs declaration form.** This form will ask for information about the goods, such as their value, quantity, and country of origin.
- **Pay any applicable duties and taxes.** The amount of duty and tax payable will depend on the type of goods, their value, and the country of origin.
- **Clear the goods through customs.** This may involve presenting the documents to a customs officer, paying the duties and taxes, and completing any other necessary formalities (ICC, 2022).

2.1.5.2 Logistics Infrastructure

Logistics infrastructure is the physical and organizational framework that enables the movement of goods and services. It includes a wide range of assets, such as roads, railways, airports, seaports, warehouses, and information technology systems (Hussein & Sheffi, 2010).

Logistics infrastructure plays a critical role in the global economy. It enables the efficient movement of goods and services, which in turn lowers costs and increases productivity. This has a positive impact on economic growth and development (World Bank, 2018).

A well-established logistics infrastructure can improve delivery time by providing a reliable and efficient transportation network, adequate storage facilities, information technology systems that can track the movement of goods and skilled workforces (Odeck, 2004).

Logistics infrastructure has different factors that are important for reducing shipment delivery time. Factors such as the quality of roads and railways, the efficiency of ports and airports, the availability of logistics services and the level of logistics automation to be used are considered to be important aspects of logistics infrastructure (Li, Wang & Zhang, 2020).

2.1.5.3 Ease of Arranging International Shipments

The efficiency and simplicity of the process of planning for the transportation of goods from one country to another is referred to as the ease of arranging international shipments. This indicator of logistics performance is measured based on how easy and efficient it is to get information on import and export regulations, the efficiency of customs procedures, the reliability and affordability of transport services, and how long it takes to transport goods internationally (World Bank, 2022).

The availability of information and communication technology (ICT) can also play a role in the ease of arranging international shipments. ICT can be used to improve the efficiency and transparency of customs procedures, to track shipments, and communicate with logistics service providers (Closs & Mollenkopf, 2018).

The ease of arranging international shipments is a critical factor in determining the competitiveness of a country's exports. A well-functioning logistics system can help to reduce the cost and time of shipping goods, which can make a country's exports more competitive.

2.1.5.4 Logistics Service Providers' Performance

Logistics service providers (LSPs) are companies that provide a variety of logistics services, such as transportation, warehousing, and freight forwarding. The performance of LSPs is critical to the success of their customers, as it can have a significant impact on the cost, speed, and reliability of delivery.

One of the most important factors that contribute to LSPs' performance is the quality of their assets. This includes the availability of vehicles, warehouses, and IT systems. LSPs with high-quality assets can provide more efficient and reliable services (Murphy and Poist, 2000).

Another important factor that contributes to LSPs' performance is the experience and expertise of their employees. LSPs with experienced and knowledgeable employees can provide better customer service and resolve problems more quickly. The effect of logistics service quality on customer satisfaction is positive (Closs and Stank, 1998).

The use of technology can also play a role in LSPs' performance. LSPs that use technology to track shipments, communicate with customers, and manage inventory can operate more efficiently and provide better customer service. The impact of logistics service providers on supply chain performance is positive (De Koster et al. 2007).

2.1.5.5 Trackability and Traceability of Shipments

Trackability and traceability of shipments are essential for the efficient and effective management of supply chains (Christopher & Holweg, 2011). By tracking the location and status of shipments, businesses can ensure that they are delivered on time and in the correct condition

(Fleischmann et al., 2005). Traceability can also be used to identify the source of any problems that may occur during the shipping process (Seuring & Goldbach, 2012).

One of the main benefits of track ability and traceability is that they can help to improve customer service (Christopher & Holweg, 2011). By providing customers with real-time information about the status of their shipments, businesses can build trust and loyalty.

Another benefit of track ability and traceability is that they can help to reduce costs (Fleischmann et al., 2005). By identifying and resolving problems early, businesses can avoid costly delays and damages.

However, there are also some challenges associated with track ability and traceability. One challenge is the cost of implementing these practices (Fleischmann et al., 2005). The technology required to track and trace shipments can be expensive.

Another challenge is the complexity of the supply chain (Seuring & Goldbach, 2012). In many cases, shipments must travel through multiple countries and jurisdictions. This can make it difficult to track and trace shipments accurately.

Despite the challenges, the benefits of track ability and traceability outweigh the costs. Businesses that implement these practices can improve customer service, reduce costs, and improve the efficiency of their supply chains (Christopher & Holweg, 2011).

2.1.5.6. Shipment On-Time Delivery

On-time delivery is one of the most prominent Order-to-Delivery performance measurements, also known as delivery precision (Forslund, Johnsson & Matsson, 2009). On-time delivery determines if a perfect delivery has been accomplished or not. The measurement is a driver for customer satisfaction and supply chain excellence (Gunasekaran, Patel, & Tirtiroglu, 2001).

Supplier's performance is monitored through its dependability. One of the dependability matrices being on time delivery, which is the percentage of orders delivered on time (Harrison and Hoek, 2008).

On time Delivery may be described as consisting of four sub-processes: the ordering by the customer, the delivery by the supplier, the transportation by the logistics service provider, and the sub-process for the customer's receipt of the products (Mattsson, 2004).

Adherence to deadlines means that the delivery takes place at the agreed time and that the quantity ordered corresponds to the quantity delivered (Kallio et al, 2000 cited in Forslund et al., 2008, Forslund & Jonsson, 2007.) It is the most important metric to measure the efficiency of the supply chain process in an organization. It is an indicator of an organization's ability to meet customer demand in terms of desired delivery date.

Metrics to Measure On-Time Delivery

On-time Delivery (OTD) can be measured as the percentage of shipments that are delivered on time, according to the agreed-upon delivery schedule (Mentzer et al, 2001).

$$\text{On-time delivery rate (\%)} = \left(\frac{\text{Number of on-time deliveries}}{\text{Total number of deliveries}}\right) * 100$$

Whereby:

Number of on-time deliveries: This is the number of shipments that were delivered on or before the agreed-upon delivery date.

Total number of deliveries: This is the total number of shipments that were made during the period in question.

On-time delivery rate (%): This is the percentage of shipments that were delivered on time.

Any time period, such as a day, week, month, or year, can be used to calculate the on-time delivery rate. It can also be computed for particular kinds of shipments, such express deliveries or delivery abroad.

Organizations should monitor the on-time delivery rate since it may be used to gauge how effectively their logistics operations are working. A company that consistently meets its delivery commitments will have a high on-time delivery rate, which can boost customer satisfaction and loyalty (Holcomb, Ginter & Nix 2010).

There are different variables that are commonly used to measure the performance of on-time delivery. Some of these variables are percentage of orders delivered on time, average lead time, number of late deliveries, customer satisfaction with delivery performance, and cost of late deliveries. Depending on the industry and the organization, different particular variables will be utilized to assess on-time delivery performance (Bringg, 2023).

2.2. Empirical Literature Review

The majority of key global supply chain challenges are time-related, and it looks like they are becoming even more time-related than ever before. The difference in timing, if all else is equal, might make or destroy a supply chain. Cost and core competencies are all primarily assessed against time from the internal supply chain's point of view (Lu, 2011).

2.2.1. Factors Affecting Shipment Delivery Time

Different scholars have identified various kinds of factors that affect the on-time delivery of shipments. Factors such as infrastructure, customs clearance, and quality of logistics service providers are some of the factors that are considered to affect a country’s logistics performance as per the World Bank’s LPI measurement (Arvis et. al, 2018).

2.2.1.1. Customs Clearance Vs Delivery Time

In logistics, customs play a critical role in facilitating the movement of goods across borders. Freight forwarders, customs brokers, and other logistics providers work closely with customs officials to ensure that goods are properly documented, declared, and cleared for entry or exit. Failure to comply with customs regulations can result in delays, fines, and other penalties that can disrupt supply chains and impact business operations (Wisner, Tan, & Leong, 2019).

