



**Factors Affecting International Pharmaceutical Procurement in Ethiopia: Ethiopian Pharmaceuticals Supply Service versus Private Importers.**

**A Thesis Submitted to Addis Ababa University Faculty of Business and Economics Department of Management in Partial Fulfillment of the Requirements for the Award of Master of Science Degree in International Business Management**

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**Addis Ababa, Ethiopia.**

## Declaration

I hereby declare that the work which is being presented in this paper entitled “Factors Affecting International Pharmaceutical Procurement in Ethiopia: Ethiopian Pharmaceuticals Supply Service versus Private Importers” in partial fulfillment of the requirements of the MSc Degree in International Business Management with the guidance and support of my research advisor. This thesis is my own work that has not been submitted or presented for any degree or MSc program in Addis Ababa University or any other institution. It does not contain any material, partly or wholly, published or written by others, except those that are referenced.

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## **Acronyms and abbreviations**

ANOVA	Analysis of Variance
CMD	Contract Management Directorate
DDGs	Deputy Director Generals
EFDA	Ethiopian Food and Drug Administration
EPSS	Ethiopian Pharmaceuticals Supply Service
NCB	National Competitive Bids
PFSA	Pharmaceutical Fund and Supply Agency
PHARMID	Medical Supplies Importer and Wholesale Distributor
PPA	Public Procurement and Property Authority
QMSD	Quantification and Market Shaping Directorate
SPSS	Statistical Package for the Social Sciences
TMD	Tender Management Directorate
UNICEF	United Nations Children's Fund
VIF	Variance Inflation Factor
WHO	World Health Organization

## ***Abstract***

*The objective of this study is to investigate the elements influencing international pharmaceutical procurement in Ethiopia, considering aspects such as quality, quantity, cost, location/source, and time within the private and public sector (EPSS). Based on various previous literatures, five factors are used as independent variables; Supplier selection, Procurement procedure, Buyer-supplier relationship, Demand forecasting, and Foreign currency. Primary data was collected from Private importers and EPSS (Ethiopian Pharmaceutical Supply Service) through questionnaires. An explanatory research design was employed for this research. The results of the research indicates procurement procedure, demand forecasting and foreign currency positively and significantly affect international pharmaceutical procurement in private importers whereas, buyer-supplier relationship, demand forecasting and foreign currency significantly affect the international pharmaceutical procurement in EPSS with foreign currency having a negative effect. The comparison between the two sectors show that both demand forecasting and foreign currency have a higher influence on international pharmaceutical procurement of private importers than EPSS. Therefore, the public and especially the private sector is expected to enhance its performance on these factors to achieve better quality, quantity, price, location/source, and shorter lead time in the procurement of pharmaceutical products.*

***Key words:*** *Supplier selection, Procurement procedure, Buyer-supplier relationship, Demand forecasting, Foreign currency and international pharmaceutical procurement.*

# CHAPTER ONE

## INTRODUCTION

### 1.1. Background of the study

Ensuring a steady supply of medications and pharmaceutical products is critical for the smooth functioning of hospitals. The procurement of drugs and handling any challenges that arise during the process are vital for ensuring uninterrupted access to drugs, and goals should be considered carefully. The goals encompass factors such as cost, efficiency, and quality. By employing appropriate purchasing strategies, potential issues such as excessive or insufficient drug inventory can be avoided. Acquiring medications and pharmaceutical products is achieved through procurement, which refers to obtaining goods and/or services at the lowest possible cost of ownership, in the appropriate quantity and quality, at the appropriate time, location, and source (Muhia et al., 2017).

Procurement covers the entire process of acquiring goods and/or services, starting with the identification of procurement needs by the agency. The procurement process includes risk assessment, exploration and evaluation of alternative solutions, contract award, delivery and payment for goods and/or services, and, if applicable, ongoing contract management and review of contract-related options (Amemba et al., 2013).

Ethiopia relies on a combination of locally produced pharmaceuticals and imports, including donations and purchases, to meet the demands of its pharmaceutical market. According to a study conducted by Wamae et al. (2016), less than 15% of the pharmaceutical products in the market are produced locally. In most developing countries, pharmaceutical manufacturing is primarily focused on the final stages of the process, such as repackaging or converting imported finished compounds into tablets, capsules, or liquids. However, a few developing nations with significant domestic markets and advancing technological capabilities are exceptions to this trend (Mogoi, 2010).

