Addis Ababa University

School of Commerce

Factors Affecting Effectiveness of Pharmaceutical Outbound Logistics: The Case of Some Selected Pharmaceutical Manufacturers in Addis Ababa, Ethiopia

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Addis Ababa, Ethiopia

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A THESIS SUBMITTED TO Addis Ababa UNIVERSITY SCHOOL OF COMMERCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT (LSCM)

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Prepared by: - Esete Mulatu

APPROVED BY:

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ADVISOR SIGNATURE DATE

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INTERNAL EXAMINER SIGNATURE DATE

_____ _____ _____

EXTERNAL EXAMINER SIGNATURE DATE

DECLARATION

I, Esete Mulatu**,** declare that this research titled 'An Assessment of Factors Affecting Effectiveness of Pharmaceutical Outbound Logistics: the case of some selected Pharmaceutical Manufacturers in Addis Ababa', is the outcome of my own effort and study and that all sources of materials used for the study have been duly acknowledged. I have produced it independently except for the guidance and suggestion of the Research Advisor. This study has not been submitted for any degree in this University or any other University. It is offered for the partial fulfillment of the degree of Master in Logistics and Supply Chain Management (LSCM).

Eesete Mulatu

Signature :_____

Date:_____

LETTER OF CERTIFICATION

This is to certify that EseteMulatu carried out her project on the topic entitled "An Assessment of Factors Affecting Effectiveness of Pharmaceutical Outbound Logistics: the case of some selected Pharmaceutical Manufacturers in Addis Ababa". This work is original in nature and is suitable for submission for the award of the degree of Master in Logistics and Supply Chain Management (LSCM).

Dr. Busha Temesgen (Ph.D)

Signature :_____

Date:_____

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ABSTRACT

The purpose of this study was to examine factors affecting effectiveness of pharmaceutical outbound logistics: the case of some selected pharmaceutical manufacturers in Addis Ababa. The dependent variable of outbound logistic effectiveness was explored by four independent variables (financial capacity, transport outsourcing, information system and government donors relationship). To achieve the main objective of the study, the researcher applied quantitative research approach. Questionnaires were the instrument used to collect data and data collected from 278 respondents of employees from departments of 11 selected pharmaceutical manufacturers. The responses for each variable data was analyzed by using SPSS version 25, and both descriptive and inferential data analysis methods were employed for the purpose of achieving the objectives of the study. Based on the results from regression analysis, the only significant and highest determinant of outbound logistics found to be information system and the remaining independent variables in this study have found to have insignificant influence on outbound logistics effectiveness of pharmaceuticals. Overall, all independent variables of this study resulted 30.5 % of variation observed in outbound logistic management effectiveness, the remaining 69.5% affected by other variables, which is not identified in this research and need further research. Therefore, based on the result and conclusions; recommendations were forwarded to researchers, pharmaceutical manufacturers and distributors and concerned bodies.

Key Words: Logistics, Outbound Logistics, Pharmaceuticals

1. Chapter One

1.0. Introduction

This chapter deals with background to the study and goes on stating the research problem, declaring objectives of the study and outlining research questions in line with the objective of the study. The chapter also continues with indicating both thematic and geographic scope and gives clue regarding the significance of the study. Lastly, the chapter ends by briefing conclusion and recommendations.

1.1. Background of the Study

Pharmaceuticals Outbound Logistics- Processes and activities of warehousing, managing inventory, distributing and transportation of health care products to health facilitieswhich are all involved in getting goods and services in front of consumers directly or indirectly (Kotler & Keller, 2009). Given that pharmaceutical product distribution accounts for a significant portion of overall product costs, it has become a crucial component of reconfiguration(Odoyo, 2020). Besides, pharmaceutical product distribution is a crucial component of integrated supply-chain management (USAID, 2008). In comparison to supply chains for other products, the pharmaceutical industry is more complicated, especially when taking into account the rigorous deadline and sufficiency standards.

Inadequate points in the pharmaceutical products' distribution systems make it possible for stolen, illegally imported, counterfeit, and subpar medications to enter the supply chain. Each participant in the distribution chain should adhere to the relevant procedures, laws, and regulations in order to preserve the original quality of pharmaceutical products. The principles of Good Manufacturing Practice (GMP), Good Storage Practice (GSP), and Good Distribution Practice (GDP) should be followed in every aspect of the distribution of pharmaceutical products(EFMHACA, 2018).

Despite it is everyone's right to obtain and use health commodities when they are needed, the inability of health facilities to distribute pharmaceuticals effectively and efficiently is a significant barrier. As a result, the supply and distribution of medicines are a crucial component of any successful health system. As supply chains have an effect on the availability, cost, and

quality of medicines provided to patients, disruptions to this supply of medications jeopardize health outcomes. The usage of technology can further improve daily operations' efficiency for quicker and more precise delivery(Amber S., 2021).

Meeting the health care needs of significant portions of the population, especially in rural areas, is frequently hampered by the system for the storage and distribution of medications. Despite having stock in the central warehouse, a subpar distribution system is more likely to result in stock-outs at healthcare facilities. On the other hand, a poorly functioning distribution system may necessitate more financing over time, rendering it unsustainable. The proper design and operation of a distribution system should guide by a balanced strategy that takes into account the status of technical capability, administrative structures, and resource availability at this time (Prashant Yadav, 2011).

A complicated web of factors led to the breakdown of the drug supply systems. It is unclear to what extent each of the following factors contributes, but they all probably do to some extent: insufficient funding (for both procurement and transport), weak public infrastructure, insufficient staff numbers and capacity, poor training and remuneration, inadequate storage facilities, lack of pharmacy standards, parallel procurement and distribution systems for some medicines, corruption, and theft (Livingston & Mattingly, 2021).

More specifically, as it was stated in the EPSA review meeting in April 2018, the institution's primary mission statements are to make affordable, high-quality pharmaceuticals available to all public health facilities through a revolving drug fund and capacity building to ensure proper inventory management and sensible drug use. There are some problems, nevertheless, such as delayed medical equipment acquisition, poor data quality, rising demand from healthcare institutions, and some facilities' reluctance to accept products from short expiry programs. For the Smooth distribution system, this has a significant negative impact (EPSA, 2018).

In terms of product storage procedures, warehouse management, transportation infrastructure, and other physical distribution components, as is clear from the aforementioned remark, there is a gap. As a result, the goal of this study was to evaluate the variables that affected how well pharmaceutical items were distributed by a few chosen pharmaceutical suppliers in Addis Ababa, Ethiopia.

1.2. Statement of the problem

A quick distribution of pharmaceutical supplies is essential to building a functional healthcare system. Distribution of medical supplies involves the rapid delivery of a large volume of different items (Peidro et al., 2009). However, the supply and distribution of pharmaceutical products is frequently highly centralized and is characterized by subpar storage facilities, incorrect demand planning processes, insufficient human resource management capabilities, high stock pilferage, and insufficient financing, all of which cause frequent stock outs (Cohen & Roussel, 2013). In addition, correct packaging is essential in this process to prevent degradation due to regulatory and compliance difficulties relating to storage, shipping, packing, and technical compliance (Beitzen-Heineke et al., 2017).

More particularly, the Federal Ministry of Health (FMoH) in Ethiopia has been aiming to create a healthcare supply chain that is effective and high-performing and would provide equal access to inexpensive medications for all Ethiopians. Significant advancements have been made in the distribution of medications in recent years as the pharmaceutical fund and supply agency works to increase their availability, quality, and affordability. Although several obstacles still exist, significant progress has been accomplished. These obstacles include a lack of accessible, high-quality, and inexpensive critical drugs as well as inadequate stock management that led to high levels of waste and stock outs (Karim et al., 2018). Therefore, drug shortages continue to be a problem for healthcare professionals and staff working in medical facilities.

Cooper (2006) argues that there can never be an effective pharmaceutical outbound logistic if an organization is challenged financially. Finances are used to modernize fleet, to compensate drivers, to buy enough stock for distribution and more importantly, to implement and maintain a robust information system.

While most of the previous studies had tended to focus more on the managerial aspect of distribution and outsourcing of the non-pharmaceutical distribution effort in a more advanced society, little has done in this regard in a country like Ethiopia.

This study therefore has intended to examine some important factors affecting pharmaceutical outbound logistic effectiveness of selected pharmaceutical distributors in Addis Ababa.

1.3. Research Questions

In view of the previously mentioned gaps, this study has attempted to provide answers to the following research questions:

1. To what extent does financial capacity influence the pharmaceutical outbound logistic effectiveness?
2. To what extent do transport outsourcings influence pharmaceutical outbound logistic effectiveness?
3. To what extent do information systems influence pharmaceutical outbound logistic effectiveness?
4. To what extent does donors and governments relationship on the outbound logistics effectiveness of pharmaceuticals?

1.4. Objectives of the Study

1.4.1. General Objectives of the Study

As the main objective, this research paper has tried to assess factors affecting the effectiveness of outbound logistics (by taking some pharmaceuticals manufacturers and distributors in Addis Ababa city administration**.**

1.4.2. Specific Objectives of the study

- To assess effect of financial capacity on effectiveness of outbound logistics.
- To assess effect of transport outsourcing on effectiveness of outbound logistics.
- To examine effect of information systems on effectiveness of outbound logistics.
- To examine the impact of donors and governments relationship on the effectiveness of outbound logistics.

1.5. Significance of the Study

Given the increased attention of achieving effective supply chain management particularly in pharmaceutical industries around globe, this study seek to assess factors affecting the outbound logistics effectiveness of pharmaceuticals in Addis Ababa. This study expected to provide

relevant information's to the current product distribution of pharmaceutical products in Ethiopia. Besides, for the researcher it helps to identify and gave broad understanding on the outbound logistics performance of pharmaceutical suppliers in Addis Ababa. Last but not least, it can act as a blueprint for action for infant producers and suppliers in the market and as a knowledge repository for additional study work in building efficient distribution channel strategies for various pharmaceutical suppliers found in the country.

1.6. Scope of the Study

Geographical scope: the study has focused on the overall outbound logistics management practice of a fast-growing pharmaceutical company in Addis Ababa.

Conceptual range: Once more, the research work is restricted to a few elements that affect the efficiency of outbound logistics. The research effort is restricted to four aspects, namely the interaction between donors and governments, financial capability, outsourcing of the transport system, and information system, and their effects on the efficiency of some distribution centers in Ethiopia.

Methodological Focus: To determine the strength and direction of the relationship between the dependent and independent variables, this research relies on the use of correlation and regression analytic tools. Once more, the research's data came from both primary and secondary sources.

1.7. Definition of Terms

- **Pharmaceuticals:** Any chemical compound intended for use in the medical diagnosis, cure, treatment, or prevention of disease—also referred to as medicine, medication, or medicament—is considered to fall under this definition (USAID, 2008).
- **Pharmaceuticals Outbound Logistics-** Health care product distribution, inventory management, warehousing, and transportation processes and operations (Morris et al., 2009).
- **Access to Medicines means: -** those individuals should be able to obtain the necessary medications to maintain their health (WHO, 2010).
- **Essential Medicines** - are medications that meet the population's most pressing healthcare need. They are life-saving and were chosen after taking into account their

relevance to public health, the available proof of their effectiveness and safety, and comparative cost-effectiveness. (WHO, 2010)

- **Program Pharmaceuticals:** medicines acquired through gift. They include medications for treating HIV/AIDS, contraceptives for family planning, TBL medications, medications for treating malaria, vaccinations and vaccine accessories, and dietary supplements. (EPSA official website)

1.8. Organization of the Paper

This research project has divided into five chapters. The introduction, background of the study, problem statement, research question, purpose of the investigation, research hypotheses, significance of the study as well as scope and constraints of the study, are all included in the first chapter. The second chapter examines the literature that has already published, focusing on debates and reviews of the literature that connect to the research's main topics. The third chapter explains the research methods used; this covers the research instrument, survey administration, study area, population, sample, and sampling methodologies, it also covers the data analysis process. The data gathered from the fieldwork has compiled, examined, and discussed in chapter four. Finally, chapter five have looked at the summary of the findings, conclusions, and recommendations.

Chapter Two

2. Review of Related Literatures

2.1. Introduction

This chapter is dedicated to the literature reviewed from previous writings connected to this research such as books, journals, academic and government papers, and newspaper articles and from the internet. It also provides background information about some factors affecting the outbound logistics effectiveness of pharmaceutical products.

2.2. Theoretical Review

2.2.1. Logistics:

The word logistic has originated from Greek word ‘Logistikos’ and the Latin word ‘Logisticus’ which means science of computing & calculating. During World War II logistics gained importance in army operations covering the movement of food, medicines, men & equipment across the border. Today it has acquired a broader meaning (Roth, M., Klarmann, A. and Franczyk, B., 2013). According to (Bagshaw, B.K. 2017) Logistics is what happens in the supply chain. Logistics activities (customer response, inventory management, supply, transportation, and warehousing) connect and activate the objects in the supply chain.

By managing the movement and storage of goods, services, and related data between the point of origin in an efficient and effective manner, for example, for clients or organizations, it aims to meet the needs of its customers. The property managed by logistics can include both physical items like food, supplies, animals, tools, and fluids as well as abstract items like time, data, particles, and energy. The integration of information flow, material handling, production, bundling, stock, shipping, warehousing, and typically security constitutes the logistics of physical goods more frequently than not today. Through a thoughtful activity program, the difficulties of logistics can be demonstrated, explored, visualized, and improved. Using assets as little as possible may also be a common suggestion in logistics for purpose and ship out (Li, 2014).

More specifically, pharmaceutical logistics is a mechanism by which the health system assures regular support, a supply of medicinal aids and tools, waste disposal, cleaning, sterilization, and other supporting activities related to support for the control process. The growth in pharmaceutical logistics complexity coincides with the structure and utilization of innovative supply chain plans and technology, particularly in the private sector (Hakim, Zaqiah, and Zagloel, 2018).

- **Concept of Inbound Logistics**

Inbound logistics, as defined by Ayantoyinbo et al. (2018) and Porter (2008), are activities related to the transportation, storage, and distribution of product inputs. These activities include material handling, warehousing, inventory control, vehicle scheduling, returns to suppliers, as well as the delivery of goods into the location of a business. According to Hakim, Zaqiah, and Zagloel (2018), the primary objective of inbound logistics is to lower total cost by having the appropriate materials available at the appropriate time and location. According to research, managing inbound logistics is one of the most important areas to improve within a supply chain, thus organizations should focus more on it. Given that this stage is regarded as the beginning of the supply process.

Controlling inbound logistics is crucial if you want to keep transportation costs low, according to Carter and Ferrin (1996). To cut these expenses, organizations have implemented various inbound logistics controls, such as strict transit schedules. Additionally, the flow value's inbound logistics component's expenses for materials, deliveries, administration, and inventories are included. The effectiveness of delivery planning significantly affects both performance and all logistical expenses. A high inventory of excess goods, low container usage, and higher transportation costs are all consequences of ineffective planning (Hakim et al., 2018).

The logistics functions can be viewed as a significant facilitator in a cross-functional effort for supply chain integration to fulfill future consumer expectations, which is also recognized as being of strategic importance, according to Van Niekerk and Bean (2019), who has added to the aforementioned. A company's objective with supply chain flows is to make sure expenses are managed in relation to future value creation. Additionally, this confirms the general perception in the logistics industry that providing excellent customer service entails delivering the right goods

to the right client at the right time, in the right location, and for the least amount of money (Van Niekerk et al., 2019).

- **Outbound logistics**

The movement of goods from the company to outside partners is referred to as the outbound logistics flow. According to Ayantoyinbo et al. (2018), it is expected to assist companies involved in a supply chain in increasing the dependability and effectiveness of a distribution network and further reducing and/or minimizing transportation and storage costs. Delivering goods to clients is the primary purpose of outbound logistics (Rajahonka & Bask, 2016). In addition, Porter (2008) notes that numerous tasks, such as finished goods warehousing, material handling, delivery vehicle operating, order processing, and scheduling, are related to outbound logistics, which refers to gathering, storing, and physically distributing the items to purchasers.