Ojala L. & Celeb D. (2015) noted that the effectiveness of processes in the clearance and delivery of shipments and the transparency of customs clearance procedures are the primary factors determining performance differences across nations.

The result of a study conducted on the effect of customs clearance on shipment delivery time by Al-Haddad, Chuman, & Kouki (2021) suggested that customs clearance had a significant impact on shipment delivery time. The study found that in addition to customs clearance time factors such as type of goods, the value of the goods, and the port of origin also affect the shipment delivery time.

According to a study conducted by Endashaw (2020) regarding the customs clearance process on logistics efficiency for the Modjo customs branch office, he identified that there is a delay in customs clearance for import shipments. According to him the delay in customs clearance was caused due to redundancy of goods physical inspection and document checking, lack of adequate information about valuation and tariff classification by escalating lead time of goods after arriving at customs. He also indicated that this delay in customs clearance has an impact on import goods logistics efficiency.

A study conducted by Wondwosen (2020) stated that issues related to the overall customs clearance procedures, lack of clarity of customs proclamation, and lack of skilled customs officers affect the performance of the whole supply chain by delaying imported shipments at customs.

2.2.1.2. Logistics Infrastructure vs Delivery Time

Logistics Infrastructure comprises infrastructures such as roads, railways, airports, sea ports, ICT, and energy production. The logistics system includes warehouses, dry ports, and freight depots. By bringing together producers and customers, the market structure improves the efficiency of the freight transport and logistics system (Srivastava, 2006).

In a study conducted by Fekadu, 2013 on logistics practices in Ethiopia, low level in the development of logistics infrastructure such as adequate fleets of freight vehicles and lack of sea ports are some of the factors contributing to Ethiopia's poor logistics management system.

Bai et al., 2004; and Blyde and Molina, 2015 stated in their study that effective network design is vital for domestic and international logistics to timely deliver goods to customers. To do this, strategic infrastructure development establishes long-term plans to enhance the intermodal transportation system's capacity, including integration between maritime, land, and air transportation for overall economic growth and societal development.

According to Li, Wang, & Zhang (2020) generally, logistics infrastructure has an impact on shipment delivery time. However, the impact of logistics infrastructure on shipment delivery time can vary depending on the specific characteristics like the nature of the goods, the distance from which the shipment is shipped, and the mode of transportation used.

2.2.1.3. Ease of Arranging International Shipments vs Delivery Time

Several studies have examined the relationship between the ease of arranging international shipments and delivery time. A study by Liu et al. (2019) found that the ease of arranging international shipments positively influenced delivery time. The study suggested that businesses that arrange international shipments easily have greater control over their logistics process, which enables them to reduce the delivery time.

Similarly, a study by Chen et al. (2020) found that the ease of arranging international shipments was positively related to delivery time and that businesses that were able to arrange international shipments easily were able to deliver goods more quickly than those that faced difficulties in arranging shipments. The study suggested that businesses that invest in streamlining their logistics process can reduce their delivery time and gain a competitive advantage.

However, not all studies have found a positive relationship between the ease of arranging international shipments and delivery time. For example, a study by Hsu et al. (2018) found that the ease of arranging international shipments had no significant effect on delivery time. The study suggested that other factors such as transportation mode, customs clearance, and weather conditions could have a greater impact on delivery time than the ease of arranging international shipments.

Moreover, a study by Lee et al. (2020) found that the ease of arranging international shipments had a positive effect on delivery time, but the effect was moderated by the level of service quality provided by the logistics provider. The study suggested that businesses should consider both the ease of arranging international shipments and the level of service quality provided by the logistics provider when selecting a shipping method.

2.2.1.4. Logistics Service Providers' Performance vs Delivery Time

International trade is expanding extremely quickly and to stay competitive in the market, there is a constant need for effective and efficient international freight logistics services.

Logistics Service Providers (LSP) are any business entities that provide logistics services. LSP includes those service providers typically referred to as 3PL, 4PL, LLP, etc. These services include provisioning, transportation, warehousing, packaging, etc (CSCMP, 2013).

According to Wang & Chen (2019), logistics service providers' performance had a positive impact on delivery time. Logistics service providers that had higher performance demonstrated shorter delivery time than those who did not.

Studies conducted by Kumar &Shankar (2020); Siddiqui & Akram (2021); and Arun &Shankar (2022) further confirm that there is a positive relationship between the performance of logistics service providers and delivery time. In addition the researchers concluded that although LSP's performance plays an important role in the delivery time, factors such as distance between the origin and destination, mode of transportation, and the level of congestion in the transportation network.

In a study conducted by Essete (2019) poor efficiency of customs clearing agents' performance delayed delivery of shipments. The poor performance of customs clearing agents, however, were due to challenges in the customs automation system, human resource, risk management and harmonized system.

2.2.1.5 Trackability and Traceability of Shipments vs Delivery Time

Trackability and traceability of shipments refer to the ability to identify and monitor shipments as they move through the supply chain. This can be achieved through the use of various technologies such as RFID, GPS, and barcode scanning. The benefits of trackability and traceability of shipments include increased visibility, reduced lead times, and improved supply chain efficiency.

According to Handfield et al. (2013), trackability and traceability of shipments can help companies to monitor inventory levels and identify and resolve any issues that may arise. They argue that companies that track and trace their shipments have a competitive advantage as they are better able to manage their supply chains and respond to customer demand.

A study conducted by Lee and Nam (2016) showed that traceability has a positive impact on delivery time, with organizations that adopted traceability and traceability mechanisms having shorter delivery times than those that did not. The study also revealed that the impact of traceability was greater for organizations that had a more complex supply chain.

Delivery time is a critical factor for supply chain performance as it directly affects customer satisfaction and loyalty. According to Oya and Sakai (2014), delivery time is an important metric for measuring supply chain performance as it reflects the ability of companies to meet customer demand. They argue that companies that are able to deliver products quickly and reliably are more likely to retain customers and gain a competitive advantage.

In regards to the relationship between Trackability and Traceability of Shipments and Delivery Time, several studies have explored the relationship between trackability and traceability of shipments and delivery time. For example, Kuo and Yang (2012) found that companies that were able to track and trace their shipments had shorter lead times and were better able to meet customer demand. Similarly, Ferrell et al. (2010) found that companies that had implemented RFID technology for tracking and tracing their shipments had improved delivery times and reduced errors.

On the other hand, Kelleher and Kelliher (2005) found that delivery time was not significantly affected by the implementation of RFID technology for tracking and tracing shipments. They argue that other factors such as transportation time and customs clearance times may have a greater impact on delivery time.

2.3. Conceptual Framework

Based on the overall review of related literature and the World Bank's Logistics Performance Indicators the following conceptual framework is developed. In the framework, both the independent variables and the dependent variable used in this study are depicted and presented as follows. The variables are assumed to enable the researcher to determine if the independent variables which are logistics service providers' performance, customs clearance, and logistics infrastructure are some of the factors that affect the dependent variable which is shipment delivery time.