In the past, pharmaceuticals were imported and distributed by various entities, including governmental institutions, commercial importers, non-governmental organizations (NGOs), and international organizations like UNICEF and WHO, as noted by Wamae et al. (2016). However, presently, there has been a significant increase in the participation of private importers within the country.

To enhance the supply and distribution of crucial pharmaceuticals to public healthcare facilities, the Pharmaceutical Fund and Supply Agency (PFSA), currently known as Ethiopian Pharmaceuticals Supply Service (EPSS), was established by Proclamation in 2007, replacing the obsolete PHARMID. Its primary objective is to streamline the procurement, storage, and distribution of pharmaceuticals in Ethiopia (Wamae et al., 2016).

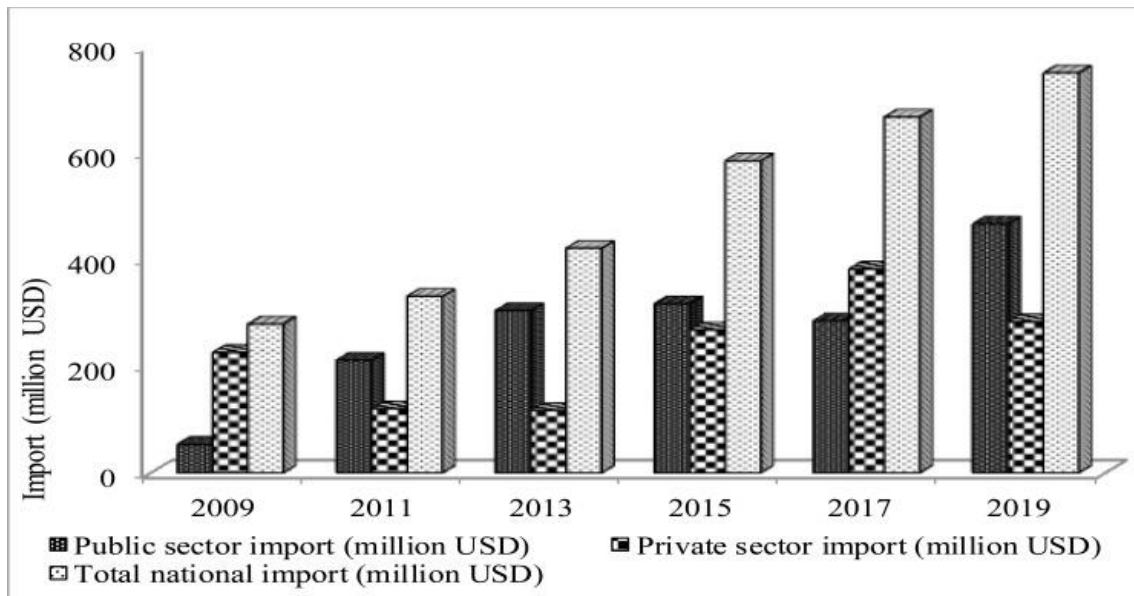
According to the World Health Organization (WHO, 1999), the procurement of pharmaceuticals in Ethiopia involves multiple steps, agencies, ministries, and manufacturers. The country's healthcare system has long consisted of components from the public, private, and nonprofit sectors. The primary public entity responsible for supplying pharmaceutical products is the Ethiopian Pharmaceuticals Supply Service (EPSS), which procures items through direct purchases, local tenders, and international tenders. Some pharmaceuticals are also provided to EPSS by sponsors of vertical programs for ARVs (Antiretroviral), TB (Tuberculosis) and malaria drugs, and reproductive health supplies. EPSS distributes drugs and medical equipment directly to healthcare facilities from its central hub located in Addis Ababa and regional hubs, as reported by Wamae et al. (2016).

To ensure proper handling of pharmaceutical products and minimize errors, the World Health Organization (WHO) recommends selecting medications based on a list of common diseases and accepted treatment protocols, as stated in guidelines of WHO (2015). By limiting the number of carefully chosen products, central warehouses, and service delivery sites can become familiar with the products and manage them more efficiently.