Finding ways to improve outbound logistics flow can also help cut costs and waste. Furthermore, a company only interacts with upstream and downstream supply chain actors through its logistics function. Therefore, outbound logistics is a crucial chain flow that can add significant value if a firm consistently reduces waste and costs (Abushaikha et al., 2018).

Outbound logistics is crucial for a firm to improve the overall relationship between the supplier and the client. Outbound logistics offers a definition for it that goes like this: "it is the movement and storage of final products required by users from the production area to the ultimate user's location" (Matthew, et al., 2016). The research of scholars have been reviewed, and they unmistakably demonstrated the link between organizational profitability and logistical performance. For instance, (Stapleton, et al., 2002) by utilizing the profit model strategy the aforementioned scholars have demonstrated the impact of logistics on organizational productivity and financial performance. In addition, this theory has been supported by a survey that demonstrates the significant impact that logistics planning has on organizational competency and industry competitiveness (Tan & Matt, 2015).

2.2.2. Logistics Management Practices

According to Ballou (2007), who was quoted by Serdaris et al. (2014), logistics procedures can be classified into main activities and support activities. Transportation, inventory management,

customer service, information flows, and order management are all crucial to the smooth operation of every business. Storage, material handling, purchasing, packing, collaboration with production/operation management, and upkeep of information systems are all examples of support practices. Customer service, inventory management, transportation, storage and material handling, packaging, information processing, demand forecasting, production planning, purchasing, facility location, and other activities for a particular organization could include tasks like after-sales parts and service support, maintenance duties, return goods handling, and recycling operations (Reddy and Jayam, 2016).

The business can create a sustained advantage that is very challenging for a rival to copy by integrating the appropriate services into a customer-focused logistics system (Reddy and Jayam, 2016).

Reddy and Jayam (2016) state that it is highly improbable that any organization demands that of specified activities can be completed. For instance, a service provider like an airline might incorporate components from the purchasing, maintenance, demand forecasting, and information processing operations into a logistics system that is intended to reach its clients. On the other side, a manufacturer of consumer goods may use customer service, purchasing, demand forecasting, materials handling, inventory management, storage, Suppliers Procurement Operations Distribution Customers, and logistical support.

The key idea is that all businesses, whether they are for-profit or nonprofit, manufacturers or service providers, desire to connect with their target audiences. By incorporating the necessary operations into a logistics system that is customer-focused,

2.3.1. Customer Service Practices

Outbound logistics are directly tied to customer service. Numerous factors within this procedure may have an impact on customer service. These can include things like ordering simplicity, stock availability, and delivery dependability. A balance must be struck between the cost of the service and its quality (Rushton, 2010). The main benefit of logistics is to efficiently and cost-effectively meet client demands. Basic customer service training focuses on operational logistics and making sure the company can provide its customers with the seven rights: the right amount of the

right product at the right time at the right place in the right condition at the right price with the right level of service. Bowersox et al. (2002) assert that any delivery site is a customer in the eyes of a logistician. Consumers' residences, retail and wholesale establishments, as well as the loading docks of manufacturing facilities and distribution centers, are among the typical destinations. Sometimes the recipient of the good or service is a separate business or person who assumes ownership of it. Many other times, the client is a different location of the same company or a business associate further along the supply chain.

Christopher (2011) says that regular delivery of time and location utility may be characterized as customer service. In other words, items don't have value until the customer has them in their possession at the appropriate time and location. Customer service has undoubtedly many facets, from on-time delivery to after-sales support. Consumer service should essentially boost "value-in-use," which means that the product gains value in the eyes of the consumer since the service benefits the core product. Companies that place a high premium on logistics management are often those who have been able to distinguish themselves from the competition and receive recognized for service excellence (Christopher, 2011).

Goods availability, lead times for obtaining the goods, the product's quality upon receipt, and order accuracy are all examples of customer services in logistics (Reddy and Jayam, 2016). Selling a product in today's global market might sometimes be simpler than getting it in front of customers. In order to make their goods and services available to customers in the best assortments, at the best times, and in the best locations, businesses must determine the best ways to handle, store, and move their goods. Effective logistics and physical distribution will have a big impact on costs for the business as well as customer pleasure. An otherwise successful marketing campaign can be ruined by a subpar distribution infrastructure (Kotler et al., 2005).

Studying the service requirements of the target market is the first step in developing a marketing logistics system. According to some businesses, their logistics goal is to provide the best customer service at the lowest possible price. Sadly, there isn't a logistics solution that can optimize customer service while reducing distribution expenses. Maximum customer service necessitates quick shipping, substantial inventory, changeable assortments, lax return policies, and a plethora of other services, all of which drive up the cost of distribution. Minimum

distribution costs, on the other hand, imply slower shipping, smaller inventory, and larger shipping lots, all of which indicate a lesser quality of general customer service. According to Kotler et al. (2005), the marketing logistics system should aim to deliver a targeted level of customer service at the lowest possible price.

2.3.2. Warehouse Management Practices

Every logistics system must include warehousing. According to Meng (2006), warehousing is a component of a company's logistics system that keeps things (raw materials, parts, commodities in process, and finished goods) at and between the points of origin and consumption of the goods being stored. Although the phrases are occasionally used interchangeably, distribution centers and DCs are not the same. The broader phrase is warehouse. An efficient supply chain management strategy must include a warehouse management system since it is essential to maintaining high standards of customer service and effective logistical operations. Choosing the most cost-effective warehouse site that will allow for simple access by both its customers and suppliers is a key component of warehouse management. Additionally, it entails preparation for methods for managing the cycle lead-time flow for items in the warehouse and for facilitating easy material flow in the warehouse (Goksoy, 2013). Demand changes quickly, but supply changes more slowly, which makes managing a supply chain difficult. When demand changes, warehouses enable us to react rapidly (Bartholdi and Hackman, 2014).

Since the cycles of production and consumption are rarely synchronized, a storage function is required. Differences in required amounts and timing are overcome by the storing function (Kotler et al., 2005). High production rates and efficient warehouse management provide the impression that the company appreciates its consumers because if the warehouse is operated inefficiently and productivity is low, the company may be delivering the wrong message to its clients. The level of customer satisfaction may suffer as a result of ineffective warehouse management due to shipping delays, processing mistakes, and other complications (Bagshaw, 2017).Through effective time and space management, warehousing offers time and place usefulness for any product (Ackerman, 1997).overcoming the issue of offering clients an expanding range of products and The emphasis of warehousing has changed from passive storage to strategically placed warehouses offering prompt and cost-effective inventory

replenishment for customers in order to reduce holding times of materials and parts (Faber, 2015).

Four different material flows are conceivable in a warehouse, according to Tsige (2013). The first flow is the cross-docking activity, in which goods are either transported straight to the shipping area or temporarily kept in a staging area. The second flow occurs when order picking activities are carried out and products are significantly more frequently stored in the reserve area. The third flow occurs when merchandise is initially kept in the reserve region and then transferred to the forward area. The fourth type of flow involves the immediate movement of received goods into the forward area in order to complete the corresponding order consolidation (Tsige, 2013).

2.3.3. Inventory Management Practices

The stock of any resource or object used by an organization is known as its inventory. According to Augustine and Agu (2013), an inventory system is a set of policies and controls that monitors inventory levels and decides what levels should be maintained, when stock needs to be refilled, and how big orders should be. Inventories, in the opinion of Babatunde & Arogundade (2008), are the lifeblood of any industrial business. They are the inventory of things used in the manufacturing system, such as fundamental raw materials, supplies of parts or finished goods that are still under construction. It is crucial to properly coordinate production activities based on the anticipated demand, the inventory profile that is now available, the lead time, the available capacity, and other relevant factors (Bagshaw, 2017).

The fundamental goal of inventory management is to make sure businesses maintain inventories at the lowest feasible cost while still achieving the goal of making sure the business has enough supplies to support continuous operations (Mpwanya, 2005). The size and placement of stocked products are the main concerns of inventory management. In order to safeguard the regular and planned flow of production against the unforeseen disruption of running out of supplies, inventory management is necessary at several points across a facility or at many sites of a supply network. According to Agu Okoro Ag et al. (2016), the scope of inventory management also includes managing the lead time for replenishment, replenishment of goods, returns and defective goods, and forecasting demand, carrying costs of inventory, asset management,

physical inventory, space that can be used for it, demand forecasting, inventory valuation, inventory visibility, and future inventory price forecasting.

To cut expenses, boost service quality, increase product availability, and ultimately guarantee cu stomer pleasure, businesses are interested on inventory management (Thogori and Gathenya, 201 4).Maintaining the delicate balance between carrying too much goods and carrying too little is th e undamental challengeStock obsolescence and excessive inventory carrying costs are the results of carrying too much inventory.

If the company keeps too little inventory on hand, customers may be unable to purchase things. Stock outs result in expensive lastminute shipments or production, unhappy consumers, or lost sa les as unsatisfied customers migrate to a rival.Thus, in order to manage inventory, businesses mu st weigh the expenses of maintaining greater inventories against the revenue and profit they woul d generate (Kotler et al., 2005). For most businesses, whether they are large, medium-sized, or small, inventory management is a crucial management issue. One of the essential ingredients for success in supply chains is efficient inventory flow management. Maintaining a balance between inventory supply and demand is difficult when managing inventories.

According to Augustine and Agu (2013), is divided into three categories, including Inventory of raw materials includes everything an organization buys for processing as well as inventory of work-in-progress, which is the stage of raw materials that a facility is still in before moving on to the next step of processing. These are materials that have undergone partial processing but remain unfinished), and finished products inventory (stock of goods in the warehouse or awaiting shipping; the quantity of finished goods stock depends on coordination between the organization's production and sales divisions). Maintaining the appropriate level of inventory required to support the production system at all times and at the lowest cost is the primary goal of inventory management.

2.3.4. Transportation Management Practices

The term "transport" refers to a group of activities involved in the safe and efficient movement of people and products. Due to the transportation of commodities and the development of auxiliary services, it is crucial to logistics (Grabara et al., 2014). The most significant economic activity among the parts of commercial logistics systems is the transportation system. It offers the

outbound logistical link by moving and storing finished items to the customer and the physical link by moving and storing resources for manufacture (Sabry, 2015). From the time a product is manufactured until it is finally delivered to the desired location, transportation is a crucial operation in the logistics chain. Transportation provides the crucial service of connecting a business to its suppliers and customers by moving items from locations where they are sourced to locations where they are wanted (Reddy and Jayam, 2016).

Logistics' primary sub-function of transportation, which gives products their time and location utility, is transportation. The ability to achieve the well-known seven Rs—the right product, in the right quantity, in the right condition, at the right place, at the right time, for the right customer, at the right cost is, in fact, the foundation of the entire supply chain (Kumar and Shirisha, 2014). In order to convert resources into usable items for the final customer, a number of processes must occur, and transportation is one of them. The notion of business logistics is the structuring of all these tasks and sub-functions into a system of products movement in order to maximize service to the consumers while minimizing cost (Tseng et al., 2005). The topics of method of transportation, fleet size, route choice, vehicle scheduling, and freight consolidation are all covered under transportation management. Due to their economic interdependence, all four domains should be organized together to maximize benefits (Reddy and Jayam, 2016).

2.4.5. Information Flow Management

Practices Information flow, in accordance with Bowersox et al. (2002), identifies particular areas within a logistical system that have requirements. The three operational domains are also integrated via information. Different movement requirements in terms of order size, inventory availability, and urgency exist within various logistics regions. The main goal of information flow management is to balance these discrepancies in order to enhance supply chain performance overall. The need for knowledge must be emphasized in light of the fact that market distribution, manufacturing support, and procurement all involve actual activity. While the real logistical work is done in these areas, information helps to coordinate planning and monitor daily operations. The logistics system's effort may be ineffective without reliable information.

Azevedo et al. (2007).These elements, in turn, offer the chance for businesses to become more competitive. The smooth and swift flow of information is a key component of effective logistics

management in the organization since it gives managers access to full knowledge (Grunt and Nowakowska, 2007).All aspects of the logistics sector, including transportation, warehousing, order processing, materials management, and procurement, use computers, the internet, and information communication technologies. By offering clients greater services, it can assist businesses in gaining a competitive edge (Adebambo and Toyin, 2011).

From a logistical standpoint, channel effectiveness is strongly related to information flows like client orders, billing, inventory levels, and even customer data. There are numerous ways to transmit and manage information, such through salesmen, the telephone or postal service, the Internet, or electronic data interchange (EDI), which is the computerized transmission of data between businesses (Kotler et al., 2005).

2.5.6. Supply Management Practices

To ensure that the company's manufacturing and marketing activities are working effectively, procurement entails the acquisition of commodities, services, and information (Pienaar, 2010). A producer, a wholesaler, or a retailer will use procurement to purchase goods from outside vendors to support their business (Meng, 2006). One of the essential connections in the supply chain, purchasing and supply, often known as procurement, can have a substantial impact on the organization's overall success. It goes without saying that the success of any manufacturing facility depends on the availability of adequate supply of raw materials at the appropriate price, of the requisite quality, in the appropriate location, and at the appropriate time (Rushton, 2010). A new viewpoint of procurement's function in supply chain management has been sparked by the shifting emphasis on it as a critical competence in enterprises.

Making sure that the company is in a position to implement its manufacturing and marketing plans with support from its supply base has taken precedence over confrontational, transaction-focused negotiation with suppliers. Supply assurance, inventory minimization, quality improvement, supplier development, and lowest total cost of ownership are given a lot of attention in particular (Bowersox et al., 2002). The procurement function entails choosing resources and suppliers, deciding how inputs will be acquired, planning the timing and coordination of incoming items' arrival, negotiating prices, and inspecting incoming goods for quality (Pienaar, 2010).

2.2.3. Theory of Distribution Channel

Distribution, often known as place, is typically the fourth component of the marketing mix after product, price, and promotion. The intermediary businesses or channels that a product travels through before being used or consumed are known as distribution channels. These businesses typically specialize in marketing or sales and rely on economies of scale to be successful. Manufacturers have different methods for distributing their goods to customers depending on whether they are producing industrial or consumer goods. Some of them distribute heavily (via numerous middlemen) or only (straight to the consumer).

According to Bucklin (1966), the purpose of distribution is to enable businesses to complete the task of distributing goods at the proper time, location, and quantity for the lowest possible price. Although the distribution problem was one of the first problems examined by marketing researchers at the start of the 20th century (Bartels, 1965), it still holds a significant place in managerial situations and marketing literature today. The two orientations of channel theory are economic and behavioral, according to Stern and Reve (1980). Analyze the effectiveness of the channel first, looking at things like channel structure and design. The latter is sociologically oriented, focused on conflict in channels, power, A series of tactical choices are necessary for channel structure (Iyanda, 1990):

The first choice is which type of intermediary is most suited, such as a wholesaler, retailer, franchise, broker, or direct sales force. The second factor is distribution intensity, or how many intermediaries and tiers of a channel system to include. Distribution intensity, the second strategic choice in a channel, is a crucial component of the channel strategy (Iyanda, 1990), and it frequently determines the channel structure, determining the kind of intermediary, the market coverage, and the style of distribution (direct or indirect).

A variety of approaches has been taken to distribution channel, but distribution structure and intensity has received little attention in academic research (Iyanda,.1991; Rogers, 1983); Marketing researchers are more concerned about management issues like power, conflict, satisfaction and performance (Gaski, 1996). Stern and El-Ansary (1982) affirmed that a channel is not easily selected; there are some constraints such as the availability of good intermediaries, traditional channel patterns, product characteristics, company finances, competitive strategies,

and customer dispersion question Mcvey (1960) expressed the same idea when he stated that channels networks were not necessarily designed under the control of one type of organization and that they faced limited choices in designing the channels for their products. He added that choice of a channel is not open to any firm unless it has considerable freedom of action in matters of marketing policy. According to this approach, the producer has a variety of limitations, including limited choice of types of intermediaries, customers and locations of trading areas.