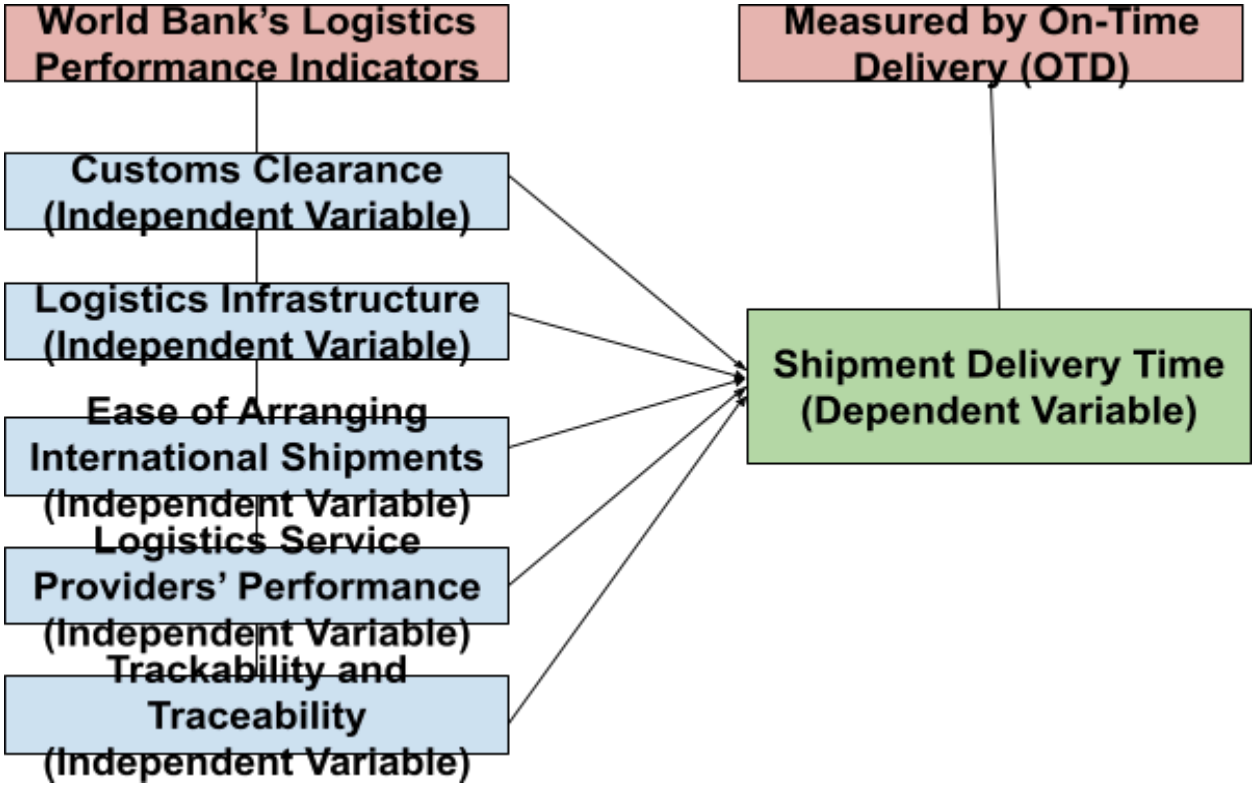

Figure 2.1: Conceptual Framework for Factors that Affect Shipment Delivery Time

Source: Own source developed based on World Bank's Logistics Performance Indicators (Arvis et al., 2018)

Chapter Three

3. Research Methodology

3.1. Description of the Study Area

This study was conducted in the United Nations Office for Project Services Ethiopia Office located in Addis Ababa Ethiopia around Kazanchis Area, inside the UNECA compound.

3.2. Research Approach

There are three types of research approaches namely Qualitative, Quantitative, and Mixed approach. According to Newman and Benz, qualitative and quantitative research approaches should not be viewed as rigid or distinct categories. Instead, they represent different ends on a continuum. Research tends to be more qualitative than quantitative and vice versa. The mixed methods approach resides in the middle of this continuum because it incorporates elements of both qualitative and quantitative approaches (Newman and Benz, 1998: 12).

Quantitative research relies primarily on the collection of quantitative data whereas the qualitative research approach relies on qualitative data. The mixed research approach, on the other hand, involves the mixing of quantitative and qualitative methods. Quantitative research is considered to be of primary importance to state one's hypotheses and then test those hypotheses with empirical data to see if they are supported. The qualitative research approach, however, is used when little is known about a topic or phenomenon and when one wants to discover or learn more about it. It is commonly used to understand people's experiences and to express their perspectives (Johnson and Christensen, 2014).

The researcher used a mixed research approach method to conduct the study since a mixed approach is useful to capture the best of both qualitative and quantitative research approaches. In this study the researcher intends to assess in detail the factors that are expected to affect shipment delivery time. Using the mixed approach helped the researcher to triangulate and support the data that was collected using a questionnaire.

3.3. Research Design

There are three different types of research design. These are descriptive, exploratory, and explanatory. Descriptive research design emphasizes identifying the frequency with which an event occurs. The exploratory type emphasizes the discovery of new ideas and insights and the explanatory research design involves establishing cause and effect and explains why something happens (Cooper and Schindler, 2000).

In order to enable the examination of both quantitative and qualitative data as well as inferential statistics, the researcher used both descriptive and explanatory research designs. The explanatory research design is used to find the relationships between the dependent variable (shipment delivery time) and the independent variables (customs clearance, logistics infrastructure, ease of arranging international shipments, logistics service providers' performance, shipment's trackability and traceability). A descriptive research design was used to allow the researcher to find out the average shipment delivery time for UNOPS Ethiopia shipments and to describe the basic features of the data in the study. Therefore, both explanatory and descriptive research designs are applied by the researcher to identify factors that affect the shipment delivery time of the UNOPS Ethiopia office.

3.4. Population and Sample Design

3.4.1 Population of the Study

The population of the study is an entire group of individuals or entities a study is intended to represent. It is the set of all possible subjects that could be included in a study (Neuman, 2014). The population of this study is all employees of the UNOPS Ethiopia office, all employees of the 32 logistics service providers who have handled UNOPS Ethiopia's shipment in the past five years (one UNOPS Projects ERP).

There are 55 personnel of UNOPS working at the UNOPS Ethiopia office. The total number of employees of logistics service providers who have handled UNOPS Ethiopia shipments in the past five years is 1171. Therefore, the total population for this study is 1,226.

3.4.2. Sampling Design

Sampling is the method of choosing a portion of a population to represent the entire population. Sampling is done to gather information that can be utilized to conclude the population (Brewer, 2000). In this study, different sampling techniques were used to take samples from the different types of target populations. The census method of sampling was used to select the number of participants from UNOPS personnel. However, a purposive sampling method was used for taking samples from logistics service providers who handled UNOPS Ethiopia's shipments in the past five years. A sample is considered representative of the population if the sample size is computed using a 95% confidence level and 5% margin of error (Cochran, W.G., 1997). Accordingly, a sample size of 293 was taken taking into consideration a 95% confidence level, 5% margin of error, and 50% population proportion.

3.5. Data Source and Type

This study used both primary and secondary types of data. Primary data was collected through questionnaires using closed-ended questions and semi-structured interviews conducted. Secondary data was used from different articles, books, oneUNOPS Projects ERP system, and websites.

3.6 Data Collection Procedures

The researcher collected data using close-ended questionnaires. The researcher adapted and modified questionnaires used by other studies and researchers on the subject area. The questionnaire was prepared using the English language since the respondents have adequate understanding of the English language. The questionnaire was pilot tested with 30 respondents. From the respondents' response, the researcher learnt that the questions listed under the On-Time delivery section were not appropriate to measure the on-Time delivery performance of the organization under study. Accordingly the necessary amendments were made and questionnaires were distributed to the sample respondents. Semi - Structured interview guidelines were developed by the researcher and seven personnel of UNOPS were interviewed. Participants of the interview were selected based on their role and expertise on the area under study.

Accordingly, one portfolio senior manager, two procurement specialists, one project Management Support Specialist, three logistics officers were included in the interview. The interview was conducted by the researcher but transcription was done with the assistance of another person. This allowed the researcher to focus on the respondents and enhanced the active-listening process. Secondary data was collected from the organization's ERP system as well as from UNOPS shipment monitoring tool.