EPSS maintains a procurement list for the purchase of pharmaceuticals, which can be accessed on its website. The remaining supply of pharmaceuticals is sourced from private importers within the country, as noted by PFSA in 2018. Federal Democratic Republic of Ethiopia (Ministry of Health and Ministry of Industry) and the World Health Organization (2015) reported that approximately 70% of all pharmaceuticals utilized in the country are procured by the public sector through the Pharmaceuticals Fund and Supplies Agency (PFSA).

**Figure 1. 1**

*Public, private, and total finished pharmaceuticals import in Ethiopia (2009-2019).*



*Note.* Adapted from "Trends and Challenges in Access to Essential Medicines in Ethiopia and the Contributions of Local Pharmaceutical Production" by T. Marew, F. J. Richmond, A. Belete, and T. Gebre-Mariam, 2022, *Ethiopian Journal of Health Sciences*. Copyright 2022 by Tesfa Marew, et al.

According to Gamil (2020), the type of organization, whether public or private, centralized or decentralized, autonomous or semi-autonomous, determines the procurement system or model. Private businesses in Ethiopia import products directly from their sources and distribute them to wholesalers, who in turn sell to retailers or through direct sales. These private importers also supply EPSS in cases where EPSS purchases locally from importers and local manufacturers through National Competitive Bids (NCB).

The Ethiopian Food and Drug Administration (EFDA) is responsible for ensuring the safety, efficacy, and quality of medical equipment, food, cosmetics, and pharmaceuticals, and it reports to the Ministry of Health, as stated by the EFDA. It was established by the Ministerial Council of Ministers Regulation No. 189/2010, which repealed the Drug Administration and Control Proclamation 176/1999, and officially started operating on July 17, 2010, with funding from the Ethiopian government. The EFDA is mandated under Proclamation 661/2009 of the Food, Medicines, and Healthcare Administration and Control. The Ethiopian Food and Drug

Administration (EFDA) has issued Importer licenses to over 1,472 companies in Ethiopia so far. However, not all of these companies actively import or renew their licenses to remain in business. Based on the response of the interviews with EFDA staffs, EFDA updates the list of importers as they renew their licenses annually.

### **1.1.1 Background of EPSS (Ethiopian Pharmaceuticals Supply Service)**

EPSS, formerly known as the "major Pharmacy," was established in 1947 with a capital of 80 million birr, as reported by the Ethiopian Pharmaceuticals Supply Service (n.d.). The military dictatorship in 1976 restructured the organization, which later merged with similar-functioning organizations to form the Ethiopian Pharmaceutical and Medical Supplies Corporation (EPHARMECOR). To address the shortage of pharmaceutical supplies, the transitional government reorganized EPHARMECOR into a new entity called Pharmaceutical and Medical Supplies Importer and Wholesale Distributor, which was later renamed PHARMED. In 2007, PHARMED was re-established with a revised vision, mission, and objectives under the name "Pharmaceutical Fund and Supply Agency" by Proclamation No. 553/2007, taking industry developments into account. In early 2019, the agency changed its name again to "Ethiopian Pharmaceuticals Supply Agency (EPSA)," which was later modified to its current name, Ethiopian Pharmaceutical Supply Service (EPSS).

EPSS has a widespread presence throughout Ethiopia with 19 branches, and its organizational structure is composed of four Deputy Director Generals (DDGs) and 20 Directorates, according to Oliab (2021). In accordance with the interviews held in EPSS, the Inbound DDG's Office consists of four Directorates, including the Quantification and Market Shaping Directorate (QMSD), Tender Management Directorate (TMD), Legal Service Directorate, and Contract Management Directorate (CMD). The Inbound DDG's Office ensures that essential health commodities are appropriately planned, procured from both domestic and international markets, and delivered to the warehouse, except for local consignments, which are directly delivered to the warehouse by the manufacturers. TMD is responsible for efficiently managing purchases, selecting suppliers, and conducting bids.

The EPSS Directorate, like other public procurement organizations, must follow the standard procurement procedures and comply with the established guidelines of EPSA, the PPA (Public Procurement and Property Authority), and other relevant bodies, to avoid any constraints, as pointed out by Oliab (2021). As a public agency of the Federal Republic of Ethiopia, EPSS is

bound by the legal framework of the public procurement regulations concerning its procurement and contract administration activities (Seifu & Solomon, 2020).