The channel option, according to certain logistics authors, is a cost and financial choice. To this purpose, Lilienetet al. (1992) stated that the choice of channel depends not only on economic factors but also on the channels' control and adaptability. Current articles on channels, according to Wilkinson (2001), do not explain how a particular channel structure came to be or how it would develop over time. According to Baligh and Richartz (1966), the theory's basic presumptions fit under the economic approach. The channel design publications do not yet know if a company can choose at its discretion or must comply with a specific channel structure. The producer's creativity will determine this choice (Wilkinson, 2001). Therefore, the question arises: Can businesses pick their channel structure, or must they merely react to it? What elements influence the decision to follow a channel's structure?

Therefore, the question arises: Can businesses pick their channel structure, or must they merely react to it? What criteria are used to choose a channel? The main theoretical tenet establishes a relationship between product class and distribution structure (Frazier and Lassar, 1996). The category of commodities is connected to the Copeland (1923) classification of consumer goods (convenience, shopping, and specialized). His goal was to produce a manual that manufacturers could use to construct their marketing strategies. His goal was to demonstrate how consumer purchasing patterns influenced the kind of distribution channel and marketing approach (Bucklin, 1962). He claims that the distribution of convenience products, shopping products, and specialized products are all related to intensive distribution, selective distribution, and exclusive distribution, respectively. Consumer goods and services that are regularly purchased, readily available, and require little effort to compare are known as convenience goods. Consumers spend a lot of time and effort researching and comparing different brands because they don't buy shopping merchandise as frequently. According to Kotler (1997), specialty items are consumer

goods that have features or brand recognition for which a sizable segment of purchasers is willing to make an extra effort to make a purchase.

2.2.4. Overview of Pharmaceutical outbound

Several parties are involved in the outbound of pharmaceutical products, which is a crucial supply chain activity. Purchasing, keeping, supplying, importing, and exporting pharmaceutical products are all included. In both the public and private sectors, pharmaceutical items may be supplied by manufacturer; importers, wholesalers/distributors, retailers, and other authorized individuals (NAFDAC, 2016). Pharmaceutical distribution, according to WHO (2010), includes obtaining, buying, keeping, selling, supplying, importing, exporting, or moving pharmaceutical products with the exception of dispensing or giving pharmaceuticals directly to patients or their representatives.

key objective of pharmaceutical outbound logistic management is to maintain a consistent flow of medicines and supplies to the facilities where they are required while ensuring that resources are being used as efficiently as possible. In order to ensure the timely delivery of high-quality medications all the time at medical institutions, adequate and dedicated transportation facilities combined with cold chain maintenance are crucial (Iqbal, 2017).

In the pharmaceuticals outbound logistic system there are two main approaches that is pull or push system are used to distribute stock from the higher level store to a lower level store or health facility. In a push system, the central medical store (CMS) or the regional or district store determines what quantities of medicines are to be issued to each lower level store or the health facility, based on centrally estimated allocation quantities. In a pull system, each health facility determines the medicines requirements tobuy from the higher-level warehouse. Pull system use local information about demand, which often does not reach the CMS and depends on good decision-making ability and accountability at the decentralized level. A push system is robust to weak order and stock management capabilities at the lowest level of the distribution system (Yadav *et al*., 2011).

Pharmaceutical outbound has never been only about delivery. It involves safely and effectively delivering the appropriate medications to the appropriate patients at the appropriate times. It

manages a complicated supply chain on a daily basis, acting as a crucial link in the healthcare system and distributing medications effectively, safely, and securely. To keep the shelves of pharmacies, hospitals, long-term care homes, clinics, and other health care providers stocked with the supplies patients require, distributors operate around the clock. Electronic identification, bar coding, usage-related data, and other information technologies have all been used to speed up the outbound of medications along the supply chain (Belson, 2005).

2.2.5. Effective Pharmaceutical Outbound Logistics Management

The WHO stated in its report on "Good Distribution Practices for Pharmaceutical Products" (2010) that the integrated supply-chain management of the products includes pharmaceutical distribution as a key activity. Different personnel at separate organizations handle the various logistics components of the delivery of medications. Generally speaking, various entities, institutions, or persons throughout the chain are in charge of storing, picking and packing, labeling, preserving records and paperwork, and using transportation procedures. It is strongly advised that these varied participants be effectively integrated into their respective distribution roles. If distribution networks are interrupted, dangers including adulteration, mix-ups, contamination, and cross-contamination that are present in the manufacturing environment are likely to be present as well. The public's health and safety are seriously endangered by the resulting counterfeit pharmaceutical items. Weak distribution networks for pharmaceutical products give counterfeit, illegally imported, stolen, and inferior medications a way into the supply chain, both in developing and wealthy nations.

According to Johnson (2018), there are five main problems with pharmaceutical logistics that cost the pharmaceutical industry a lot of money: reliance on human resources, product damage, hygienic conditions, temperature management, and avoiding shortages. The majorities of tasks in the pharmaceutical industry require human interaction rather than automated systems. Pharmaceuticals require extra care during storage and shipping since they are susceptible to damage. Additionally, they require an environment free of bugs, germs, and other biological contaminants. Controlling the temperature is another significant problem in the logistics of medications due to their sensitivity. One of the difficulties in the supply chain for pharmaceuticals is meeting client demand. Because of their price, theft, damage, contamination,

and difficulties complying with rules, the sector is unable to maintain a balance between demand and supply.

Due to shipping delays, pharmaceutical medicines worth billions of dollars are either transported or stored at the wrong temperatures or arrive at their destinations after their shelf lives have passed. In addition to rendering the products useless, such circumstances render the products extremely dangerous and potentially lethal to the users. At times, it appears as though pharmaceutical firms and other industry players are unaware of or unconcerned about this issue. However, it goes beyond that because, due to the complexity of the business settings, pharmaceutical industry stakeholders have significant difficulties when implementing good distribution procedures. There are numerous tasks, including product sorting, packing, lifting, moving, loading, and delivery, where human error is possible. Preventing and treating such illnesses is expensive. Additionally, the business environment is made difficult by the complex government laws and other rules in the pharmaceutical industry. Pharmaceuticals can be damaged by improper handling during packaging, storage, and transportation, costing businesses money and putting society at risk of illness. However, therapeutics research and technologies like improvements in packaging, monitoring, and tracking, upgrades in warehousing, shipping, and transportation, advancements in educational and training programs, and policy and regulatory are, if used properly, alleviating these issues (Claire Sykes, 2018).

In an investigation into the major difficulties facing the pharmaceutical supply chain, Christian L. Rossetti et al. (2011) found that the structures of the pharmaceutical supply chain require fundamental changes. This is primarily a result of the business's poor networks. Particularly in developing countries, the delivery of the products to the final consumer is inefficient and not proceeding as planned. Given how heavily regulated pharmaceuticals are as a class of goods, the regulatory burden has a significant effect on the business as well. To guarantee the products are delivered safely, operating plans, inventory regulations, supply chain visibility, and targeted service standards must be modified over time. The transport of pharmaceuticals from the point of creation to the final consumer requires excellent integrity and the combined impacts of all stakeholders.

Because pharmaceutical item are so heavily controlled, pharmaceutical companies should be careful when transporting, especially when it comes to products that are temperature-sensitive. Consumers will ultimately profit from safer transports, but this development places higher investment expectations on the pharmaceutical industry because they will need to demonstrate the caliber and safety of their transport from beginning to end. The pharmaceutical business has numerous issues when it comes to quality management of cold chain logistics Pharmaceuticals face a variety of real transportation challenges, such as: a lack of Good Distribution Practices for the cold chain, a lack of more precise guidelines, an internal audit plan that places more emphasis on logistics, the effects of unforeseen consequences, the need for product stability data, the need for a stricter validation of shipment solution, and the need for detailed data necessary for operational excellence. 2019 (Dan Arkwell)

The most difficult problems for the transportation of pharmaceuticals are the remarkable opposition to the implementation of international pharmaceutical criteria for quality standards in emerging governments and in regulatory infrastructure. In many developing nations, the availability of skilled workers to handle medications is still restricted. Leaders in developing international standards do not seem to have influenced their neighbors' development of local norms. Global standard-setters like the United States and the European Union seem to have remarkably little influence on standard setting, in contrast to classic conceptions of international norms diffusion (Anthony, 2016).Internal and external politics, economic reasons, climate, religion, and infrastructure are the problems and limitations in pharmaceutical transportation, and they will require coordinated global effort, investment, and time to resolve. The provision of the appropriate drugs to the appropriate people at the appropriate time and at the appropriate price presents significant transportation and supply chain management challenges (A. Moosivand et al., 2019).

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Temperature regulation is not the only aspect of product packaging that needs regulation. Logistics for the safe delivery of temperature-controlled goods benefit from the labeling and packing of the goods. (2013) (A. Mojzes et al.) For a variety of reasons, transporting pharmaceuticals one of the outbound logistic functions is more difficult than producing them. (2018) Megan R. Nichols

According to Pfeffer and Salancik (1978), organizational effectiveness is an objective measure of "how well an organization is meeting the demands of the various groups and organizations that are concerned with its activities." For a pharmaceutical distributor, it is crucial to evaluate potential improvements to outbound logistics performance. (Lezama 2015).

For any organization to be effective, in the pharmaceutical sector there should be effective distribution management process to convey finished products from the manufacturer to the final consumers. This is because without distribution, the best product will not be deliver and the marketing mix will break down and fail (Yeboah*et al.*, 2013). A well-established drug supply management facilitates the best use of financial & human resources, develops the essence of essential drugs, assures the continuous supply of affordable drugs, promotes the rational use of drugs and in general improves the quality of the health care system and access to essential medicines (Getachew, 2009).

In order to manage medicine distribution in an appropriate manner, there is a necessity of deep understanding of its management. (Kumar and Jha, 2015).

2.2.6. Pharmaceuticals Logistics and Supply Chain in Ethiopia

A number of issues plagued the nation's pharmaceutical distribution management system, including lack of supply, shoddy shipping, high cost, and inadequate storage. Drug shortages occur frequently in public health facilities. According to a national assessment, only 70% of the most important needed medications were accessible in the public sector (FMoH, 2003). Patients are forced to use the private sector when there are no medications available in the public sector. As a result, medications may account for more than half of the true cost of a visit, raising the likelihood of experiencing catastrophic health costs and the ensuing danger of becoming impoverished (Russell & Abdella, 2002).

In order to address these issues, the Ethiopian Pharmaceuticals Supply Agency (EPSA) was founded in 2007 by Proclamation No. 553/2007. The Agency has a duty to provide all public health facilities with sustainable, high-quality medications and to ensure their wise usage. Through the selling of medications with a markup, these funds seek to augment facility resources by raising extra money for the purchase of new medications and quality enhancements. The policy intends to increase the public's access to affordable and sustainable medicines, boost the general caliber of services delivered, and support the sustainability of health services (EPSA, 2014).

Commodities are delivered to facilities in the Ethiopian supply chain utilizing a variety of ways. All hospitals and accessible health centers have received program goods directly from EPSA since March 2012. As a temporary measure, Woreda or the zonal health offices (to whom EPSA deliveries) are providing products to the remaining health facilities. Health establishments are expected to pick up their acquired RDF goods from higher levels or vendors using their own vehicle or other means of transportation. Every month, health posts are expected to pick up their supplies from their resupply health center. The National Survey of the Integrated Pharmaceutical Logistics System in Ethiopia was published in 2015.

An automated health commodities management information system (HCMIS) was established in 2009 as part of the USAID-funded DELIVER project. HCMIS can greatly enhance the capacity of healthcare facilities to manage supplies in their stores. Health care facilities may handle all EDs as well as medical and laboratory supplies with the help of the HCMIS, a locally created, user-friendly software program. Store managers, pharmacists, and facility leaders can access a number of commodities reports that the HCMIS generates automatically. It also maintains inventory. As of 2011, the initiative had put the system into place in 205 particular health facilities across Ethiopia (John Snow/DELIVER, 2011).

To enhance forecasting and quantification of pharmaceuticals, the LMIS will be enhanced and connected with the HMIS and stock management of healthcare institutions. To continuously increase the effectiveness of supply chain management, operational research is regularly undertaken. The judicious use of medications will be improved with the help of patients and healthcare professionals. According to a national study conducted in Ethiopia, there are product

shortages at the central level, excessive inventories of certain products, and poor order fill rates for health institutions (Shewarega et al., 2015).

2.2.7. Factors Affecting Outbound Logistic Effectiveness

Here are a few elements that can affect how well a distribution system performs.

A. Financial Capacity and Outbound Logistics Performance

Johnson (2006) asserts that the effectiveness of a distribution function in the public sector is significantly influenced by the capability and management of the finance function. To guarantee sound financial management, appropriate and robust financial controls must be maintained. A structure must be in place to protect the assets of the program I, and there must also be the ability to create consistent and reliable financial statements. In this aspect, computerized financial solutions like Quick Books and Business Vision Software can be helpful. The flow of cash is a crucial component of financial capacity that is pertinent to distribution networks. This has to do with the promptness with which money are received in order to satisfy various requirements in distribution operations.

The distribution process is an expensive one that calls for cautious money management. To ensure continuous performance, fleet maintenance, dispatch staff compensation, and other costs should be carefully managed (Stern and Heskett, 1969). Cooper (2006) contends that if an organization faces financial difficulties, there can never be an effective distribution. Finances are used to update the fleet, pay the drivers, purchase enough inventory for distribution, and, most significantly, to set up and maintain a reliable information system.

B. Transport Outsourcing and Outbound Logistics Performance

Contracting out internal corporate operations to external (local or offshore) providers is known as outsourcing or the "make-or-buy" decision. With the rise of global rivalry in recent years, outsourcing has gained popularity and few corporate operations remain without being entirely or partially outsourced. Cost-cutting and output-boosting strategies such as outsourcing have been used in the past (Quelin & Duhamel, 2003; Johnson, 2006).

Wick (2000) asserts that the success or failure of a distribution strategy depends on the care and caution with which this function is continuously managed to ensure that distribution partners are doing their duties as intended. Wick issues a warning that outsourcing is not a cure-all; if the third-party distributor's practices and performance are not closely supervised, there is a risk of permanently losing the existing clients, who have been drawn in via much laborious effort. According to Johnson (2006), understanding the process, defining the goals, establishing internal procedures for assessing performance against the goals, and implementing systems that aid in efficient function management are all essential for a successful outsourcing relationship.

C. Information Systems and Outbound Logistics Performance

Utilizing information systems to manage distribution improves value chains' predictability, efficiency, and waste reduction, which benefits all market participants (Ceva, 2010).If used properly, information system tools like radio, cameras, GIS, cameras, cell phones, and internet services have the potential to increase efficiency in the following distribution tasks: record keeping, monitoring field agent activities, procurement operations, credit and payment tasks, input distribution, measuring productivity, and forecasting (Cooper, 20). Customers utilize a variety of management information systems (MIS), ranging from straightforward spreadsheets to sophisticated software, to keep track of resources and streamline information flow. They are employing mobile phone-based systems more frequently. For the "channel" to contact the suppliers or their own field representatives, they are employing mobile phone-based solutions (Cooper, 2006).

Information technology can also be quite useful for vehicle routing. Vehicle routing is a flexible technique that can be used in a variety of contexts. It typically involves dispatching repair specialists, moving shipments of freight, and moving passengers. The goal of vehicle routing is to efficiently and effectively allocate transportation resources. The work of creating an optimum routing plan might be challenging given the large number of consumers, the variety of route alternatives, and the finite number of vehicles. In the majority of businesses, vehicle routing is handled by a dispatcher or dispatchers, who have extensive local expertise. To move the flow of resources as they are transported on trucks, however, as routing grows more complex; software programs can be utilized to assist the transport manager or the supply chain management (USAID, 2008).