3.7. Method of Data Analysis and Presentation

Data collected through the questionnaire was analyzed quantitatively using descriptive statistics and a logistic regression model. Descriptive statistics was used to compute the average order to delivery time for UNOPS Ethiopia shipments and to describe the basic features of the data in the study. Inferential statistics such as correlation and regression analysis were used to assess the possible association between the dependent and independent variables. In this case we have one dependent variable (Delivery time) and five independent variables (customs clearance, logistics infrastructure, ease of arranging international shipments, logistics service providers' performance, shipment trackability and traceability). The researcher used SPSS version 27 to analyze the data using descriptive and inferential statistics.

However, data which were gathered from interviews were analyzed qualitatively to support what was analyzed quantitatively.

3.8 Validity and Reliability Test

3.8.1. Validity

Validity refers to the extent to which a research instrument measures what it is supposed to measure (Kothari, 2004). In order for the researcher to check if the data collection instrument was clear for the respondents, possible efforts were exerted to make the instrument as easy and understandable. The data collection instrument was pilot tested with 30 selected respondents to

validate the instrument. This helped the researcher to make adjustments on some of the questions developed to measure on-time delivery.

3.8.2. Reliability

Reliability in research refers to the consistency of a measurement throughout various trials. In other words, a reliable measurement is one that yields consistent results among individuals and throughout time (Nunnally & Bernstein, 1994). Hosmer-Lemeshow test can be used to check reliability while using a logistic regression model. This test is a goodness-of-fit test that compares the observed and predicted probabilities of the dependent variable. A high p-value from the Hosmer-Lemeshow test indicates that the model is a good fit to the data (Hosmer et.al, 2013).

Where:

p-value	Interpretation
< 0.05	The model does not fit the data well.
0.05 to 0.10	The model may or may not fit the data well.
> 0.10	The model fits the data well.

Therefore the researcher used Hosmer and Lemeshow Test to check the reliability of the data collection instrument and the result is depicted as follows:

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	7.178	8	.518

Since the p value is greater than 0.10 the model fits the data well.

3.9. Ethical Considerations

Questionnaires were distributed to personnel of UNOPS Ethiopia and different logistics service providers. The respondents were assured that the information to be provided by them will be confidential and will only be used exclusively for academic purposes. The respondents were also

requested not to provide any identity detail and personal reference in the questionnaire distributed. The researcher also kept the information provided by respondents through semi-structured interviews confidential.

The researcher cited thoroughly all references cited in the research from different research studies, articles, text books, journals etc.

Chapter Four

4. Results, Discussion and Interpretation

4.1. Response Rate

The researcher targeted Factors Affecting Shipment Delivery Time: The Case of UNOPS Ethiopia Office. Questionnaires were distributed to 293 respondents in different managerial, team leader, technical, and junior positions; in addition, five (5) interviews were conducted.

From the 293 questionnaires distributed to respondents, 223 were filled and returned which makes the response rate 76.12%. No questionnaires were discarded because of incompleteness. According to Lindeman (2019), the acceptable questionnaire response rate in research depends on a number of factors, including the type of questionnaire, the population being surveyed, and the purpose of the study. However, a general rule of thumb is that a response rate of 50% or higher is considered to be acceptable. This makes the response rate of 76.12% for the study very good for further analysis and generalization.

4.2. Respondents Profile

In table 4.1 below, we can see the different demographic characteristics of the respondents. Out of the given respondents 6 (2.7%) of the participants have a diploma, 102 (45.7%) have a First Degree while 115 (51.6%) have Master's degree.

In terms of occupation 40 (17.9%) of respondents are currently working on Managerial and Directorial Roles while 21 (9.4%) of the respondents are working as Team Leaders and Coordinators. 137 (61.4%) of the respondents are working as Technicians, Officers, Advisors and Senior technical experts while 25 (11.2%) of the respondents are working as Junior officers and Assistants.

Given their work experiences, 39 (17.5%) respondents have a work experience ranging from 1-3 Years, 59 (26.5%) respondents have a work experience ranging from 4-7 Years, 38 (17%)

respondents having a work experience ranging from 8-10 years and 87(39%) of respondents have more than 10 years of work experience.

S/N	Demography	Characteristics	Frequency	Frequency in %
		College Diploma	6	2.7
		First Degree (BSc, BA)	102	45.7
		Second Degree (MSc, MA)	115	51.6
1	Educational Qualification	**Total**	**223**	**100**
		Managers & Directors	40	17.9
		Team leaders & Coordinators	21	9.4
		Technicians, officers, Advisors and senior technical experts	137	61.4
		Assistants, Junior Officers	25	11.2
2	Current Position	**Total**	**223**	**100**
		1-3yrs	39	17.5
		4-7yrs	59	26.5
		8-10yrs	38	17
		>10yrs	87	39
3	Work Experience	**Total**	**223**	**100**

Table 4.1 Respondents' Profile

4.3 Average Shipment Delivery Time at UNOPS Ethiopia

To check the average shipment delivery time for UNOPS Ethiopia shipments, the mean value of the shipment delivery time for air and sea shipments was analyzed separately using descriptive statistics.

Average delivery time (Air) = Total Number of Days taken to deliver shipments
Total number of air shipments cleared

Where:

- Average delivery time (Air) is the average number of days it takes for UNOPS Ethiopia to deliver shipments to partners

- Total Number of Days taken to deliver shipments is the number of days it takes for a shipment to be delivered to a partner from its arrival at the airport.

- The total number of shipments cleared is the total number of air shipments handled by UNOPS Ethiopia

Average delivery time (Air) = 4,416 days/208 shipments = 21.23 days

Average delivery time (Sea) = Total Number of Days taken to deliver shipments
Total number of sea shipments cleared

Where:

- Average delivery time (sea) is the average number of days it takes for UNOPS Ethiopia to deliver shipments to partners in the past five years

- Total Number of Days taken to deliver shipments is the number of days it takes for a shipment to be delivered to a partner from its arrival at the port of Djibouti.

- Total number of shipments cleared is the total number of sea shipments handled by UNOPS Ethiopia in the past five years

Average delivery time (Sea) = 6,822 days/133 shipments = 51.29 days

Average Delivery Time in Number of Days			
Mode of Shipment	**Maximum**	**Minimum**	**Average**
Air Shipments	49	2	21.23
Sea Shipments	199	7	51.29

Table 4.2. Average Delivery Time in Number of Days

Source: UNOPS Shipment monitoring tool

As per the logistics SOP of UNOPS Ethiopia, there is a shipment delivery lead time in the form of KPI for Air and Sea shipments. Shipments are considered delivered on time if they are delivered at the given lead time or in a shorter period. Air shipments are expected to be delivered to partners within 10 days of arrival at the Airport and sea shipments are expected to be delivered within 20 days after their arrival at dry or sea ports.

As per the five years data analyzed from UNOPS shipment monitoring tool for both Air and Sea shipments the on time delivery rate is 12% and 19% respectively. This shows more than 80% late deliveries both for Air and Sea shipments of UNOPS. (Tables 4.3 and 4.4)

Air Shipment Delivery		
Number of shipments delivered on time	**Total Delivery**	**On-Time delivery rate**
26	208	12%

Table 4.3 Air Shipment Delivery Rate: source data collected

Source: data collected from UNOPS shipment monitoring tool

Sea Shipment Delivery		
Number of shipments delivered on time	**Total Delivery**	**On time delivery rate**
25	133	19%

Table 4.4 Sea Shipment Delivery Rate

Source data collected from UNOPS shipment monitoring tool

Overall Order-to-Delivery Rate for UNOPS Ethiopia Shipments

On-time delivery rate (%) = (Number of on-time deliveries) * 100 = (51) *100 = 14.96%

Total number of deliveries 341

4.4. Analysis of Data using Logistic Regression

Logistic Regression

Logistics regression is a statistical model that is used to forecast the probability of a binary result. This model analyzes the likelihood that an event will occur by examining the relationship between multiple independent variables and one categorical dependent variable (Park, 2013).