## **1.2 Statement of the problem**

Ethiopian Pharmaceuticals Supply Service has been providing pharmaceuticals, laboratory reagents, medical equipment, and supplies to various parts of Ethiopia for over seventy years under different names (Ethiopian Pharmaceuticals Supply Service, n.d.). According to interviews held within the private and public sector, private importers have been supporting this institution in the supply of pharmaceuticals for products that were not being supplied by EPSS based on the procurement list of the organization for public institutions and as for the private health facilities with no boundaries. It is also indicated by Stentoft and Vagn (2012), the private sector provides many of the commodities and services that the public sector supplies.

The Ethiopian medical market is best known for stock-outs, exaggerated prices on medicine and supplies, sudden increases in prices, low quality, and low durability (in the case of medical equipment). According to Federal Democratic Republic of Ethiopia Ministry of Health (2017) in the majority of the examined regions/city administrations in Ethiopia, the median availability percentage of drugs for non-communicable illnesses was extremely low (50%), with total stock out duration of 19.6 to 26.6 days. Similar to this, it was discovered that there was a low availability (54.55%) of medications used to treat chronic conditions like diabetes, hypertension, and mental problems. The government and various stakeholders in the sector have taken various measures to facilitate the international procurement process and imports. Some of these measures include an online system for new product registration, market authorization, importing licenses, import permit certificates, clearing imported items at the port, and more. In addition, guidelines and mobile phone applications are available for the different services given and to capture adverse events in the sector (Ethiopian Food and Drug Authority, n.d.). Despite the various measures taken, the problem has persisted signifying the existence of other issues that affect international pharmaceutical procurement.

According to Bekele et al. (2020), Stock-outs result from both excess and insufficient inventory, both of which waste resources. This implies that continuous procurement is inevitable and the procurement needs to be as efficient as possible in terms of quality, quantity, price, source, and time of delivery which are the strategic objectives of procurement.

Currently, EPSS, a public institution, purchases pharmaceuticals with tenders. These tenders allow the company to buy the lowest price offer from the bidders that comply with the legal documentations required. On the other hand, private importers purchase based on agreements with a selected supplier of their choice that the company believes is best fit to supply the requested supply with a better price and quality that can compete in the local market. Throughout the process, many factors affect the procurement process of these importers and distributors. These factors influence the procurement process to result in an advantage or a disadvantage in the local access to medicines, medical equipment, and other medical supplies.

The current procurement issues are a result of factors that include procurement process issues, demand forecasting problems, the relationship between international suppliers and importers, supplier selection, and foreign currency issues. Understanding which factors have a higher effect on each of the institutions gives access to figure out where the problem lies and minimize the effects of the factor to make international pharmaceutical procurement better. By unraveling the effects of these factors on the public and private importers it is possible to fill the gaps and take action on the evident stock outs, excessive pricing, low-quality products, low durability of medical equipment, and more.

Amemba et al. (2013) suggest that there is a requirement for collaboration between the public and private sectors to achieve a better comprehension of each other's issues and requirements. As the international procurement method of public and private importers is quite different, it is important to analyze and understand the different effects of the factors that influence the procurement for the two sectors of international pharmaceutical import to take lessons from each other and cooperate. Therefore, it is crucial to understand the effect of these factors on the procurement of pharmaceutical products.

### **1.3 Objectives of the Study**

#### **1.3.1 General objective**

The general objective of the study is to examine the factors affecting international pharmaceuticals procurement in Ethiopia in the private and public sectors (EPSS).

### **1.3.2 Specific objective**

1. To examine the effect of supplier selection on international pharmaceutical procurement in EPSS and private importers.
2. To determine the effect of procurement procedure on international pharmaceutical procurement in EPSS and private importers.
3. To examine the effect of buyer-supplier relationships on international pharmaceutical procurement in EPSS and private importers.
4. To analyze the effect of demand forecasting on international pharmaceutical procurement in EPSS and private importers.
5. To examine the effect of foreign currency on international pharmaceutical procurement in EPSS and private importers.
6. To analyze the difference in significance of the factors between the public (EPSS) and private sectors.