D. Donors and Government Relationship

Working on political-economic issues seems to be hampered by cooperation strategies. First, many donors have a somewhat formal conception of what it means to collaborate with the government; this has the result that even when there is a strong grasp of the political-economic concerns, it is not seen proper to act on that understanding. Second, the current model of the health partnership in both nations spends a lot of time in formal meetings, leaving little time for issue-based networking and formulating influencing tactics (Kent Buse and David Booth with Grace Murindwa, Aziza Mwisongo, and Andrew Harmer, March 2008).

2.2.8. Measurements of Distribution Effectiveness

Distribution is the process of moving and storing a product through the supply chain from the supplier stage to the customer stage. Every pair of stages in the supply chain have distribution in between them. According to Neely et al. (1995), performance measurement is the process of calculating how effective and efficient an action is. Additionally, performance measurement offers a method for determining the effectiveness and prospective management techniques, as well as for facilitating the comprehension of the circumstance.

Many businesses have struggled to fully realize the potential of their supply networks because they frequently did not create the performance metrics and measures required to integrate their supply chain to enhance effectiveness and efficiency. The discrete sites in a supply chain do not improve efficiency if each pursues goals separately, according to Lee and Billington's observation in 1992. Delivery schedules from the Distribution Company, necessary quantities, pharmaceutical product quality, and distribution costs can all be used to gauge how well a distribution strategy is working.

A. Delivery Schedules

Speed and reliability are the two primary qualities of delivery performance. Delivery speed is the period of time between receiving an order and making the actual delivery. When only some or even none of the competition can reach a stipulated delivery date, a company with superior delivery speed can "deliver more quickly than its competitors." The order input process is typically streamlined, inventory is held at strategic locations in the supply chain (such as local

warehouses or retail locations), surplus capacity is maintained to accommodate "rush orders," and speedier transportation is used. Delivery dependability is the capacity to provide goods or services on schedule. Long lead times are acceptable for a company as long as it can still deliver goods reliably. The percentage of orders that are delivered by the scheduled time and the average delay of late orders are common indicators of delivery reliability. Delivery dependability is crucial for businesses involved in a supply chain, according to Mohanty and Deshmukh (2006). As a result, it is essential that the performance measurements employed be designed to act as integrating instruments for promoting long-term, continuous improvement throughout and within the various supply chain phases. Cooperation across the many coalitions found within the supply chain structure will unquestionably be hampered by aspects of supply chain operation that are not evaluated in easily understood performance indicators, such as cost.

B. Quality of products

Here, we can see the pharmaceutical items' quality in terms of their expiration date and whether or not they contain the suitable chemical in the required dosage for the appropriate ailment. On quality as a performance measure in supply chains, there is a lot of published research. In 1999, Beamon. The benchmark for a product is its quality, which is correlated with its level of consumer satisfaction or suitability for usage. Juran (1978). The term "quality" in manufacturing or service typically refers to compliance with established product specifications (Schniederjans 1997). Any deliveries that are delayed may be seen negatively by the customers. Quality therefore pertains to both a product and the services offered. Therefore, all of the outcomes that lead to consumer pleasure are crucial. High customer satisfaction is crucial since it is a crucial sign of success. Chan (2003).

Stewart (1995) and Gunasekaran et al. (2004) claim that a decrease in lead-time attributes can lead to an improvement in delivery performance. On-time delivery is a crucial component of delivery performance. Delivery on time indicates if a perfect delivery occurred or not and is a gauge of the quality of the customer experience. Christopher (1994) used a similar phrase, "on time order fill," and defined it as a combination of "delivery reliability" and "order completeness." The percentage of finished items in transit is another component of delivery; if it is high, it indicates that inventory turns are low, which results in unnecessarily higher levels of capital that is held up. Delivery speed can be affected by a number of variables, including vehicle

speed, driver dependability, frequency of delivery, and depot location. Inventory levels may drop as a result of improved efficiency in various areas (Novich, 1990).

C. Quantity Required

Product and distribution planning is a logistical activity that addresses group amounts of goods and covers when and where they should be made and distributed, or it is a single choice regarding when, where, and how much manufacturing should occur (Ballaou, 1978). At the product and distribution stages separately, production and distribution schedule could maximize revenue and source usage. Typically, the cost of the delivery consignment is made up of a fixed cost and a variable cost that is proportional to the overall distance of the route taken. For instance, the total distribution cost depends on the quantity of shipments used and the precise routes taken. Therefore, more delivery shipments would need to be used in order to achieve shorter lead times, which would result in greater distribution costs.

D. Distribution Cost

The cost of an organization's operations has a direct impact on its profit. Many people are aware of its significance and impact on the entire performance as a result. In fact, Chan (2003) argues that it is the most important direct type of assessment. The sum of all its intricate qualities is the total cost. Each attribute's contribution may differ for various sectors. A delivery service should make sure to deliver its goods as quickly as possible. Some people might believe that distribution and inventory costs should account for the majority of cost, but since commodities are typically maintained for a long time, a significant contribution from inventory costs may really be a sign of poor performance. Each sub cost contribution to performance should be thoroughly investigated by a management. In addition to the domestic supply chain, there is also an international supply chain, which may involve significant temporal and physical distances. A global supply chain may be complicated by a number of national marketplaces, which raises costs overall and, in particular, incentive costs, subsidies, and the sensitivity to long-term expenses. Continuous improvement initiatives for the entire supply chain must be combined with the adoption of performance measures that truly reflect the chain as a whole and that concentrate on measuring performance in terms of cost and uncertainty. According to Walker and Alber

(1999), supply chain performance indicators are still rigorously defined in terms that not only maximize local operations but also recognize and reward individual success.

2.3. Empirical Literature Review

2.3.1. The Global Evidence

The availability and cost of medications in the public and private sectors are important determinants of access to care, according to the world health organization's (WHO) 2011 Medicines and Health Report. Using a consistent approach, surveys of the availability and price of medications have revealed that a major obstacle to accessing medications is a lack of availability of medications, particularly in the public sector. Generic medications are less than 60% available in the public sector overall, ranging from 32% in the Eastern Mediterranean Region to 58% in the European Region. Patients are frequently compelled to buy medications in the private sector due to the inadequate supply of medications in the public sector.

High inventory and storage costs as well as dispersed organizational responsibilities were found in a study undertaken by Targeting to highlight the most recent advances in the drug distribution procedures used by hospitals and other healthcare facilities. According to this study, health institutions can cut their overall expenditures by up to 7% by managing their storage and inventory care costs, which is quite significant in the hospital market. The study also shown that hospitals can enhance patient care quality while reducing costs by using a unit dose approach, that minimizes inventory holding. Roberta Pinna et al.(2015)

Pharmaceutical logistics is special and requires optimizing effectiveness rather than efficiency because the final customers are in charge of caring for the lives of their patients. After staff costs, it is the second most expensive part of healthcare. Non-Cold Chain Logistics and Cold Chain Logistics are included in its classification, with proportions of 93.5% and 6.5%, respectively. Ground transportation, followed by shipping and air transportation, is the most typical means of transportation for pharmaceutical logistics. In 2016, the market for ground transportation accounted for roughly 45.1% of all transportation. According to this study, Chemical Pharmaceuticals, which accounted for around 67.6% of all pharmaceutical classes in 2016, had the most expensive pharmaceutical logistics (Pranali Choudhari, 2019).

Effective outbound logistics are important in the pharmaceutical sector for both product deliveries and lowering operating costs. Drugs that are operated over an extended period of time suffer damage and waste. Cross-dock operations cut the overall cost of operation in their outbound logistics by 19%, according to a study on the improvement of intravenous fluid delivery times. One of the current key concerns in healthcare is the cost of the pharmaceutical supply chain caused by drug waste. In addition to being a big financial success, it also contributes to timely delivery and better inpatient treatment. (2018) (Isasan T. et al.

According to a study by N. Pagliarulo et al. (2018), the pharmaceutical supply chain business has a number of major obstacles, including a lack of visibility that is the root cause of many issues leading to medicine shortages and fake medications. Critical ingredients are lost during shipment as a result of inadequate temperature management.

Johnson (2006) discovered that the management and capacity of the finance function have a significant impact on the performance of the distribution function in the public sector in his study titled "The Influence of Financial Capacity on the Outbound Logistics Performance in the Public Sector." To guarantee sound financial management, appropriate and robust financial controls must be maintained. Additionally, there must be the ability to create consistent financial reports with a framework in place to protect programmed assets. The flow of cash is a crucial component of financial capacity that is pertinent to distribution networks. This has to do with the promptness with which money are received in order to satisfy various requirements in distribution operations.

Additionally, Wick (2000) in his study titled "The Impact of Transport Outsourcing in the Outbound Logistics Performance in Business Outside Suppliers" indicated that success or failure in outbound depends on care and caution in continuous management of the outsourcing function to ensure that the job is being done by distribution partners as expected. The third-party distributor runs the danger of permanently alienating the current clients it has worked so hard to win over if its operations and performance are not closely watched. Wick notes that understanding the process, defining objectives, developing internal procedures for assessing performance versus objectives, and implementing systems that aid in effective function management are all essential for a successful outsourcing relationship.

On top of that, Ceva(2010) found that using an information system to manage supply increases efficiency, predictability, and reduces waste in value chains, which benefits all market participants. The study was titled "Effect of Information System in Performance of Distribution of All Markets." A wide variety of digital devices and related tools, including radio, internet, and cell phone services, are examples of information system tools. Additionally, Cadotte and Stern (1979) found that the importance of forming partnerships between donor and government lies in enhancing service delivery in their study titled "The Effect of Building Partnerships Between Donor and Government in the Outbound Logistics Performance" (Cadotte and Stern, 1979). Together, the donors and the host government can set a common objective that will serve as a guide for coordinating the use of the resources that are available to move toward the objective. This expressly encourages donors to step up their efforts to work with the government to distribute humanitarian aid to various populations.

2.3.2. Empirical Evidences from Ethiopian Context

According to Dessalegn (2015) study result, the data visibility at EPSA is poor coordination, lack of accountability and lack of data management and dissemination skills. As a result, stock on hand, procurement and pipeline information, and stock out notifications were not organized and shared to both FMOH and stakeholders on regularly bases. The data visibility concerns at health facility were mostly lack of accountability, poor adherence to schedule, and lack of completeness and quality of reports. Moreover, the study conducted on quality perspective of good distribution practices in Indian pharmaceutical industry showed that most of the quality of pharmaceutical products is affected at the time of distribution. According to the survey result, most of the time products are exposed to direct sun light during transportation and these are the cause of substantial generation of impurities as result of product degradation (Kumaar and Jha, 2015).

According to reports, the average availability of necessary medications in public and private health institutions in low-income nations is less than 57% and 65.1%, respectively. Compared to other private pharmacies in Ethiopia, hospital pharmacy offered a wider selection of medications. Due to availability, private pharmacies report stock outs more frequently than public ones. Although they are built in appropriate conditions, the majority of private pharmacies acquire a lot of products that are damaged or have expired since the nation lacks effective pharmaceutical reverse logistics systems (Ali Seid, 2017).

Only 65% of critical medications are readily available in Ethiopia, with a high rate of expiration (8.24%), limited patient knowledge of proper dosage (50.5%), and low satisfaction with pharmacy services (74.5%) (Mende Mensa et al., 2017).

Ethiopia spent 5.06% of its estimated $55 billion gross domestic product (GDP) on health, according to Dawit Teshome (2015). EPSA is in charge of the entire supply chain management of pharmaceuticals, including forecasting, procurement, custom clearing, storage, and distribution of pharmaceuticals. The agency provides both program items (such as contraceptives, test kits, vaccines, TB kits, ART, and anti-malarial drugs) and RDF i.

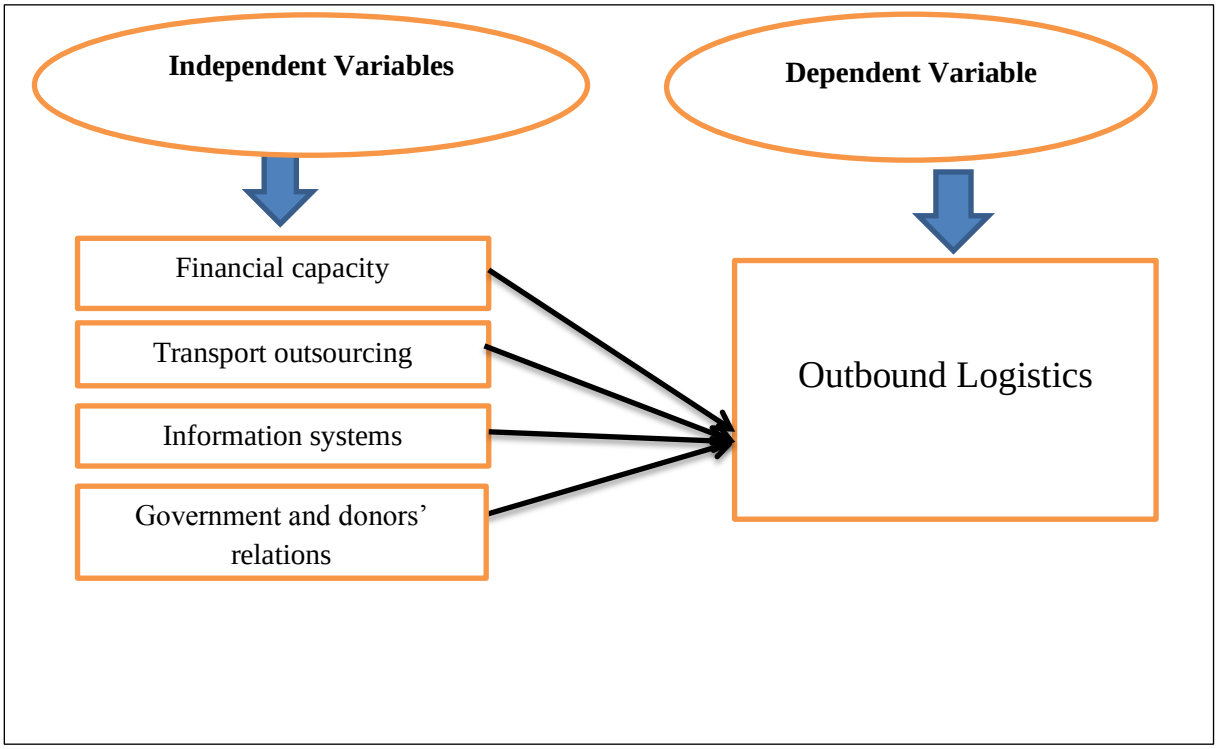
According to a 2012 study on factors affecting pharmaceutical Outbound Logistics Performance in Kenya's public sectors, financial capability is directly and favorably associated to Outbound Logistics Performance. According to the results, relationships with the government, relationships with donors, and outsourcing of the transport system, followed by information technology and financial capability, have a significant impact on Outbound Logistics Performance (Achuora et al., 2012).

2.4. Literature Gap

According to a 2012 study on factors affecting pharmaceutical Outbound Logistics Performance in Kenya's public sectors, financial capability is directly and favorably associated to Outbound Logistics Performance. According to the results, relationships with the government, relationships with donors, and outsourcing of the transport system, followed by information technology and financial capability, have a significant impact on Outbound Logistics Performance (Achuora et al., 2012).