Case Processing Summary

Case Processing Summary			
Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	223	100.0
	Missing Cases	0	.0
	Total	223	100.0
Unselected Cases		0	.0
Total		223	100.0

a. If weight is in effect, see classification table for the total number of cases.

Table 4.5. Case Processing Summary

The above table which is the case processing summary provides information regarding cases that

were included and excluded from the data analysis. The case processing summary is vital for understanding that was used to fit the logistics regression model. It helps in identifying if there are any possible issues with the data being analyzed such as missing or extreme values.
The Case Processing Summary indicates that a total of 223 cases are included in the analysis and there are no missing cases.

Dependent Variable Encoding

This is the process of converting the dependent variable in a logistic regression model into a numeric format that can be used by the model (Hosmer et.al, 2013). In this study the dependent variable is encoded as per the below table.

Dependent Variable Encoding	
Original Value	Internal Value
Delay	0
No Delay	1

Table 4.6 Dependent Variable Encoding

As depicted in table 4.6, the dependent variable in this research which is the delivery time was categorized as to have a "Delay" or "No Delay".
In order to convert the dependent variable into a numeric format, the dependent variable (Delivery Time) is encoded as follows:

- **'0'** for **'no'** which means **there is a delay**.
- **'1'** for **'yes'** which means **there is no delay**.

Block 0: Beginning Block

This is a model that does not include any explanatory variables, i.e. the baseline model. For the baseline model only the dependent variable which is on-time delivery was considered in the analysis. At this stage none of the explanatory (independent) variables (customs clearance, logistics infrastructure, ease of arranging international shipments, logistics service providers' performance, trackability and traceability) were actually included in this baseline model (Block

0) to assess the overall fitness of the model and to compare it to a model that includes the independent variables (Hosmer, et.al, 2013).

Classification Table [a,b]					
			Predicted		
			On Time Delivery		Percentage Correct
Observed			Delay	No Delay	
Step 0	On Time Delivery	Delay	170	0	100.0
		No Delay	53	0	.0
	Overall Percentage				76.2

Table 4.7 Classification Table

a. Constant is included in the model.

b. The cut value is .500

The classification table in a logistic regression model under block 0 model summarizes the performance of the model when no independent variables are included. It is also known as the null model. The performance of the logistic regression model with independent variables can be measured against a baseline model. The number of true positives, false positives, true negatives and false negatives given the anticipated probability of 0.5 are displayed in the classification table for the null model.

According to table 4.7 the observed section shows the actual number of 0's and 1's that are observed in the dependent variable which are 170 and 53 respectively. The predicted section shows predicted values of the dependent variable that are predicted by the logistic regression model which showed that all cases are classified to 0 value of the dependent variable. The overall percentage in the table indicates the percentage of cases for which the dependent variable was correctly predicted by the model. In this null model the overall percentage was found out to be 76.2 = 170/223.

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1.166	.157	54.884	1	.000	.312

Table 4.8 Variables in the Equation

In the table above the constant value shows the anticipated likelihood that the dependent variable would equal 1 when all independent variables are equal to 0. The constant value B is the

coefficient for the constant, which is also called the intercept in the null model. As shown in the above table the value for the constant value B is -1.166 which indicates that a one-unit increase in the independent variable is associated with a decrease in the log odds of the dependent variable being equal to 1. The S.E. value which is equivalent to .157 is the standard error of the B value. The standard error is a measure of the uncertainty of the B value. On the other hand, the Wald and Sig under the variables in the equation table are used to test the statistical significance of the coefficients. The Wald statistic is a chi-square test that tests the null hypothesis that the constant equals 0. This hypothesis is rejected because the p-value (listed in the column called "Sig.") 0.000 is smaller than the critical p-value of .05 (or .01). Hence, we conclude that the constant is not 0.

The df in the above table shows the degrees of freedom for the wald chi-square test. There is only one degree of freedom because there is only one predictor in the model, namely the constant. The exponentiation of the B coefficient is an odds ratio. This value is given by default because odds ratios can be easier to interpret than the coefficient, which is in log-odds units which is computed as 53/170 = .312.

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Customs Clearance	107.154	1	.000
		Logistics Infrastructure	18.233	1	.000
		Ease of arranging international shipments	4.099	1	.043
		Logistics Service providers' Performance	.045	1	.832
		Trackability and Traceability	4.462	1	.035
	Overall Statistics		114.783	5	.000

Table 4.9. Variables not in the Equation

The variables not in the equation table in a logistic regression model under block 0 model are the independent variables that were not included in the model. This is also named as the null model. As indicated in the above table, Score and Sig. are score tests that are used to predict whether or not an independent variable would be significant in the model. Looking at the p-values located in the column labeled "Sig." , we can see that customs clearance and logistics infrastructure would

be statistically significant; however, Ease of arranging international shipments, logistics service providers' performance and trackability and traceability are not significant. df – This column lists the degrees of freedom for each variable. Each variable to be entered into the model, namely customs clearance, logistics infrastructure, Ease of arranging international shipments, logistics service providers' performance and trackability and traceability has one degree of freedom, which leads to the total of five shown at the bottom of the column. The overall statistics shows the result of including all of the predictors into the mode.

Block 1: Method = Enter

This is a regression model that includes the explanatory variables (independent variables) namely: Customs Clearance, Logistics Infrastructure, Ease of Arranging International Shipments, Logistics Service Providers' performance and Trackability and Traceability.

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	135.775	5	.000
	Block	135.775	5	.000
	Model	135.775	5	.000

Table 4.10 Omnibus Tests of Model Coefficients

The Omnibus Tests of Model Coefficients is used to check that the new model (with explanatory variables included) is an improvement over the baseline model. It uses chi-square tests to see if there is a significant difference between the Log-likelihoods (specifically the -2LLs) of the baseline model and the new model. Here the chi-square is highly significant (chi-square = 135.775, df=5, p<.000). Therefore, the new model is significantly better and explains more of the variance in the delivery time.

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	108.801[a]	.456	.685

Table 4.11 Model Summary

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

The Model Summary provides the -2LL and pseudo-R2 values for the full model. The -2LL

value for this model (108.801) is compared to the -2LL for the previous null model in the 'omnibus test of model coefficients' (135.775) which indicated that there was a significant decrease in the -2LL, i.e. that the new model (with explanatory variables) is significantly better fit than the null model. The R^2 values tell approximately how much variation in the delivery time is explained by the model (like in linear regression analysis). From the above table, Nagelkerke's R2 suggests that the model explains roughly 68% of the variation in the delivery time.

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	7.178	8	.518

Table 4.12 Hosmer and Lemeshow Test

The Hosmer–Lemeshow test is a statistical test for goodness of fit for logistic regression models. If the p-value is less than 0.05, then the model is a significant model that should be further interpreted. if the p-value is more than 0.05 then the model does not have a significant model and the results should be reported. The table suggests that the model is a good fit to the data as p=0.518 (>.05)

Collinearity Diagnostic

		Collinearity Statistics
Model		VIF
1	(Constant)	
	Customs Clearance	1.125
	Logistics Infrastructure	1.051
	Ease of Arranging International Shipments	1.099
	Logistics Service Providers' Performance	1.053
	Trackeability and Traceability	1.035
	a. Dependent Variable: On-time Delivery	

Multicollinearity is a statistical concept where several independent variables in a model are correlated. Two variables are considered perfectly collinear if their correlation coefficient is +/- 1.0. Multicollinearity among independent variables will result in less reliable statistical inferences. Multicollinearity occurs when two or more independent variables in a data frame have a high correlation with one another in a regression model. One way to detect

multicollinearity is by using a metric known as the variance inflation factor (VIF), which measures the correlation and strength of correlation between the predictor variables in a regression model. The value for VIF starts at 1 and has no upper limit. A general rule of thumb for interpreting VIFs is as follows:

- A value of 1 indicates there is no correlation between a given predictor variable and any other predictor variables in the model.
- A value between 1 and 5 indicates moderate correlation between a given predictor variable and other predictor variables in the model, but this is often not severe enough to require attention.
- A value greater than 5 indicates potentially severe correlation between a given predictor variable and other predictor variables in the model. In this case, the coefficient estimates and p-values in the regression output are likely unreliable.