### **1.4 Significance of the Study**

According to the WHO (2007) report, an effective procurement process ensures that the appropriate medications are available in the correct quantity, at the right time, for the appropriate patients, at fair prices, and in accordance with recognized quality standards. Therefore, understanding the factors that influence the major suppliers of pharmaceuticals in Ethiopia can help the public and private sectors of pharmaceuticals supply in figuring out where the problems lie and take remedial measures for the compromise in the quality, quantity, source, time, and price of pharmaceutical products. In addition, the two sectors of pharmaceutical supply can learn from each other in areas where one has a bigger advantage over the other.

It is generally accepted that the performance of health systems and the distribution of health products cannot be improved by implementing a "one-size-fits-all" strategy. As a result, policymakers are encouraged to adopt a problem-driven approach to identify and resolve the root causes of issues in their pharmaceutical supply and procurement systems (Seidman and Atun, 2017). Therefore, studying the factors that affect the procurement sector can be of an advantage as it lets the private and public pharmaceutical procurement sectors figure out where the major influence comes from so that they can be worked on for a better international pharmaceutical procurement. This research pinpoints the source of challenges and opportunities in the sector and the factors that affect the procurement process within the public and private sectors. This, in turn, minimizes the frequent stock outs, exaggerated prices on medicine and supplies, sudden increase

in prices, and low quality and durability of the medical equipment purchased as it encourages appropriate policies to be made and measures to be taken.

Finding out the factors that best influence international pharmaceutical procurement and making institutional decisions in the public and private sector accordingly helps in the availability of good quality medical products in hospitals, pharmacies, and other health facilities which will facilitate the health sector provision. Patients will also get access to the prescribed medicines and diagnosis in time, at a fair price, and in higher quality.

### **1.5 Scope of the Study**

EPSS is a public organization that is designated in the purchase and supply of pharmaceutical products from its approved pharmaceuticals list. This procurement of pharmaceuticals to be supplied throughout the country takes place in the head office. Thus, this study is limited to the head office of the organization located in Addis Ababa, Ethiopia, Addis Ketama Subcity in front of Paulos Hospital.

The focus of this study is on the private pharmaceutical suppliers who are currently engaged in international procurement those of which have renewed their import licenses in the year of the data collection (research), as listed by the EFDA. Importers that are active only in the purchase from local manufacturers and those who have the licenses but are not actively importing are excluded from this study to limit the area of study and since the factors that affect international pharmaceutical procurement may have different impacts on local purchases.

This study will only cover the five factors that affect international pharmaceutical procurement that is listed in the conceptual framework of this research paper concerning the five rights of procurement which are product quality, quantity, place (source), time, and price.

This study will focus on the analysis of the factors influencing international pharmaceutical procurement after the implementation of the single window concept in 2020. This is mainly aimed at minimizing the number of additional factors that have the potential to influence pharmaceutical procurement and to create a common comparison ground for the private and public sectors.

## **1.6 Limitations of the Study**

The outcomes of this study must be seen in the light of some limitations. The first limitation that is worth mentioning, is the limitation of the study on the private imports that have renewed their import licenses in the year of data collection, which may not be inclusive to those which have renewed their licenses after the data collection process.

Despite the fair availability of studies in the pharmaceutical procurement area and the factors that influence the sector, much of the recent works of literature are purchasable. Therefore most of the related literature reviewed in this study is not as recently published as they are expected to be. This is one of the core reasons for the focus of this study on primary data or questionnaires.

## **1.7 Organization of the Study**

The research is generally divided into five chapters. The background of the study is presented in the first chapter. This is followed by the statement of the problem, the general and specific objectives, the research questions, the significance of the study, the scope of the study, its limitations, the definition of concepts, the study's organization, and finally the definition of terms.

The second chapter covers a survey of the theoretical and empirical literature, as well as the conceptual framework. The third chapter presents the study's methodology, which includes an introduction, sources of data, research design, research approach, population and sampling procedures, description of variables and their measurements, Model specification, data processing and analysis, reliability and validity followed by ethical issues. Data analysis, Interpretation, and Discussion of results are covered in chapter four. The study's Summary of findings, Conclusion and Recommendation are provided in the fifth and final chapter. References and appendices are provided at the end.

## **1.8 Definition of terms**

**Procurement:** every activity involved in obtaining goods and services a company needs to support its daily operations, which may include sourcing, negotiating agreements, buying goods, receiving them, doing any necessary inspections, and maintaining records of all the steps in the process (Oracle NetSuite, 2021).