2.5. Conceptual Framework

For the purposes of this study, the four constructs of financial capacity, transport outsourcing, information systems, and relationships with donors and the government are combined to represent the determinants of outward logistics. The conceptualization of the relationship between these constructs and outbound logistics is as follows:



Adopted from (Netsanet Getachew, 2018)

***Figure 01*: Factors affecting Pharmaceuticals Outbound Logistics Effectiveness**

2.5.1. Research Hypothesis

- Financial Capacity and outbound logistics

According to Johnson (2006), the capability and management of the finance department heavily influence the effectiveness of outbound logistics in the public sector. To ensure continuous performance, fleet maintenance, dispatch worker remuneration, and other costs should be properly managed (Stern and Heskett, 1969). Cooper (2006) contends that if an institution is struggling financially, there can never be an efficient distribution. Finances are used to update

the fleet, pay the drivers, purchase enough inventory for distribution, and, most significantly, to set up and maintain a reliable information system. In light of the discussion, the following theory is being tested:

H1: Financial Capacity has a significant positive impact on outbound logisticseffectiveness.

- Transport Outsourcing and Distribution Effectiveness

According to Wick (2000), Distribution's ability to succeed or fail depends on how carefully and continuously this function is managed to guarantee that distribution partners are doing their duties as planned. According to Johnson (2006), understanding the process, defining objectives, establishing internal procedures for assessing performance versus objectives, and implementing systems that aid in effective function management are all essential for a successful outsourcing relationship. As a result, the following testable hypothesis is developed:

H2: Transport outsourcing has a significant positive impact on outbound logisticseffectiveness.

- Information Systems and Distribution Effectiveness

Utilizing an information system to manage distribution improves predictability, efficiency, and waste in value chains, which benefits all market participants (Ceva, 2010). The following hypothesis is formulated to assess this function.

H3: Information system has a significant positive impact on outbound logisticseffectiveness.

- Relations with Government and Donors and Distribution Effectiveness

Utilizing an information system to manage distribution improves predictability, efficiency, and waste in value chains, which benefits all market participants (Ceva, 2010). The following hypothesis is formulated to assess this function.

H4: Relationship between government and donors has a significant positive impact on outbound logistics effectiveness

Chapter Three

3. Research Methodology

3.1. Introduction

The research methodology presented in this chapter includes a description of the study area, the selection of a specific research approach and design, population, the source and type of data, measurements and instruments, a description of the data collection process, ethical considerations, data analysis methods, and finally the validity and reliability tests.

3.2. Description of Study Area

The study areas concentrated on 11 local Addis Ababa pharmaceutical enterprises. The study is therefore bound and carried out in Addis Ababa. These 11 businesses are: East African Pharmaceuticals PLC, Addis Pharmaceutical Factory SC, Cadila Pharmaceuticals (Ethiopia) PLC, Ethiopia Pharmaceuticals Manufacturing SC, Fews Pharmaceuticals PLC, Julphar Pharmaceuticals PLC, Medsol Pharmaceuticals Manufacturing, Sansheng Pharmaceuticals PLC, Human Well Pharmaceutical Ethiopia PLC, Pharma cure PLC, and Sino-Ethiop Associate (Africa) PLC.

3.3. Research Approach

The research approach for this study is quantitative research approach. Quantitative research focuses on measuring and analysis in order to get results. It is also about the application and analysis of numerical data using specific statistical techniques to answer questions like who, how much, what, where, when and the like questions, Leedy&Ormrod (2001) quoted in Williams (2014). Quantitative research methods explain an issue or phenomenon through gathering data in mathematical form and analyzing in particular statistics (Aliaga & Gunderson, 2007). Moreover, According to Creswell (2007), quantitative research is a type of study in which the subject of the study is chosen, the research question is narrow and specific, the participants' responses are collected and analyzed using statistics, and the study is conducted impartially and objectively. Additionally, the quantitative approach used to facilitate the translation of gathered data into

statistical models for use in general analyses and the development of research topics based on the statistical models.

3.4. Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure and to address the objective. To obtain the necessary data the researcher employed a descriptive and explanatory research method, which sets out and examines what is it looks at the study area and explain the existing state of affairs.

A research design is the organization of parameters for data collection and analysis with the goal of balancing procedural economy with relevance to the research purpose and objective. As descriptive research is a sort of research that sets out and examines what is, it looks at the subject area and explains the current state of events, the researcher used this method to get the essential data.

3.5. Sampling Design of the Study

3.5.1. Target Population of the Study

Pharmaceutical manufacturing in Ethiopia began in 1964 as a joint venture between the Ethiopian government and the British-based Smith & Nephew Associate PLC with the Ethiopian Pharmaceutical Manufacturing Share Company. Currently, 11 (eleven) firms produce finished pharmaceuticals in Addis Ababa city administration which established before the year 2020 (listed in table 2). Thus, the target population of this study is senior employees of supply chain and marketing departments of selected pharmaceuticals manufacturing companies who have a direct exposure to the supply chain activity. The study also targets the customers of selected pharmaceuticals manufacturing companies who are wholesalers and pharmacists in public and private hospitals.

3.5.2. Unit of Analysis

The study unit analysis for this study are all employees of supply chain and marketing departments of selected pharmaceuticals manufacturing companies who have a direct exposure

to the supply chain activity and technical managers, store managers or any other assigned personnel of the selected pharmaceutical wholesaler that have an interaction with pharmaceutical SCM practices and strategies and pharmacists of hospitals.

Table 01: List of selected Pharmaceutical Industry Manufacturing Companies in Addis Ababa

Company	Year of establishment
Addis Pharmaceutical Factory SC	1997
Cadila Pharmaceuticals (Ethiopia) PLC	2003
East African Pharmaceuticals PLC	1996
Ethiopia Pharmaceuticals Manufacturing SC	1964
Fews Pharmaceuticals PLC	1996
Julphar Pharmaceuticals PLC	2013
Medsol Pharmaceuticals Manufacturing	1999
Sansheng Pharmaceuticals PLC	2018
Human Well Pharmaceutical Ethiopia PLC	2015
Pharmacure PLC	1998
Sino-Ethiop Associate (Africa) PLC	2001

3.5.3. Sample and Sampling Technique

- **Sampling Techniques in Selecting Respondents from Manufacturing Companies**

For selecting respondents from manufacturing companies, the researcher uses non-probability sampling technique and the selection of the respondents has determined by using purposive sampling method because not all departments found in the selected companies are concerned about SCM practices and strategies.

To discuss on different issues of SCM practices of the selected companies and to study about the suppliers of raw materials, questionnaires distributed to the purchasing division head (two respondents for each company); technical manager (1 for each company) and marketing and sales division head (two for each company). Since technical manager is involved in all technical

operation including production and sales, quality assurance research, development, engineering division, and marketing and sales division head for relationship with the customers. Thus, 5*11=55 respondents were selected from the eleven pharmaceutical manufacturing companies.

- **Sampling Techniques in Selecting Respondents from Distributors**

For selecting respondents from manufacturing companies, the researcher uses probability sampling technique (simple random sampling) and the selection of the respondents were determined by using simple random sampling method. The distributor of most products produced in selected finished pharmaceutical producers is EPSA mainly for public health facilities and different wholesalers for private health facilities. The study area is in Addis Ababa since most of the pharmaceuticals are consumed in Addis Ababa. Since majority of the firm's products are procured by EPSA, EPSA was selected for the study by purposive sampling, and private distributors (wholesalers) were selected using simple random sampling. According to the Regulatory activity update of EFDA, there are 680 licensed pharmaceutical wholesalers (customers) in Ethiopia of which 478 found in Addis Ababa (N=478) (EFDA, 2021). The target populations for the study are all finished pharmaceutical pharmaceuticals manufacturing established before the year 2020 and wholesalers having a valid license given by EFDA to operate in Ethiopia and interact with private pharmaceutical importers, which have their registered office and store in Addis Ababa, Ethiopia. At a confidence level of 95% the sample size for analysis of the wholesalers are 218 wholesalers. The sample size is determined by the statistical formula (Israel, 2009):

$$\mathbf{n = N/ (1 + N*e2) = 478/ (1 + 478* (0.05)2) = 478/2.195 = 218}$$

Where

- ☑ N: population,
- ☑ n: sample size and
- ☑ e: level of precision.

The 218 wholesalers have selected by random sampling techniques using their name alphabetically. Questionnaires has filled by technical manager of the wholesale organization, since the technical manager is responsible for managing all pharmaceutical activities and certified by the regulatory authority to manage the firm technically.

❖ **Sampling Techniques in Selecting Respondents from Retail Outlets**

For selecting respondents from retail outlets, the researcher had been used simple random sampling technique and the selection of the respondents were determined by using purposive sampling method. Since most of the pharmaceuticals of the city are consume by hospitals, the researcher has also included respondents from 20 federal and private hospital pharmacists in Addis Ababa as a sample to see the practices of supply chain of manufacturing company products. For those 20 public and private hospitals, there are pharmacy head that are pharmacists responsible for managing supply of pharmaceuticals have filled the questionnaire. Thus, 55+219+20= 294 respondents have been selected from pharmaceutical manufacturing companies; distributors (wholesales); Retail Outlets (public and private hospitals) respectively.

3.6. Data sources, Types and Demographic Information

3.6.1. Data Source and Types

Primary data was collected from employees of the case-manufacturing firms, in particular from distribution, supply chain, marketing departments, and plant managers of those firms. A self-administered questionnaire with closed-ended questions has been designed to collect responses from the employees. The study has used desk review of secondary documents, like policy and strategy documents, research, and other relevant materials.

The general objective of the current study was to examine factors affecting effectiveness of pharmaceutical outbound logistics: the case of some selected pharmaceutical manufacturers in Addis Ababa. To this end, quantitative study procedures with descriptive and inferential designs were followed, and 294 respondents selected from pharmaceutical manufacturing companies; distributors (wholesales); retail outlets (public and private hospitals) took part in this study through responding to items of the 5-points Likert type quantitative scales. The questionnaire responses of these study participants analyzed quantitatively using SPSS version 25.

All data sources were primary data, which were collected from individuals who directly involved in outbound logistics operation of pharmaceuticals. All information was gathered directly from people who were involved in the outward logistics of medications, making it primary data. The questioner used to collect the primary data is available in Appendix I.

3.6.2. Response Rate

In undertaking the survey, 294 questionnaires were distributed. From the distributed questionnaires, 278 respondents have properly filled and returned the questionnaires. The rest 16respondents failed to return the questionnaires. The response rate of the study, as indicated in table below, was 94.6. According to Yu & Cooper, (1983). 50% is a sufficient return or success rate, 60% is a decent response rate, and 70% or greater is a very good rate. The response rate is sufficient for analysis and reporting with great response rate, so this can move on to further in-depth analysis after it has reached more than 70%.

Table 02: Questionnaires Distributed, Returned and Unreturned

Questionnaire	**N**	**%**
Returned	278	94.6
Unreturned	16	5.4
Total Distributed	**294**	**100.00**

3.6.3. Demographic Information of Sample Respondents

As it is clearly shown in, the tables below, around 65.8 percent of the respondents were male and 34 percent were female. This indicates there was substantial representation from both sexes in this study. From table 4 it can also be deduced that large number of the respondents belong in the age group 21 to 35, which accounts for 47.5 percent of the total respondent. There were also relatively large numbers of respondents in the age groups 36-50, accounted for 27.5 percent. The smallest number of respondents was in the age group twenty and below which was 3.2 percent of the total respondents.

Table 03: Demographic Information of Respondents

VARIABLE		Frequency	Percent
GENDER	Female	95	34.2
	Male	183	65.8
	Total	**278**	**100.00**
AGE GROUP	< = 20	9	3.2
	21-35	131	47.5
	36-50	71	27.5
	51 and Above	66	23.2
	Total	**278**	**100.0**
EDUCATIONAL LEVEL	Grade12 and below	6	2.2
	Diploma	122	43.9
	1st degree	95	34.2
	Above degree	55	19.8
	Total	**278**	**100.0**

Source: Own Survey, 2023

Concerning educational qualification, as the above table indicates, the majority of the respondents were diploma holders, which was about 43.9 percent. The next larger numbers of respondents were degree holders, which was about 34.2 percent. The third largest numbers of respondents, about 19.8 percent, were hold master's degree and above. Only 2.2 percent of the respondents have Grade12 and below educational qualification. This result indicates that the majority of individuals participated in the process of outbound logistic management have acquired higher education.

Table 4: Demographic Information of Respondents

Experience of Respondents in their organization	Less than a Year	75	27.0
	1-5 Years	65	23.4
	6-10 Years	64	23.0
	Above 10 Years	74	26.6
	Total	**278**	**100.0**
Role in the company/organization	Medical Representatives	58	20.9
	Technical Manager	82	29.5
	Product Manger	60	21.6
	Pharmacists	38	18.9
	Others	30	10.8
	Total	**278**	**100.0**

Source: Own Survey, 2023

Table 5 above shows the Job position of respondents in their organization. 29.5%, 20.9%, 21.9% of respondents were working as Technical manager, medical representative and Product Manager respectively. Regarding work experience of the respondents, the majority (27.0%) had less than 5 years of experience, or 73% of respondent had less than 10 years of experience in the field. It could be possible to conclude that, the majority of respondents are moderately experienced in the field, which is below ten years.

3.6.4. Methods of Data Analysis

Descriptive statistics and inferential statistics specifically, the impact of independent variables on the dependent variable of the chosen pharmaceutical manufacturing enterprises was examined using a multiple regression model. A recent version of SPSS was used for the data analysis. The demographic information of the respondents was analyzed using frequencies and percentages.

3.6.5. Econometric Model Development

To test the hypotheses, the data has analyzed using multiple regression and Pearson correlation Matrix. Equation 1 has used as the base regression models to test the hypotheses and establish

the distribution effectiveness determinants. The multiple regression model of the study has the following form:

$DE\ i = \alpha\ 0 + \beta_1 FINCIALC + \beta_2 TRANSPOT + \beta_3 INFSYM + \beta_4 GOVTDONER + \varepsilon i \ldots$ (Equation 1)

Where,

DE = Outbound Logistics Effectiveness (Dependent variable)

FINCIALC= Financial Capacity

TRANSPOT= Transport Outsourcing

INFSYM = Information System

GOVTDONER= Government and Donor Agency Relationships

α - Constant

Ɛ - Error term

3.7 Reliability and Validity Instruments

3.7.1. Validity Test

Three different types of validity were discussed by Heale & Twycross (2015) in their study: construct validity, predictive validity, and content validity. Through a review of the literature and the adoption of instruments from earlier studies, this study addressed content validity in order to determine the extent to which the data collection instruments measure what it is designed to measure.

3.7.2. Reliability Test

The internal consistency of the research tool is an issue of reliability analysis. According to Saunders et al. (2009), reliability is the degree to which data gathering methods or analysis processes produce consistent results. When a study includes Likert items in questionnaires that create a scale and researchers want to know if the scale is reliable, they most frequently utilize Cronbach's Alpha, a measure of internal consistency and reliability. In order to ensure the

internal consistency of the study's questionnaire, a preliminary Cronbach's Alpha test was undertaken.

The Cronbach's alphas for this study are between 0.720-0.781 and this suggested that the data are reliable and consistent with acceptable research norms and standards. The variables showed an acceptable range of reliability and the Cronbach alpha obtained for all scales was consistent with previous studies.

Table 05: Results of the reliability test

No	Construct	Number of Items	Cronbach's α
1	Financial Capacity	4	.720
2	Information System	5	.769
3	Transport Outsourcing	5	.729
4	Relations with Government and Donors	5	.781
4	Outbound Logistics Effectiveness	8	.740

3.8. Ethical Issues

Ethics are norms or standards of behavior that guide moral choices about the researcher's behavior and relationship with others. The goal of ethics in research is to ensure that no one is harmed from adverse consequences from research activities (Cooper and Schindler, 2008). Ethics observed accordingly in conducting this research. Introductory letters has taken from the department of management and send to all respondents for permission to use them in the study. In the data collection process, informed consent of the respondents has sought and respondents have guaranteed anonymity and confidentiality by the researcher. All citations have duly acknowledged and all participants treated respectfully.