The above table indicates that the value of VIF is between 1 and 5 implies that there is a moderate correlation between the independent variables but it is not severe.

Classification Table[a]

Observed			Predicted		
			On Time Delivery		Percentage Correct
			Delay	No Delay	
Step 1	On Time Delivery	Delay	166	4	97.6
		No Delay	15	38	71.7
	Overall Percentage				91.5

a. The cut value is .500

Table 4.13. Classification Table

The classification table in a logistic regression model output is a table that provides accuracy of the model, that is, the accuracy of classifying positives and negatives. It is another way of evaluating the fit of a given logistic regression model. The table indicated that the new model correctly classifies the delivery time for 91.5% of the cases compared to 76.2% of the base model (Block 0). This shows a marked improvement.

The observed section indicates the number of 0's and 1's that are observed in the dependent variable which are 166 and 15 respectively. Under the predicted section the predicted values of the dependent variable based on the full logistic regression model. This table shows how many

cases are correctly predicted. Accordingly, 166 cases are observed to be 0 (there is delay) and are correctly predicted to be 0. It is also indicated that 38 cases are observed to be 1 (no delay) and are correctly predicted to be 1. On the other hand we can see from the above table that there are cases that were not correctly predicted. It is found out that 4 cases are observed to be 0 (delay) but are predicted to be 1 and 15 cases are observed to be 1 but are predicted to be 0. However, the overall percentage shows the overall percent of cases that were correctly predicted by the full model that we specified. As can be seen in the table, this percentage has increased from 76.2 while using the null model to 91.5 while using the full model.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Customs Clearance	4.070	.692	34.553	1	.000	58.544	15.071	227.414
	Logistics Infrastructure	2.020	.508	15.790	1	.000	7.537	2.783	20.410
	Ease of Arranging International Shipments	-.113	.247	.210	1	.646	.893	.550	1.450
	Logistics Service providers' Performance	.446	.498	.801	1	.371	1.562	.588	4.150
	Trackability and Traceability	-.325	.245	1.761	1	.184	.723	.447	1.168
	Constant	-16.031	3.114	26.495	1	.000	.000	15.071	

a. Variable(s) entered on step 1: Customs Clearance, Logistics Infrastructure, Ease of Arranging International Shipments, Logistics Service Providers' Performance, Trackability and Traceability.

Table 4.14. Variables in the Equation

The above table provides the regression coefficient (B), the standard of error (S.E.), the Wald and Sig. (to test the statistical significance) and Odds Ratio (Exp (B)) for each variable category.

B are the values for the logistic regression equation for predicting the dependent variable from the independent variable. They are in log-odds units. Therefore, the prediction equation is:

log(p/1-p) = -16.031 + 4.070*VAR00002 + 2.020*VAR00003 -0.113*VAR00004 + 0.446*VAR00005-0.325*VAR00006

Where p is the probability of achieving delivery time, i.e. there is no delay in delivery time. These estimates tell about the relationship between the independent variables and the dependent variable, where the dependent variable is on the logit scale.

These estimates tell the amount of increase or decrease depending on the sign of the coefficient in the predicted log odds of no delay in delivery time = 1 that would be predicted by a 1 unit increase (or decrease) in the predictor, holding all other predictors constant. For the independent variables which are not significant, the coefficients are not significantly different from 0. In the above model, the coefficients for ease of arranging international shipment, logistics service providers' performance and trackability and traceability of shipments, are not significantly different from zero.

Since the coefficients in the logit model are in log-odds units, they are often difficult to interpret, so it needs to be converted into odds ratios, which is given as EXP(B) in the above table. They are the exponentiation of the coefficients.

The S.E. are the standard errors associated with the coefficients. The standard error is used for testing whether the parameter is significantly different from 0; by dividing the parameter estimate by the standard error we obtain a t-value. The standard errors can also be used to form a confidence interval for the parameter. On the other hand, Wald and Sig. values provide the Wald chi-square value and 2-tailed p-value used in testing the null hypothesis that the coefficient (parameter) is 0. Coefficients having p-values less than alpha are statistically significant.

According to the analysis from Table 4.14 and from the prediction equation the results per the independent variable are discussed below.

4.5. Factors Affecting Shipment Delivery Time

4.5.1. Customs Clearance vs On-Time Delivery

From the result under table 4.14 for every one-unit increase in customs clearance, we expect a 4.070 increase in the log-odds of no delay in delivery time holding all other independent variables constant. This indicates that improving custom clearance is associated with increased odds of achieving on-time delivery. In addition, for the independent variable customs clearance, the respective p-value is .000 which is <0.05 which shows that there is a significant and positive relationship between customs clearance and on-time delivery. This indicates that the null hypothesis H0a which states that customs clearance does not effect on-time delivery would be rejected. In other words, improving customs clearance is associated with increased odds of achieving on-time delivery.

The above result was supported by qualitative data collected during semi-structured interviews. In the interview, it was indicated that customs clearance procedures have a huge impact on expediting the delivery of UNOPS shipments. Respondents, even though mentioned that there is an improvement in clearance procedures over time as most procedures are completed in a single window system, there is still a lack of clarity on customs processes and procedures. It was also indicated that customs processes are delayed due to a lack of trained customs officers, a lack of portals to update and communicate newly placed customs policies and procedures.

The finding of this research is in line with a study conducted by Endashaw (2020) where he identified that there is a delay in customs clearance for import shipments. According to him the delay in customs clearance has an impact on import goods efficiency. Wondwosen (2020) also indicated that the overall customs clearance procedures, lack of clarity of customs proclamation, and lack of skilled customs officers affect the performance of the whole supply chain process by delaying imported shipments at customs.

Ojala L. & Celeb D. (2015) also indicated that the effectiveness of processes in the clearance and delivery of shipments and the transparency of customs clearance procedures are the primary factors in supply chain efficiency across nations.

4.5.2. Logistics Infrastructure vs On-Time Delivery

From the analysis depicted under table 4.14 for every one-unit increase in logistics infrastructure we expect a 2.020 increase in the log-odds of no delay in delivery time holding all other independent variables constant. The coefficient for the variable logistics infrastructure is highly significant and positive. Similar to the variable customs clearance this also indicates that improving logistics infrastructure is associated with increased odds of achieving on time delivery. Data was analyzed to check if there was a significant relationship between the independent variable logistics infrastructure and the dependent variable on-time delivery using the p-value. Accordingly, a p-value of .000 was found from the analysis which is <0.05 alpha indicating there is a significant relationship between logistics infrastructure and on-time delivery. This shows that the null hypothesis (H0b) which states that logistics infrastructure does not affect According to the information collected through the interview, infrastructure is believed to be very important for the timely and safe delivery of shipments. However, it was stated that the current infrastructure highly impacts delivery due to the use of monopolized ports, processing times of ports, availability of port facilities, and the like. It is also indicated that the roads that connect the port to the cities are not in good road condition and there is also a lack of alternative roads to consider when there are conflicts, damages to roads, and changes in weather conditions.

This finding was supported by a study conducted by Fekadu (2013). In his study, he indicated that there is a low level of logistics infrastructure development in Ethiopia such as inadequate fleets of freight vehicles and lack of sea ports which contribute to Ethiopia's poor logistics management system.

According to Bai. et al, 2004; Blyde and Monlina, 2015 stated in their study that effective network design is vital for domestic and international logistics to timely deliver goods to customers which supports the findings of this research.