**Pharmaceutical:** a substance used in the diagnosis, treatment, or prevention of disease and for restoring, correcting, or modifying organic functions (Britannica, n.d.).

**Lead time:** the first effort to initiate the acquisition of goods or services, up to the time of their arrival (TechTarget, n.d.).

**Sock-out:** The complete absence of the medicine, health product or vaccine at the point of service (WHO, 2016).

## CHAPTER TWO

### RELATED LITERATURE REVIEW

#### 2.1 Theoretical literature

Public procurement has only recently been the focus of extensive academic investigation, despite its long history and large scale. The impact of public procurement on the distribution of economic activity and the supply linkages between the private and public sectors, as well as the tendering and contracting processes, are two of the topics that have been covered in public procurement research (Brammer & Walker, 2011).

One of the primary principles of procurement is to take into account the total cost of ownership. This involves not only the initial purchase price but also the expenses and time involved in acquiring ownership. Having a clear understanding of the procurement process can help in comprehending the actual expenses connected with acquiring any product or service (Bailey et al., 2004).

According to Seifu et al. (2020), the time between placing a purchase order (PO) and the delivery of goods by a chosen supplier to the warehouse is known as the "lead time," typically measured in days or months. However, in the case of the Ethiopian Pharmaceuticals Supply Service (EPSS), the term "lead time" refers to the duration between when the Quantification and Market-Shaping Directorate (QMSD) submits a procurement request to the Tender Management Directorate (TMD) and when the products are received at EPSS's warehouses. Lengthy lead times can disrupt the supply chain, leading to reduced availability and higher prices of products.

The Ethiopian Federal Government Procurement and Property Administration Proclamation, PROCLAMATION NO. 649/2009, outlines the methods by which public bodies in Ethiopia can procure supplies. Article 33 of the proclamation specifies six methods that may be employed, but only under certain circumstances as described within the article. EPSS adheres to these guidelines for their purchasing activities. Private enterprises, on the other hand, are permitted to purchase supplies directly from foreign manufacturers without having to go through a bidding process. It should be noted that, with the exception of certain circumstances outlined in the Proclamation, public bodies are required to use open bidding as the preferred method of procurement. The methods of procurement and the conditions for their implementation include

Open Bidding, Request for Proposals, Two-stage Tendering, Restricted Tendering, Request for Quotation and Direct Procurement.

Open Bidding is a method of procurement that can be an NCB (National Competitive Bid) or ICB (International Competitive Bid), which is employed whenever national open bidding cannot produce efficient competition unless foreign enterprises are invited to bid on the project. Request for Proposals is a method used when a public entity intends to purchase consulting services or contracts in which the consulting services component represents more than half of the contract's value. The other method of procurement, Two-stage Tendering is practiced in conditions where it is not feasible for the public body to formulate detailed specifications for the goods or works, when a public body desires to sign a contract for development, study, experimentation, or research, when bid proceedings are initiated but no bids are submitted as a result of the nature of the object of the procurement or due to the technical character of the required goods, works, and nature of consultancy. Restricted Tendering is a procurement technique that is put to use when the number of suppliers to whom the invitation to bid is sent shall be such that it is sufficient to ensure effective competition and shall not as far as possible be less than five competitors. Request for Quotation can be employed when the value of a contract is within the limit set in the procurement directive to be released by the Minister. Public bodies are allowed to use requests for quotations to procure goods that are easily accessible or to procure works or services for which there is an established market. The other method which is used by public organizations like EPSS is Direct Procurement, which is used when competition is absent or there is only one candidate, for additional deliveries of goods by the original supplier, when there are additional works which have been not included in the initial contract, when new projects are just repetitions of earlier, related projects that are part of a larger undertaking and for which the initial contract has been awarded through open or restricted bidding, for continuation of consultant services and in conditions where the head of the government agency has judged that there is an urgent need, and delaying would have catastrophic consequences.