Chapter Four

4. Result and Discussion

4.1. Descriptive Analysis of Independent Variables

The aim of this research is to identify the major contributing factors that affect outbound logistic effectiveness of pharmaceutical products. Of those factors the researcher was focusing on investigating the effect of financial capacity, transport outsourcing, use of information technology on the distribution and finally on donors and government relationship that how those factors directly or indirectly affecting pharmaceutical products outbound logistics management performance. Thus, this section presents the results of the statistical analysis and interpretations of the data using mean and standard deviations. The self-administered questionnaires were prepared and presented using a five point Likert scale where Strongly Disagree (SDA) = 1, Disagree (DA) = 2, Neutral (N) = 3, Agree (A) =4, and Strongly Agree (SA) =5. By using here under indicated cut off points to the mean scores, descriptive statistics part of the research discussed here under: Likert scale 1-1.8 (Strongly Disagree), 1.81-2.60 (Disagree), 2.61-3.40(Neutral), 3.41-4.20 (Agree), 4.21- 5 (Strongly Agree) can be applied here.

4.1.1. Descriptive statistics on items of Financial Capacity

The study results shown in the table below confirms that with a mean of 4.23 and a standard deviation of 0.96, respondents selected from pharmaceutical manufacturing companies; distributors (wholesales); retail outlets (public and private hospitals) strongly believe that availability of funds leads to have highest stock in the manufacturing company. Besides, as the study results indicate the existence of strong financial capacity in pharmaceutical manufacturers and distributors could improves availability of pharmaceutical products in the country, with a mean of 4.18 and a standard deviation of 1.02. Furthermore, with a mean of 4.16and a standard deviation of 0.97, sample respondents' financial capacity has great impact on effectiveness of pharmaceutical products outbound logistics in a country. Finally, respondents agreed that greater finance in the manufacturing company improves the sustainable delivery of products with a mean of 4.05 and a standard deviation of 1.00. The table below compares the items of financial capacity of manufacturing companies.

Table 06: Descriptive statistics on items of pharmaceutical companies' financial capacity

Descriptive Statistics pharmaceutical companies' financial capacity			
	N	Mean	Std. Deviation
Strong financial capacity can improves availability of pharmaceutical products in the country.	278	4.18	1.02
The greater finance in the manufacturing company improves the sustainable delivery of products.	278	4.05	1.00
Availability of funds leads to have highest stock in the manufacturing company.	278	4.23	.96
I believe financial capacity has great impact on effectiveness of pharmaceutical products outbound logistics in a country.	278	4.16	.97
Valid N (listwise)	278		

Source: Own Survey, 2023

4.1.2. Descriptive statistics of items on Information System

The researcher was asked five questions regarding various applications of the current information system for improving the performance of the distribution of pharmaceutical products in response to the questions regarding the relationship between information system and pharmaceutical products outbound logistics management performance. Thus, results from the study shown in the table below confirms that with a mean of 4.19 and a standard deviation of 0.99, respondents agreed that using information system has been very useful to manage shortage of pharmaceutical products in a country. Moreover, the study results indicate that sample respondents of the study have agreed that the role of information system is very high in profitability and its competitiveness efficiency of the company, with a mean of 4.09 and a standard deviation of 1.05. Besides, with a mean of 4.05 and a standard deviation of 1.00, respondents selected from pharmaceutical manufacturing companies; distributors (wholesales); retail outlets (public and private hospitals) agreed that using information technology affects effectiveness of pharmaceuticals manufacturers' outbound logistics in higher degree. Moreover, respondents agreed that the use of information system decreased the time needed to perform the complete task of the pharmaceutical manufacturing company with a mean value of 3.93 and a standard deviation of 1.09.Finally, respondents revealed that, beyond improving the different activities of outbound logistic management, the use /application of information system decreases the cost of the pharmaceutical products, with a mean of 3.77 and a standard deviation of 1.29. The table below compares the items on information system:

Table07: Descriptive statistics of items on Information System

Descriptive Statistics of items on Information System			
	N	Mean	Std. Deviation
Using information technology affects effectiveness of pharmaceuticals manufacturers' outbound logistics in higher degree.	278	4.05	1.00
The use of information system decreased the time needed to perform the complete task of the manufacturing company.	278	3.93	1.09
Using information system has been very useful to manage shortage of pharmaceutical products in country.	278	4.19	.99
The role of information system is very high in profitability and its competitiveness efficiency of the company.	278	4.09	1.05
The use /application of information system decreases the cost of the pharmaceutical products.	278	3.77	1.29
Valid N (listwise)	278		

Source: Own Survey, 2023

4.1.3. Descriptive statistics on items of Transport Outsourcing

As depicted below in the table, it was found that with a mean of 3.93 and a standard deviation of 1.15, majority of respondents agreed that outsourcing of transport affects the effectiveness of pharmaceuticals manufacturers' outbound logistics in a higher degree. Moreover, the study results indicate that sample respondents of the study has agreed that better transportation results in fast frequent deliveries of pharmaceutical products in the company, with a mean of 4.16 and a standard deviation of 0.98. Besides, with a mean of 4.19 and a standard deviation of 0.99, respondents selected from pharmaceutical manufacturing companies; distributors (wholesales); retail outlets (public and private hospitals) agreed that vehicle availability of manufacturing company has high impact on effective pharmaceutical products outbound logistics. Finally, respondents revealed that, Transport outsourcing takes higher responsibilities in scheduling all distribution routes to scattered customers, with a mean score of 4.09 and a standard deviation of 1.05. The table below compares the items on transport outsourcing:

Table 08: ***Descriptive statistics on items of items of Transport Outsourcing***

Descriptive Statistics			
	N	Mean	Std. Deviation
Outsourcing of transport affects the effectiveness of pharmaceuticals manufacturers' outbound logistics in a higher degree.	278	3.93	1.15
Better transportation results in fast frequent deliveries of pharmaceutical products in the company.	278	4.16	.98
Vehicle availability of manufacturing company has high impact on effective pharmaceutical products outbound logistics.	278	4.19	.99
Transport outsourcing takes higher responsibilities in scheduling all distribution routes to scattered customers.	278	4.09	1.05
Transport outsourcing results special process on quality delivery and cost reduction of products to be deliver.	278	3.83	1.13
Valid N (listwise)	278		

Source: Own Survey, 2023

4.1.4. Relationship between government, donors and manufacturers items

Furthermore, as a fourth determining factor of pharmaceutical products outbound logistics management performance, relationship between government, donors and manufacturers has measured with five items as it depicted below in the table. The result from data analysis indicated that, with a mean of 3.38 and a standard deviation of 1.38, respondents became neutral on the existence of good coordination in the procurement of drugs between parent ministries, donors and the manufacturing company in outbound logistic process. Furthermore, with a mean of 4.20 and a standard deviation of 1.00, respondents revealed that the existence of good relationship among/between government and manufacturers leads high improvement of pharmaceuticals manufacturers' outbound logistics management process. In addition, as of the study results showed in the table below, respondents agreed with the item stated that existence of good relationship between manufacturers, distributors and governments provides good result in availability of pharmaceutical products, with a mean of 4.17and a standard deviation of 0.89. Moreover, the presence of strong association between manufacturers, distributor and the government reduces the cost of outbound logistic process of pharmaceutical products with a mean of 4.13 and a standard deviation of 1.05. Finally, sample respondents revealed that the legal issues of the country is directly relate to sustainable delivery of pharmaceutical products of the manufacturers with a mean score of 4.08 and a standard deviation of 1.09.The table below

presents the mean and standard deviation value of the relationship between Outbound Logistics Performance and the two major stakeholders, namely donors and the government.

Table 09: Descriptive statistics of relationship between government, donors and manufacturers items

Descriptive Statistics			
	N	Mean	Std. Deviation
Good coordination in the procurement of drugs between parent ministries, donors and the manufacturing company is very high in outbound logistic process.	278	3.38	1.38
The relationship among/between government and manufacturers leads high improvement of pharmaceuticals manufacturers' outbound logistics management process.	278	4.20	1.00
The relationship between manufacturers, distributors and governments provides good result in availability of pharmaceutical products.	278	4.17	.89
Strong association between manufacturers, distributer and the government reduces the cost of outbound logistic process of pharmaceutical products.	278	4.13	1.05
The legal issues of the country is directly relate to sustainable delivery of pharmaceutical products of the manufacturers.	278	4.08	1.09
Valid N (listwise)	278		

Source: Own Survey, 2023

4.1.5. Descriptive statistics on outbound logistic effectiveness of pharmaceuticals

The respondents' view of outbound logistic effectiveness in pharmaceuticals displayed in tables below. As one can heed from the study results indicated below in the table, respondents are agreed with pharmaceutical manufacturing companies in effectively providing continues supply of medicine and supplies. This item has a mean of 3.65 and a standard deviation of 1.33. Moreover, sample respondents showed that manufacturing companies' products are distribute to health facilities, branches timely upon requested, and the item has a mean value of 3.62and a standard deviation of 1.32. Moreover, with the aggregate mean of 3.44and a standard deviation of 1.24for latent items in measuring outbound logistic effectiveness, respondents became neutral for the item stating pharmaceutical manufacturing companies effective in lessen wastage of medicine. The table below illustrates the comparison of latent items in measuring outbound logistic effectiveness:

Table 10: Descriptive statistics on items of outbound logistic effectiveness

Descriptive Statistics					
	N	Min.	Max.	Mean	Std. Deviation
Pharmaceutical manufacturing companies are effective in providing continues supply of medicine.	278	1.00	5.00	3.65	1.33
Manufacturing companies products are distributed to health facilities and branches timely upon requested	278	1.00	5.00	3.62	1.33
Pharmaceutical manufacturing companies effective in lessen wastage of medicine	278	1.00	5.00	3.44	1.24
Pharmaceutical manufacturing companies uses reliable information regarding distribution of pharmaceutical products	278	1.00	5.00	3.57	1.32
Pharmaceutical manufacturing companies are distributing medicine with its original quality in the process of the distribution and delivery.	278	1.00	5.00	3.64	1.37
There is a clear line of communication between outbound logistic management department the company.	278	1.00	5.00	3.66	1.33
The product when they deliver stored with appropriate identification label expiry date and manufacturing date	278	.00	5.00	3.50	1.52
Product before and during delivery stored based on the temperature specification manufactured products	278	1.00	5.00	2.94	1.4
Valid N (listwise)	278				

Source: Own Survey, 2023

4.2. Inferential Statistics Results of the Study

4.2.1 Tests of Assumptions of Multiple Regression Model

Before getting into the regression analytical procedures to serve the study's major purposes of examining factors influencing the effectiveness of outbound logistic management of pharmaceutical manufacturers and distributors, there was, a need to execute certain important statistics on the data gathered for the independent and the dependent variables of the study. This was done for showing the fulfillment of some major assumptions of the regression model. Gorard (2001) has indicated that in using regression techniques, one has to be faithful to the assumptions underpinning.

This can cause the researcher to reach invalid or data-unsupported conclusions. A multiple regression analyzes the relationship between a single result measure and numerous predictors or

independent variables.(Henderson & Velleman, 1981). The assumptions of multiple regressions include the assumptions of linearity, collinearity, normality, homoscedasticity and independence of errors. The following section describes each tests of assumption taken for this study.

1. Test of Linearity (Correlations)

The first and one of the most important regression assumptions set out by Gorard (2001) was a test of linearity of relationships; which asserts that there is an approximate linear relationship between the dependent variable and the independent variables, both individually and grouped. To this end, the researcher computes Pearson product moment correlation.

Financial Capacity and outbound logistics have a moderately favorable but statistically significant association (r=0.404, P0.01). It demonstrates that financial capacity is directly and favorably correlated with the efficiency of outbound logistics; the correlation coefficient value, which is 0.404, is statistically significant with a 0.01 probability of significance.

Information system and outbound logistics have a substantial positive link, according to the findings of the Pearson product moment correlation study (r=0.512, p.01). The correlation coefficient of 0.512 indicates that there is a positive and significant correlation. This would imply that improved outbound logistics are brought about by better information systems. The correlation coefficient between outsourced transportation and their outward logistics efficacy, as shown in the table below, showed a statistically significant, moderate, and positive relationship between the two (r=0.477, p.01). This implies that increased transportation outsourcing and facilitation have an impact on improving outbound logistics study.

Table 11: Pearson product moment correlation of study variables

Correlations						
		FACAPP	INFOSS	TROUTT	MGDRPP	OUTLOG Effectivnes
FACAPP	Pearson Correlation	1	.777**	.477**	.598**	.404**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	278	278	278	278	278
INFOSS	Pearson Correlation	.777**	1	.539**	.583**	.512**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	278	278	278	278	278
TROUTT	Pearson Correlation	.477**	.539**	1	.717**	.432**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	278	278	278	278	278
MGDRPP	Pearson Correlation	.598**	.583**	.717**	1	.442**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	278	278	278	278	278
OUTLOG Effectiveness	Pearson Correlation	.404**	.512**	.432**	.442**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	278	278	278	278	278
**. Correlation is significant at the 0.01 level (2-tailed).						

2. Test of Multicollinearity

Moreover, collinearity diagnostics on the variables as part of the multiple regression procedure done using tolerance and variance inflation factor (VIF). Tolerance is an indicator of how much of the variability of the specified independent variable is not explain by the other independent variables in the model. If this value is very small (less than 0.10), it indicates that the multiple correlation with other variables is high, suggesting the possibility of multicollinearity (Pallant, 2010). Furthermore, the other value given is the VIF, which is just the inverse of the tolerance value (1 divided by tolerance). According to Pallant (2010), VIF values above 10 would be a concern, indicating multicollinearity.

Table 12: Test of Multicollinearity

	Collinearity Statistics	
Model	Tolerance	VIF
Financial Capacity	.363	2.758
Information System	.358	2.793
Transport Outsourcing	.462	2.165
Government Donors Relationship	.400	2.501

3. Normality Test

Skewness and kurtosis values provided as part of the descriptive statistics output, giving information about the distribution of scores for the two groups. Skewness is the measures of the asymmetric. The normal distribution is symmetric has a skewness zero. Distribution with a significance positive skewness has a log right tail. Distribution with a significance negative skewness has a log left tail. As a guideline, skewness values more than twice its standard error taken to indicate a departure from symmetry.

Kurtosis, on the other hand, is a measure of the extent to which observation cluster around a central point. For a normal distribution, the value of the kurtosis is zero. Positive kurtosis indicates that, relative to a normal distribution, the observation are more clustered about the center of the distribution and have thinner tails until the extreme value of the distribution at which point the tails of the leptokurtic distribution are thicker relative to a normal distribution. Negative kurtosis indicates that relative to the normal distribution the observations are cluster less and have thicker tails until the extreme value of the distribution at which point the tails of the platy kurtic distribution is thicker relative of normal distribution.

Based on the result obtained, the coefficient of skewness for the dependent variable was (-0.503) and kurtosis (0.872). This shows that according to Tabachnick et al., (2019), the acceptable range for skewness or kurtosis is below +1.5 and above -1.5 If not, you have to consider transferring data and considering outliers again. Absolute values > 0.2 indicate noticeable skewness (Hildebrand, 1986). Thus, the distribution is normal for this study.

Table 13: Skewness and kurtosis values

Descriptive Statistics				
	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Financial Capacity	-1.405	.146	.185	.291
Information System	-1.337	.146	.862	.291
Transport Outsourcing	-1.430	.146	1.478	.291
Government Donors Relationship	-1.353	.146	1.176	.291
Outbound Logistic Effectiveness	-.503	.146	.872	.291
Valid N (listwise)				

Besides, one of the ways that these assumptions can check is by inspecting the residuals scatter plot and the normal probability plots of the regression-standardized residuals that requested as part of the analysis. These are present in normal P-P Plots of regression standardized residuals graph. In normal probability plots the point has lie in reasonably, straight diagonal line from bottom left to top right. This would suggest no major deviations from normality. The finding from normal P-Plot reveals no violation of normality assumptions. The study used both methods of assessing normality; graphically using Normal Probability Plot (P-P) graph.