Different studies conducted by Li, Wang & Zhang (2020); Odeck (2004) are also in line with the research findings of this study. In their study, they indicated that a well-established logistics infrastructure such as a reliable and efficient transportation network, adequate storage facilities, information technology systems that can track the movement of goods and skilled workforces are vital in reducing delivery time which.

4.5.3. Ease of Arranging International Shipments Vs On-Time Delivery

On the other hand, the p-value for the variable ease of arranging international shipment was found to be .646 which is greater than 0.05. This indicates that as per the result of this study there is no significant relationship between the ease of arranging international shipments and on-time delivery. Therefore, we accept the null hypothesis (H0c) which states that tractability and traceability of shipment does not effect on-time delivery.

According to Liu et al. (2019) the ease of arranging international shipments positively influenced delivery time which is different from the findings of this study. Similarly, a study by Chen et al. (2020) found that the ease of arranging international shipments was positively related to delivery time, and that businesses that were able to arrange international shipments easily were able to deliver goods more quickly than those that faced difficulties in arranging shipments.

On the contrary, a study conducted by Hsu et al. (2018) found that the ease of arranging international shipments had no significant effect on delivery time which supports the findings of this study.

4.5.4 Logistics Service Providers' Performance Vs On-time Delivery

For the independent variable logistics service providers' performance, there was a p-value of .371 which is greater than 0.05. This result indicated that the null hypothesis (H0d) can be accepted, which is that logistics service providers' performance does not affect on-time delivery.

The finding of this study is not in line with a study conducted by Essete (2019) which indicated that poor efficiency of customs clearing agents' performance delayed the delivery of shipments. Wang & Chen (2019) also indicated that logistics service providers' performance had a positive impact on delivery time. According to their study, logistics service providers that had higher performance demonstrated shorter delivery time than those who did not.

Studies conducted by Kumar &Shankar (2020); Siddiqui & Akram (2021); and Arun &Shankar (2022) further confirm that there is a positive relationship between the performance of logistics service providers and delivery time which does not support the findings of this research.

4.5.5. Trackabilty and Traceability of Shipments Vs On-Time Delivery

The p-value for this independent value was also found to be greater than 0.05 alpha which is .184. This indicates that the independent variable (trackability and traceability of shipments) has a statistically insignificant relationship with the dependent variable on-time delivery. As a result, the null hypothesis (H0e) which is that trackabilty and traceability of shipment does not affect shipment delivery time was accepted. This indicates that as per the result of this study, there is no significant relationship between trackability and traceability of shipments and on-time delivery.

A study conducted by Kelleher and Kelliher (2005) found that delivery time was not significantly affected by implementation technologies for tracking and tracing shipments which is in line with the finding of this study regarding the trackability and traceability of shipments. However, according to a study conducted by Ferrell et al. (2010) companies that had implemented technology for tracking and tracing their shipments had improved delivery times and reduced errors which is different from the findings of this study.

Accordingly, for the variable customs clearance and logistics infrastructure since their respective p-value is .000 the null hypothesis H0a and H0b would be rejected. This implies that Customs clearance, regulation and procedure, and logistics infrastructure affect on-time delivery.

On the other hand, since p-values for ease of arranging international shipment, logistics service providers' performance, and trackability and traceability of shipments are greater than 0.05 we accept the null hypothesis H0c, H0d and H0d. This implies that ease of arranging international shipments, logistics service providers' performance, and trackability and traceability of shipments do not affect on-time delivery.

Chapter Five

5. Summary, Conclusions and Recommendations

In this chapter of the research major findings of the research, the conclusions drawn based on the findings and recommendations that ought to be useful are presented.

5.1 Summary of Major Findings

The main purpose of this study was to identify factors that affect the shipment delivery time of the UNOPS Ethiopia office.

To give answers to the above basic questions the researcher prepared and distributed close-ended questionnaires, used secondary data from the organization under study and gathered information through a semi-structured interview to substantiate the findings. Descriptive statistics and logistic regression analysis were used to analyze the data.

5.1.1 Respondents Background

a. Majority of the respondents, that is 51.6%, were respondents with an educational background who have Master's degree followed by 45.7% of the respondents having a first degree. This indicates that most of the respondents are well educated which is expected to help them conceptualize and respond appropriately to the questions raised in the questionnaire.
b. 61.4% of the respondents are working as senior technical experts, officers and advisors, 17.9% of them are working on managerial and directorial roles and 9.4% of the respondents are working as team leaders and coordinators. Only 11.2% of the respondents are junior officers and assistants. This shows that the majority of the respondents have the expertise and seniority to understand and give feedback to the questions raised in the questionnaire in a professional manner.
c. Only 17.5% of the respondents have a work experience of three years and below. This indicates that most of the respondents have a good working knowledge of the subject under investigation.

5.1.2. The result of this study indicated that based on the data gathered through primary (questionnaire and interviews) and secondary data the findings, there is a delay in delivering UNOPS Ethiopia's shipment on time. From the secondary data, it is indicated that the average or mean value of delivery time for air shipment is 21.23 days and 51.29 days for sea shipments. The finding also revealed that only 12% of air shipments and 19% of sea shipments are delivered as per the KPI. Additionally, the overall OTD rate for UNOPS Ethiopia was found to be 14.96%. Therefore, this answers the first research question regarding the average order-to-delivery time it takes for UNOPS Ethiopia to deliver shipments to partners.

5.1.3 From the study conducted factors such as customs clearance and logistics infrastructure were found to have a significant effect on shipment delivery time. Based on the findings from the logistics regression analysis model, customs clearance was found to have a highly significant and positive effect on the delivery time with $p<.000$ and odds ratio (Exp(B)) of 58.544. This indicates that improving customs clearance is highly associated with increased odds of achieving better delivery time.

5.1.4 Based on the finding from the logistics regression analysis model, logistics infrastructure was found to have a high significant and positive effect on the delivery time with $p<.000$ and odds ratio (Exp(B)) of 7.537. This indicates that availability of a well-established logistics infrastructure is highly associated with increased odds of achieving better delivery time.

5.1.5. As per the findings of this study factors such as ease of arranging international shipments, performance of logistics service providers and tractability and traceability of shipments were found to have an insignificant effect on shipment delivery time with p-values of .646, .371, and .184 respectively for UNOPS Ethiopia shipments. This indicates that ease of arranging international shipments, performance of logistics service providers, and trackability and traceability of shipments don't affect shipment delivery time.

5.2 Conclusions

The main objective of this study was to investigate the average order-to-delivery time for UNOPS Ethiopia's shipments and to assess the effect of customs clearance, logistics infrastructure and logistics service providers, ease of arranging international shipments, and tracking and traceability of shipments on timely delivery. A five-year air and sea shipment delivery was used to determine the impact of the independent variables on OTD.

Based on the summary of the findings of the study the following conclusions were drawn.

5.2.1. The result of the research study revealed that the average delivery time for UNOPS Ethiopia shipments is 21.23 days and 51.29 days for air and sea shipments respectively. The finding also revealed that only 12% of air shipments and 19% of sea shipments are delivered as per UNOPS' KPI. Additionally, the overall OTD rate for UNOPS Ethiopia was found to be 14.96% which indicated only 14.96% of total shipments were delivered within the delivery timeline.

5.2.2. Customs clearance processes and procedures and logistics infrastructure have a significant effect on shipment delivery time.

5.2.3. Ease of Arranging International Shipments, Logistics Service Providers' Performance and Trackabilty and Traceability of Shipments do not have a significant effect on shipment delivery time.

5.3 Recommendations

Inevitably, delivering an order to the final customer promptly is very crucial.

Based on the summary of the findings of the study, the following possible solutions are recommended.