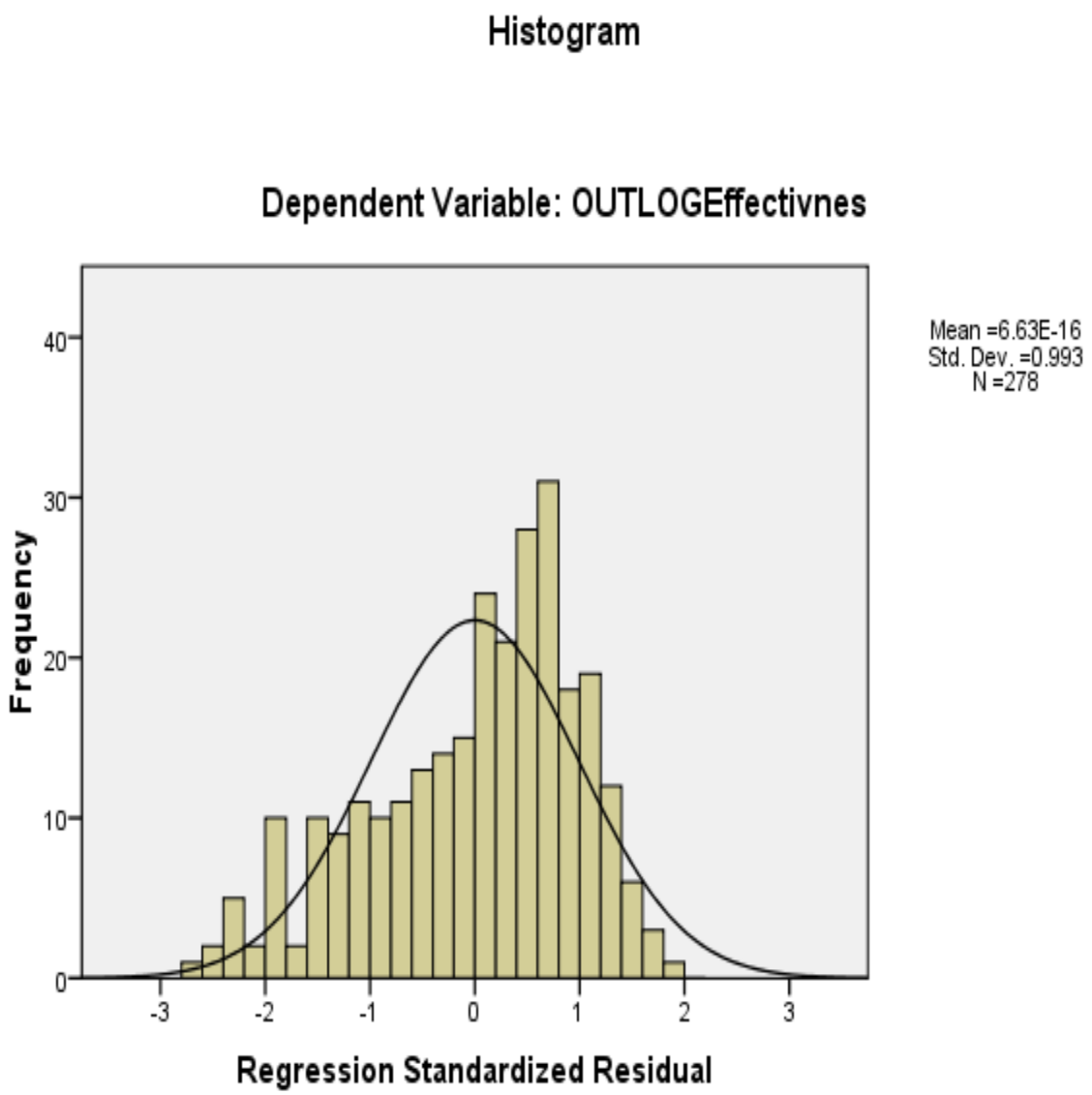


Figure02: Normal Probability Plot of Standardized Residual

In the first way of testing for the normality of the data of the current study, it was attempted to have a look at a graph showing the scores for the dependent variable (outbound logistic management) and see if the distribution grossly deviates from a bell-shaped normal distribution and determines whether the data approximates a normal distribution or not. As shown in figure above, the bell-shaped black line on the histogram represented the "normal" curve, and it was possible to notice that there were few outliers which had insignificant frequency to deviate from the standard normal curve, and hence, from the mean. Therefore, it was possible to deduce that the data measuring the dependent variable for fitted values were normal and, thus, approximated the normality of distribution and could not create potential threats to the regression model.

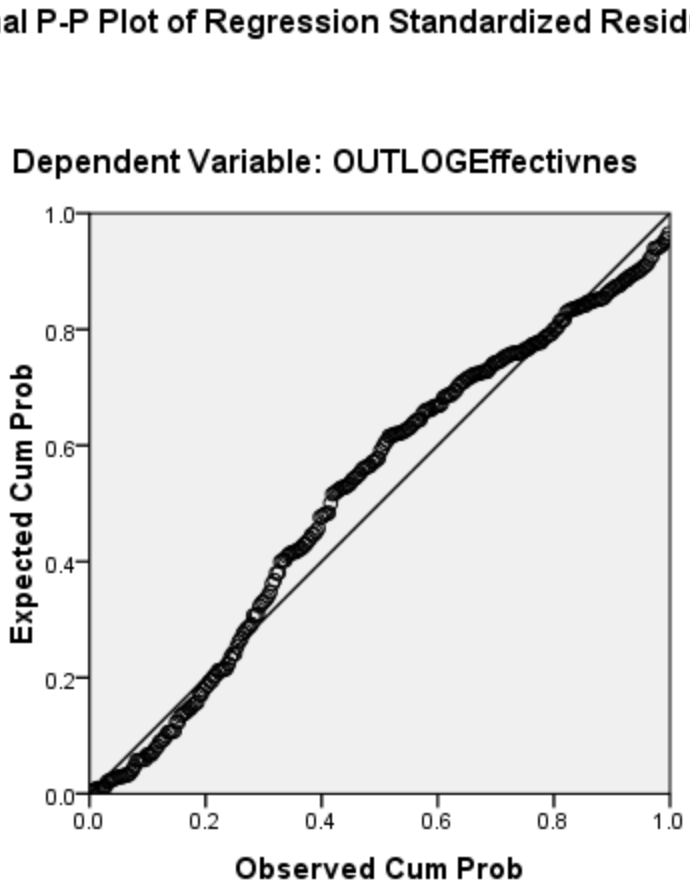


Figure 03: Normal P-P Plot of Regression Standardized Residual

In the Normal Probability Plot, points lie from bottom left to top right in a rather straight diagonal line. This would imply that there are no notable departures from normality. The study used a normal P-P regression plot. To check for linearity, Standardized Residuals can be seen in the above graphic. Linearity pattern was seen because the points were symmetrically dispersed along a diagonal line. As a result, the residuals' linear connection with the projected dependent variable scores showed that linearity was achieved.

4. Homoscedasticity

According to Saunders, et al. (2009), the degree of homoscedasticity refers to how closely the data values for the dependent and independent variables match in variance. According to Field's (2009) explanation, the residual terms' variance at each level of the predictor variables should be constant, meaning that the residuals at each level of the predictors should have the same variance. Therefore, verifying this assumption is helpful for determining the regression model's suitability. In order to determine the degree of homoscedasticity, Field (2009) recommended plotting the standardized residuals, or errors, (ZRESID) on the Y-axis and the standardized projected values of the dependent variable based on the model (ZPRED) on the X-axis.

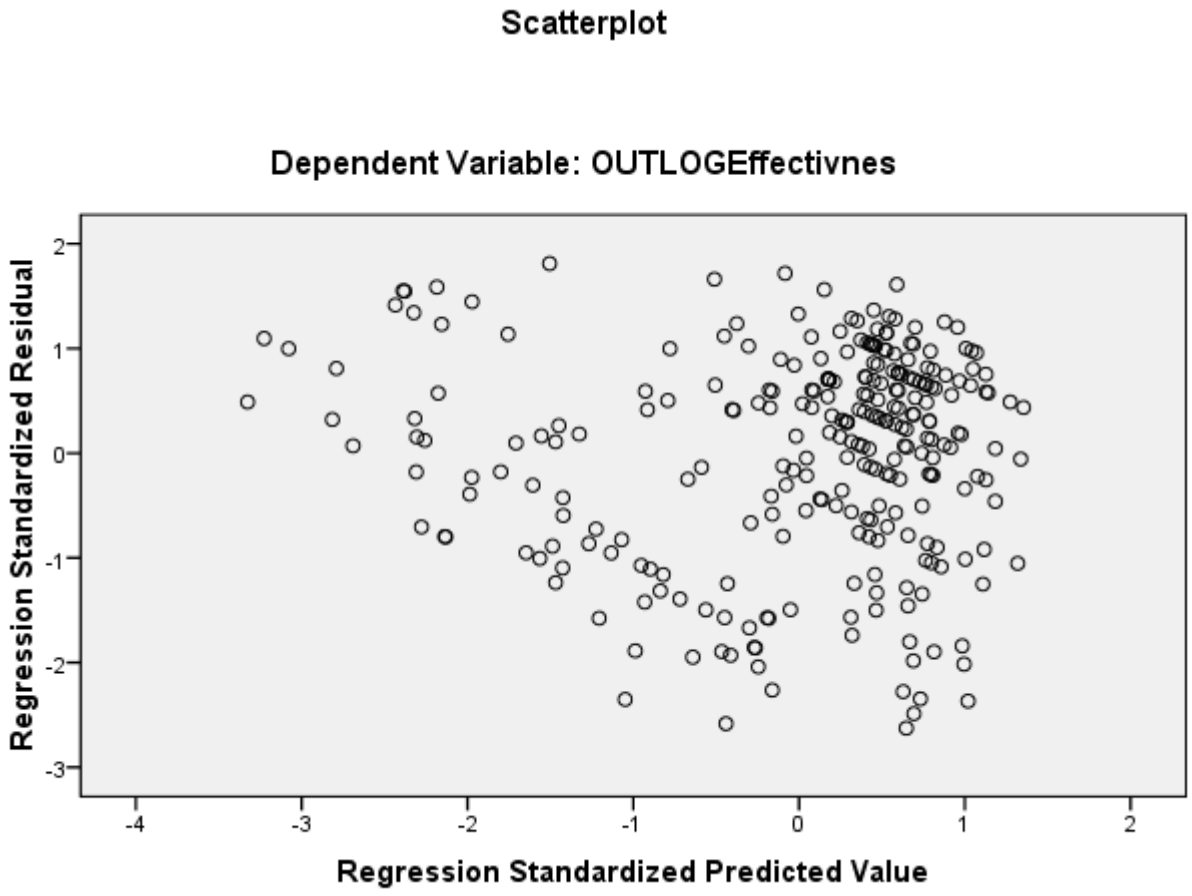


Figure 04: Scatterplot

A lack of homoscedasticity is indicated by larger errors (residuals) for specific areas of the range, which may be seen on the scatter plot, according to Garson (2012). Homoscedasticity aids in determining whether the relationship under examination is the same throughout the full range of

the dependent variable. Accordingly, if the homoscedasticity requirement is to be met, the graph of *ZRESID and *ZPRED should resemble a random array of dots equally spaced around zero. Similar to the above picture, this cloud of dots, which are spread about zero, has practically all of its points randomly and evenly distributed throughout the plot with almost no visible outliers. As a result, we can say that the assumptions of homoscedasticity and random mistakes have been encountered.

5. Independence of Errors

Multiple regression makes the assumption that there is no serial connection and that the errors, which are the residuals between the real score and the estimated score derived by the regression equation, are independent (Stevens, 2009). The absence of serial correlation between the residuals suggests that the magnitude of the residual for one variable has no bearing on the size of the residual for another. Therefore, the independence assumption demands that the variables and residuals are independent and that the subjects are responding independently of one another (Stevens, 2009). Before interpreting the results of a multiple regression analysis, it is important to analyze the independence assumption because its violation could have serious repercussions (Stevens, 2009). Any modest breach of the independence presumption should take seriously because it can significantly raise the risk of Type I error, increasing the likelihood that the null hypothesis could be incorrectly rejected by a factor of several times the amount of error envisioned for the test (Stevens, 2009).

A statistical technique called Durbin-Watson can be used to determine whether there is serial correlation between residuals. Durbin-Watson (DW) statistics have a value between 0 and 4. While a number closer to 0 indicates there is likely to be serial correlation, a Durbin-Watson value near to 2.0 is compatible with the absence of serial correlation. The value of DW in this investigation is 1.646, which is closer to 2.0.Additionally, the fact that the Durbin-Watson score is between 1 and 2.5 suggests that the data are not automatically connected. As a result, there is no serial correlation between the study's variables. A statistical technique called Durbin-Watson can be used to determine whether there is serial correlation between residuals. Durbin-Watson (DW) statistics have values between 0 and 1.Durbin-Watson (DW) statistics have a value between 0 and 4. While a number closer to 0 indicates there is likely to be serial correlation, a

Durbin-Watson value near to 2.0 is compatible with the absence of serial correlation. The value of DW in this investigation is 1.646, which is closer to 2.0.Additionally, the Durbin-Watson value ranges from 1 to 2.5 means there is no autocorrelation in the data. As a result, there is no serial correlation between the study's variables.

Table 14: Durbin-Watson Analysis

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.552[a]	.305	.295	.74421	1.646
a. Predictors: (Constant), MGDRPP, INFOSS, TROUTT, FACAPP					
b. Dependent Variable: Outbound Logistic Effectiveness					

4.2.2 Multiple Linear Regression Analysis Result

Regression model used in an explanatory study where researcher is interested in predicting the value of dependent variable based on the value of independent variable. While in case of more than one independent variables in the study, researcher has to make use of multiple regression models (Golfinopoulos et al., 1998).

Analyzing relationships between two or more independent variables and one dependent variable is done using multiple linear regressions. Examining the elements influencing the efficiency of medicines' outbound logistical management is the goal of this investigation.

Table 15: Model Summary

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.552[a]	.305	.295	.74421	1.646
a. Predictors: (Constant), MGDRPP, INFOSS, TROUTT, FACAPP					
b. Dependent Variable: Outbound Logistic Effectiveness					

R square also defines the goodness-of-fit or the percentage of variation explained by a given collection of predictor variables, as seen in the table above, which also displays the correlation

coefficient R, which denotes that there are numerous factors influencing the dependent variable. The value of R in this model is 0.552, indicating a strong link between the dependent and independent variables. The adjusted R square value is 0.305. This suggests that the independent variables (financial capacity, information system, and transport outsourcing, government and donors' connection) can account for 30.5% of the variation in outbound logistic management efficacy. Additionally, the remaining 69.5% needed additional research because it was explained by other variables that were not found in this study.

Table 16: Analysis of Variance (ANNOVA)

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	66.268	4	16.567	29.913	.000[a]
	Residual	151.200	273	.554		
	Total	217.468	277			
a. Predictors: (Constant), MGDRPP, INFOSS, TROUTT, FACAPP						
b. Dependent Variable: Outbound Logistic Effectiveness						

As a result, we may draw the conclusion that our regression model considerably improves the ability to forecast outbound logistics management and that, on the whole, the regression model is a good predictor of overseas logistics management or a good fit for the data. The three independent variables have a joint and significant link with outbound logistic management, according to our interpretation of the ANOVA result, and the model is statistically significant.