1. In this study it was found that customs clearance processes and procedures have a significant impact on delivery time. The reasons for the delay in customs clearance were stated as delay in the customs clearance process, lack of clarity on customs processes and procedures, lack of trained customs officers, and lack of portals to update and communicate newly placed customs policies and procedures. Therefore, the facilitation of customs clearance processes by customs, provision of training to customs officers, and establishment of a systematic way to update all stakeholders on newly placed customs policies and procedures will enhance the customs clearance process and will result in reduced delivery time.
2. Logistics infrastructure has a significant impact on shipment delivery time. The element of logistics infrastructure includes facilities such as ports, roads, and fleets. Improving the country's logistics infrastructure by considering alternative sea ports, maintenance of roads from the port to different parts of the country, and ensuring road safety along the transport corridor will help improve the logistics infrastructure which will in turn improve the delivery time for shipments.
3. It is the recommendation of the researcher for different stakeholders to collaborate on achieving OTD as the country is losing hard currency through demurrage and port storage charges.
4. It is better if UNOPS Ethiopia works very closely with suppliers, logistics service providers, customs authorities and partners to improve the average shipment delivery time.

5.4. Limitation of the Study

This study used World Bank's Logistics Performance Indicators which are set to measure logistics performance of countries. In the research on time delivery was considered to be the dependent variable whereas customs clearance, logistics infrastructure, Ease of arranging international shipments, logistics service providers' performance and trackability and traceability of shipments were considered to be the independent variables. Since the researcher only considered the LPI indicators as variables the study didn't look into other variables which might affect delivery time significantly. According to Arvis,et al (2018) external factors such as supply chain disruptions related to political risks or weather conditions can affect shipment delivery time. However, these factors were not considered in this research.

OTD was used to measure the average number of days it takes UNOPS Ethiopia to deliver shipments to its partners. However, according to Qiu and Wang (2012) the OTD metrics do not take into account other important factors such as accuracy, completeness, damage, cycle time and total cost of delivering a shipment.

The researcher used a logistic regression model to analyze if there is a relationship with the dependent variable and the independent variables. According to Fahrmeir, L., Kneib, T., Lang, S., and Marx, B. (2009) this model can be sensitive to outlier and a few extreme values can have a significant impact on the model's predictions.

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Annex 1

QUESTIONNAIRE

ADDIS ABABA UNIVERSITY
COLLEGE OF COMMERCE SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Dear respondents:

I'm a graduate student at Addis Ababa University College of Commerce in the Department of Logistics and Supply Chain Management. Currently, I'm conducting a research entitled ***'Factors Affecting Shipment Delivery Time: The Case of UNOPS Ethiopia Office'*** as a partial requirement for the award of Masters of Arts Degree in Logistics and Supply Chain Management.

The purpose of this questionnaire is to gather data for the proposed study, and hence you are kindly requested to assist in the successful completion of the study by providing the necessary information. Your participation is entirely voluntary and the questionnaire is completely anonymous. I confirm that the information you share will stay confidential and only be used for the aforementioned academic purpose, thus not affecting you in any way. So, your genuine, frank, and timely response is vital for the success of the study. I want to thank you in advance for your kind cooperation and dedication of your precious time to filling out this questionnaire.

Sincerely yours,

Kalkidan Takele

Note:

- No need to write your name.
- Indicate your answer with a check mark () on the appropriate block/cell both for multiple choice and Likert scale questions.
- If you need further explanation you can contact me and discuss the matter freely at Telephone no. 0911685646, Email: mitutakele@yahoo.com

Section I: Respondents Profile:

- **Educational Qualification:**

☐Below college diploma ☐College diploma ☐First Degree (BSc, BA)

☐Second Degree (MSc, MA) ☐PhD

- **Current Position/Job Title _____**

- **Years of Work Experience:**

☐1 to 3 years ☐4 to 7 years ☐8 to 10 years ☐above 10 years

Section II: Delivery Time

Considering UNOPS Ethiopia's shipment delivery time key performance indicators, i.e. 10 days for air shipments and 20 days for sea shipments kindly please indicate if there is an overall delay in delivery or not by ticking one of the below boxes.

There is **Delay** ☐

There is **No Delay** ☐

Section III: Factors Affecting Shipment Delivery Time

Please indicate your choice by putting the tick mark () on the appropriate cell. **Where, 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree**.

- Please indicate the degree to which you agree with the following statements regarding factors affecting UNOPS Ethiopia's shipment delivery time.

No.	Measurement Items	Score				
		1	2	3	4	5
• **Customs Clearance**						
1.1	Customs clearance process is completed within a reasonable time frame					
1.2	Customs clearance process is cost-effective considering fees duties and other related expenses					
1.3	There is a clear and transparent communication by customs regarding customs process, requirements and relevant information					
1.4	Customs clearance process is predictable with clear expectations and a reliable timeline.					
1.5	Customs procedures are simple and easy to understand and navigate					
• **Logistics Infrastructure**						
2.1	The logistics infrastructure provides efficient and well connected transportation links to support the smooth movement of goods					
2.2	There are high-quality and adequately sized facilities to handle the volume of goods efficiently					
2.3	The logistics infrastructure demonstrates high reliability and resilience to handle disruptions and maintain smooth operations.					

2.4	There are well-maintained roads, railways and other transportation infrastructure across the supply chain					
2.5	There are sufficient transport facilities (e.g. ports, airports, rail terminals) to support trade flows					
• **Ease of Arranging International Shipments**						
3.1	The documentation requirements for arranging international shipments are clear and straightforward					
3.2	There is a wide range of shipping options and services available for arranging international shipments					
3.3	Customs procedures for arranging international shipments are efficient and well-organized					
3.4	There is adequate visibility and tracking capabilities to monitor the progress of international shipments					
3.5	The customer support provided by logistics service providers is prompt, helpful and responsive					
• **Logistics Service Providers' Performance**						
4.1	Logistics service providers consistently deliver shipments on time					
4.2	Logistics service providers ensure accurate handling and delivery of shipments without errors or damages					
4.3	Logistics service providers promptly respond to inquiries, requests, and issues related to shipment handling and delivery.					
4.4	Logistics service providers provide excellent customer service, addressing concerns and meeting customer needs efficiently.					
4.5	Logistics service providers offer cost-effective solutions without compromising service quality.					
• **Shipment Trackability and Traceability**						
5.1	There is an effective method in place (tracking numbers) in place which accurately and uniquely identifies shipments.					
5.2	There is a reliable and accurate location tracking update for shipments.					
5.3	Shipment related activities (loading, unloading, customs clearance etc) captured as event logs are comprehensive and detailed.					

5.4	Tracking and traceability data are well integrated across different systems or stakeholders involved in the shipment process					
5.5	The tracking and traceability data captured during the shipment process is accurate and reliable.					
5.6	There is an easy and timely access to the necessary shipment data for tracking and traceability purposes by authorized parties					

Annex 2

Interview Questions

Interview Guideline

1. How frequently do you import goods? How frequently do you encounter delays in the delivery of your shipments? How important is on-time delivery for your shipments to your organization's operations?
2. How satisfied are you with the current customs clearance procedures in place? In your opinion, what are the main factors that contribute to delays in customs clearance procedures? What suggestions do you have for improving customs clearance procedures to minimize delays and expedite the delivery of shipments?
3. How important is infrastructure to the timely delivery of shipments? In your opinion, which infrastructure factors have the greatest impact on shipment delivery time (e.g. roads, ports, airports, rail lines, telecommunications, etc.)? How does the quality of infrastructure in the areas where you operate affect your ability to receive shipments on time? What improvements would you like to see in infrastructure that would make your operations more efficient and reduce shipment delivery times?
4. How often do you receive international shipments ? How often have you experienced delays in receiving international shipments? In your opinion, how much does the ease of arranging international shipments affect shipment delivery time? Do you think that improving the ease of arranging international shipments will reduce shipment delivery time?
5. In your experience, how does trackability and traceability affect delivery time? How often do you receive real-time updates on the status of your shipments?
6. Can you describe the logistics service provider's role in ensuring time delivery of shipments?