Table 17: Model Coefficients between Dependent and Independent Variables

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.510	.299		1.704	.090
	Financial Capacity	-.069	.100	-.058	-.693	.489
	Information System	.470	.100	.397	4.701	.000
	Transport Outsourcing	.183	.093	.146	1.963	.051
	Government Donors Relationship	.165	.094	.141	1.763	.079
a. Dependent Variable: Outbound Logistic Effectiveness						

The researcher employs standardized beta to rate the component according to the strength of its impact. High standardized beta denotes high influence for the component.

So that the only significant and highest determinant of outbound logistics went to information system with Standardized beta = 0.470. As per the multiple regression result, the remaining independent variables in this study have found to have insignificant influence on outbound logistics effectiveness of pharmaceuticals. However, transport outsourcing and government donors relations also have positive relations with the outcome variable though it is insignificant.

Outbound logistics is positively influenced by information system, transport outsourcing, government donor's relationship. Based on the unstandardized coefficients result of the study, information system has a coefficient of (B= 0.470) with significant value equal 0.000(<0.05); transport outsourcing has a coefficient of (B= 0.183) with insignificant value equal 0.051(>0.05); and government donors' relationship has a coefficient of (B= 0.165) with insignificant value equal 0.079(>0.05).

Thus, information system has the most significant influence on outbound logistics. The manufacturers and distributors transport outsourcing, relationship with government and donors, have positive but insignificant influence on outbound logistics because its P value is greater than

0.05. In this study, financial capacity has found to negatively, but insignificantly influence outbound logistic effectiveness in contrary to previous studies.

The researcher has discovered a fascinating problem with relation to financial capabilities. This financial capability has showed a positive relationship in both descriptive and correlation analysis, however the relationship between those two variables has demonstrated a negative, insignificant association in multiple linear regression analysis (P value = -0.069 >0.05). This might occur because, when compared to the other three components, the fraction of changes attributable to outward logistics would be minimal and negative.

Thus, the individual variable separately information system (B) =0.470 holding the other factors are constant a one unitimprovement or increase in information system of pharmaceutical manufacturers and distributors would results improvement of outbound logistics by 0.470 unit when the measurement is in unit. Besides, the individual variable separately transport outsourcing (B) =0.183 holding the other factors are constant a one unitimprovement in transport outsourcing of pharmaceutical manufacturers and distributors would results improvement of outbound logisticsdimension by 0.183 unit when the measurement is in unit. Finally, the individual variable separately manufacturers and distributors relationship with government and donors (B) =0.165 holding the other factors are constant a one unitimprovement in the manufacturers and distributors relationship with government and donorswould resultsimprovement of outbound logistics by 0.165 unit when the measurement is in unit.

$$DE\ i = \alpha\ 0 + \beta 1 FINCIALC + \beta 2 TRANSPOT + \beta 3 INFSYM + \beta 4 GOVTDONER + \varepsilon i \ldots \text{(Equation 1)}$$

Where,

DE = Outbound Logistics (Dependent variable)

FINCIALC= Financial Capacity

TRANSPOT= Transport Outsourcing

INFSYM = Information System

GOVTDONER= Government and Donor Agency Relationships

α - Constant

Ɛ - Error term

DE i = α 0+ 0.069FINCIALC + 183TRANSPOT + 470INFSYM + 165GOVTDONER +εi… (This is the optimal model based on the finding of this study.)

Hypothesis Testing

Under this sub title, the outlined research hypothesis at the beginning of the study has tested as per the findingsof the study:

H1: Financial Capacity has a significant positive impact on outbound logistics effectiveness.

As the result shows, financial Capacity had Beta value of -0.069 and P-value of 0 .47 which is greater than 0.05; therefore, the **H1** hypothesis that states financial Capacity has a significant positive impact on outbound logistics effectiveness is rejected but **Ho** hypothesis accepted. Thus, financial capacity had negativeand insignificant influence on outbound logistics effectiveness.

H2: Transport outsourcing has significant positive impact on outbound logistics effectiveness.

As shown in table 8, transport outsourcing has Beta value 0.183 and P- value 0 .051 which is greater than 0.05; thus, the **H1**hypothesis that statestransport outsourcing has a significant positive impact on outbound logistics effectivenessrejected but **Ho** hypothesis accepted. This finding also leads to conclude that transport outsourcing has positive butinsignificant influence on outbound logistics effectiveness.

H3: Information system has a significant positive impact on outbound logistics effectiveness.

As shown in table8, information systemhas Beta value 0.470 and P- value 0 .000 which is less than 0.05; thus, the **H1**hypothesis that states Information system has a significant positive impact on outbound logistics effectiveness accepted but **Ho** hypothesis rejected. This finding also leads

to conclude that information system has positive and significant influence on outbound logistics effectiveness.

H4: Relationship between government and donors has a significant positive impact on outbound logistics effectiveness

As the result shows, government and donors' relationship had Beta value of 0.165 and P-value of 0 .07 which is greater than 0.05; therefore, the **H1** hypothesis that states Relationship between government and donors has a significant positive impact on outbound logistics effectiveness is rejected but **Ho** hypothesis accepted. Thus, government donor's relationship had positive but insignificant influence on outbound logistics effectiveness.

4.3. Discussion

The researcher was attempting to identify the factors that affected the logistics of pharmaceutical products being shipped out. The researcher has attempted to compare the regression findings from the current study with those from other studies in the fields of outbound logistics, supply chain management, and distribution effectiveness in this section. Johnson (2006) asserts that the efficiency of a distribution function in the public sector depends on its ability to manage the finance function. In addition, Cooper (2006) believes that if a company is financially stressed, there can never be an efficient distribution.

Additionally, according to Netsanet Getachew (2018), financial capital might account for a sizable portion of the variation in distribution efficiency and export logistics. In order to achieve this, this research indicates that the goal of this component is to examine the impact of financial capacity on the efficiency of outbound logistics for pharmaceutical manufacturers and distributors. Contrary to the aforementioned findings, this study has demonstrated that financial capacity has a detrimental, if small, impact on the effectiveness of outward logistics.

Furthermore, outsourcing of transport has been used to save costs and increase output (Johnson, 2006). According to the author, understanding the process of defining objectives, establishing internal procedures for assessing performance versus objectives, and implementing systems that aid in effective function management are all essential components of a successful outsourcing relationship. However, the results of the current study indicate that the efficacy of outbound

logistics is not significantly impacted by transport outsourcing. Transport outsourcing of pharmaceutical manufacturers and distributors would result in an improvement of outbound logistics, as previously mentioned in the regression analysis portion of the study, although it is insignificant.

Additionally, prior research demonstrates that using information systems to manage transportation and distribution can increase predictability, cut waste, and improve efficiency in value chains, all of which benefit all market participants (Ceva, 2010). When used effectively, information system tools like cell phones, internet access, and a wide range of digital devices have the potential to increase efficiency in the following outbound logistics tasks: record keeping, monitoring field agent activities, procurement operations, credit and payment tasks, input distribution, measuring productivity, and forecasting (Cooper, 2006). Additionally, Netsanet Getachew (2018) found that an information system was capable of explaining a modest amount of variation in the efficiency of distribution and outbound logistics. To that purpose, this study demonstrates how information systems affect the efficiency of pharmaceutical producers' and distributors' outbound logistics. In this study, information system was discovered to have a favorable and significant influence on outward logistic efficacy, which is consistent with the aforementioned findings.

Last but not least, prior research demonstrated the significance of creating relationships between donors and governments in order to improve service delivery (Cadotte and Stern, 1979). Together, the donors and the host government can set a common objective that will serve as a guide for coordinating the use of the resources that are available to move toward the objective. The Pearson Product Moment Correlation showed that there was a significant association with the study's outcome variable regarding the relationship between government and donor integration and outbound logistics effectiveness. However, the regression coefficient suggests that government donor ties do have a small but favorable impact on the efficiency of outbound logistics. This implies that the effectiveness of pharmaceutical makers' and distributors' outbound logistics is positively impacted by the stakeholders' integration, though in a minor way.

5. Chapter Five

5. Summary of Key Findings, Conclusions, and Recommendations

This chapter presents a summary of findings, conclusions, and recommendations of the study. Findings from this study, which is based on analyzing previous chapters and in reference to the research questions in chapter one, presented as follows:

5.1. Summary of Key Findings, and Conclusions

The research was conducted with the goal of identifying the numerous elements that affect the efficiency of pharmaceutical outbound logistics. Based on the findings, the following conclusions are drawn: the situation with a few chosen Addis Ababa-based pharmaceutical manufacturers.

To this purpose, the researcher finds four independent variables (financial capacity, transport outsourcing, information technology, and donor and government integration are the components highlighted) that may have an impact on the study's outcome variable. Regression analysis unstandardized coefficients result revealed that information system has a coefficient of (B= 0.470=47%) with significant value equal 0.000(<0.05); transport outsourcing has a coefficient of (B=0.183=18.3%) with insignificant value equal 0.051(>0.05); and government donors' relationship has a coefficient of (B=0.165=16.5%) with insignificant value equal 0.079(>0.05). Therefore, information system was the sole significant and high influencer of outbound logistics whereas the remaining independent factors in this study were shown to have no significant impact on the effectiveness of pharmaceuticals logistics. In the meantime outbound logistics is positively influenced by information system transport outsourcing, government donor's relationship and negatively influenced by finical capacity (B=-0.69).

Overall, it was determined that the study's independent variables—financial capacity, information system, transports outsourcing, relationship between the government and donors accounted for 30.5% of the variation in outbound logistic management efficacy. Additionally, the remaining 69.5% needed additional research because it was explained by other variables that were not found in this study.

The study's Pearson correlation results, however, showed a positive association between the independent variables and the outcome variable. Financial capacity and outbound logistics management, transport outsourcing and outbound logistics management, and the relationship between government donors were all shown to have statistically significant and moderate associations. However, outbound logistic management and information systems work quite well together. Besides, this discovery also convinced the researcher that, when compared to the other study variables, the information system is the only one that can accurately predict how well pharmaceuticals perform in outbound logistics.

5.2. Recommendations

Following recommendations have been made for enhancing the effectiveness of pharmaceutical makers' and distributors' outbound logistics systems based on the study's findings and conclusions:

- The studies revealed that investment on information system improve effectiveness of outbound logistics by 47%. Thus, the discovery of a beneficial relationship between an organization's use of information systems and the efficiency of its outbound logistics. Therefore, pharmaceutical producers and distributors in Addis Ababa must vouch for the right application of technology to guarantee inventory accuracy, investing more on infrastructures of information system thorough and on-time reporting, and improved real-time feedback in order for outbound logistic management to be carried out effectively.

- Independent variables of this study accounts for 30.5% of the variation in outbound logistic management effectiveness. However, the remaining 69.5% needed additional research that may be explained by other variables such as customer's demand, supply chain visibility, product characteristics, regulatory compliance; which were not included in this research. Hence, manufacturing and Distribution Company, researcher and other concern bodies can further study to identify the entire variables that may have impact on pharmaceutical outbound logistics.

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Appendix I: Questionnaire

Addis Ababa University
School of Commerce
School of Graduate Studies

Questionnaires to collect data from employees of supply chain and marketing departments of selected pharmaceuticals manufacturing companies and pharmacists in public and private hospitals

Dear respondents;

The purpose of this questionnaire is to enable me to carry out a research for the partial fulfillment of master's degree. I am a student in the postgraduate program at the Addis Ababa University School of commerce. I am conducting a research on the topic: 'Factors affecting Pharmaceutical Products Outbound Logistics in Ethiopia' to fulfill the partial requirement for the Master of Logistic and Supply Chain Management (LSCM). Hence, this questionnaire is design to collect the necessary information/data to write the thesis on the subject under caption. To this effect, I will be grateful if you kindly take a few minutes of your precious time to complete this questionnaire. Do not write your name or any other form of identification on the questionnaire. Any information you present will keep utterly confidential and use only for academic purpose. Your cooperation and prompt response will be highly appreciated.

N.B:

- Writing your name is not necessary
- Put " ✓ " for your choice in the box provided

Part One: General Questions

1. Gender Male ☐ Female☐

2. Age Group(in years) Under 20☐ 21 – 35☐ 36 – 50☐ 51 – 65☐ Over 65☐

3. Educational Level 12 & below ☐ Diploma ☐ 1st degree ☐ above degree

4. What is your job position in the pharmaceutical company/ your organization?

    A. Medical Representatives ☐

    B. Technical manager ☐

    C. Product manager ☐

    D. Pharmacist ☐

5. How long have you worked for the company?

    A. Less than 1year ☐

    B. 1-5 years ☐

    C. 5-10 years ☐

    D. Above 10 years ☐

6. For how long has your company been in manufacturing/ distribute in Ethiopia?

    A. Under 5 years

    B. 6-10 years

    C. Over 20 years

    D. 11-15 years

    E. 16-20 years

Part Two: Survey on Pharmaceutical Products Outbound Logistics Items

Direction: This part of the questionnaire intends to find your view towards the Pharmaceutical Products Outbound Logistics.

Please thick the number that you feel most appropriate, using the scale of 1-5.

Where: 1-strongly disagree, 2- disagree, 3=neutral, 4- agree and 5=strongly agree

(Please tick (√) on your choice)

Table A 1: Questioner

No.	Statement	1	2	3	4	5
	Items on Financial Capacity of Manufacturing Companies					
1	Strong financial capacity can improves availability of pharmaceutical products in the country.					
2	The greater finance in the manufacturing company improves the sustainable delivery of products.					
3	Availability of funds leads to have highest stock in the manufacturing company.					
4	I believe financial capacity has great impact on effectiveness of pharmaceutical products outbound logistics in a country.					
	Items on Transport Outsourcing					
1	Outsourcing of transport affects the effectiveness of pharmaceuticals manufacturers' outbound logistics in a higher degree.					
2	Better transportation results in fast frequent deliveries of pharmaceutical products in the company.					
3	Vehicle availability of manufacturing company has high impact on effective pharmaceutical products outbound logistics.					
4	Transport outsourcing takes higher responsibilities in scheduling all distribution routes to scattered customers.					
5	Transport outsourcing especial process on quality delivery and cost reduction of products to be deliver.					
	Items on the use of Information System					
1	Using information technology affects effectiveness of pharmaceuticals manufacturers' outbound logistics in higher degree.					
2	The use of information system decreased the time needed to perform the complete task of the manufacturing company.					
3	Using information system has been very useful to manage shortage of pharmaceutical products in country.					
4	The role of information system is very high in profitability and its competitiveness efficiency of the company.					
5	The use /application of information system decreases the cost of the pharmaceutical products.					
	Items on relationship between manufactures, distributors, government and donors					
1	Good coordination in the procurement of drugs between parent ministries, donors and the manufacturing company is very high in outbound logistic process.					
2	The relationship among/between government and manufacturers leads high improvement of pharmaceuticals manufacturers' outbound logistics management process.					
3	The relationship between manufacturers, distributors and					

	governments provides good result in availability of pharmaceutical products.					
4	Strong association between manufacturers, distributer and the government reduces the cost of outbound logistic process of pharmaceutical products.					
5	The legal issues of the country is directly relate to sustainable delivery of pharmaceutical products of the manufacturers.					
	Items on outbound logistic effectiveness of pharmaceuticals' manufacturers					
1	Pharmaceutical manufacturing companies are effective in providing continues supply of medicine.					
2	Manufacturing companies products are distributed to health facilities and branches timely upon requested					
3	Pharmaceutical manufacturing companies effective in lessen wastage of medicine					
4	Pharmaceutical manufacturing companies uses reliable information regarding distribution of pharmaceutical products					
5	Pharmaceutical manufacturing companies are distributing medicine with its original quality in the process of the distribution and delivery.					
6	There is a clear line of communication between outbound logistic management department the company.					
7	The product when they deliver stored with appropriate identification label expiry date and manufacturing date					
8	Product before and during delivery stored based on the temperature specification manufactured products					

Thank you for a precious time you take in completing this questionnaire!