In the private sector, the process of procurement may differ from one company to another. Nevertheless, some commonalities exist within these companies. The common process for ordering within the procurement process in the private sector follows from when Purchase orders are received and checked for correctness and approval by an authorized person. Proforma Invoices are invited from potential suppliers in the Proforma request form through e-mail, fax & telephone if necessary to get a prompt response (by using Request for Proforma Invoice). After

receipt of the Proforma Invoice from the supplier it is compared with previous offers and necessary negotiations are carried out to get the best offer, after which the Proforma Invoice is accepted and approved by a higher authority for further processing. Following the approval of the Proforma Invoice, Purchase Order is prepared and signed by the concerned person and sent directly or electronically applied to EFDA for approval (by using Purchase Order). Follow-up action is initiated by Regulatory to get approval from EFDA. Subsequently, the purchase order is released and communicated to the selected supplier as per terms stated in the purchase order through fax, Telephone, or email. In the meantime, PI & PO is sent to the bank for foreign currency application. The purchase order that contains only a list of items & quantity shall be distributed with updated Goods in transit to top management and the concerned department (Tsegaw, 2022).

It is indicated in Stentoft and Vagn (2012) that public sector procurement is subject to stronger and more diverse demands than private sector procurement when comparing the two types of procurement. Even so, despite the fact that conditions in the two sectors are very different, many of the goods and services that are purchased and produced by the public sector might be provided by the private sector.

## **2.2 Empirical literature**

In addition to causing disruptions in the supply chain, long lead times can decrease the availability of products and increase their prices. Poor procurement performance can also impede growth, resulting in delivery delays, an increase in errors, and the delivery of substandard goods or no delivery at all (Ali, 2016).

Based on the context of this study, some factors affect international pharmaceutical procurement. Researchers have studied different factors that affect procurement, procurement performance, and procurement process within or outside the pharmaceutical sector. Some of the factors that are covered in this research include supplier selection, procurement procedure, buyer-supplier relationship, demand forecasting, and foreign currency.

### **Supplier selection**

In numerous procurement scenarios, the relationship established with a supplier is often intertwined with the economic aspect of organizational purchasing. This implies that when multiple supplier bids are comparable, the purchasing agent may choose the vendor with whom the company has the best relationship (Herbig & O'Hara, 1996). This cannot be the case with

EPSS as the procurement process is governed by the Ethiopian Federal Government Procurement and Property Administration Proclamation.

Ali, S. H. (2016) suggests that the procurement function can significantly enhance its performance by conducting supplier evaluations before selecting them. The selection process for a new supplier is typically divided into five stages: recognizing the need for a new supplier, determining and defining the decision criteria, prequalification, selecting the final supplier, and monitoring the process.

In researching purchasing and supply chain management, it has been noted that having the appropriate tools is essential for effectively monitoring and managing a company's supply network. Performance evaluations for suppliers can be measured through various metrics, such as delivery performance, quality performance, and cost reduction. Additionally, a supplier's overall delivery performance can be determined by factors such as quantity, lead time requirements, and due-date compliance. It is crucial for companies to prioritize these performance measurements to ensure the success and efficiency of their supply chain (Moncska et al., 2010).

To effectively monitor selected suppliers, it is advisable to use a procedure that considers various aspects such as product quality, service reliability, delivery timelines, and financial viability. Moreover, research indicates that the concept of "traceability" is a critical element of quality assurance. This involves the ability of the manufacturer of the final product to trace the ingredients back to their original producers, and the supplier's ability to transparently trace the product to the manufacturer of the finished product (WHO, 1999).

A study conducted on the supply chain system in Pakistan suggests that when selecting a supplier, factors such as the quality of their services, adherence to delivery schedules, reputation in the market, level of experience, financial stability, and registration with a governing body as an authorized supplier should be taken into consideration (Malik et al., 2022). Therefore, an organization should have a system to evaluate the suppliers before selecting them for purchase.

### **Procurement procedure**

The second factor in consideration is the procurement procedure. An effective public procurement system is essential for the growth of African nations, and real efforts should be made to make the best use of available public resources (Kabaj, 2003).

Numerous studies demonstrate that inadequate procurement performance in the private sector results in financial losses due to the supply of substandard materials, value for money erosion, and inflated prices (Ali, 2016). To establish effective quality control procedures and processes, proactive private companies engage in direct communication with their suppliers (Moncska et al., 2010).

According to a study conducted on Awasa Textile Share Company, the perception of procurement is influenced by several factors, including the existing organizational structure, the effectiveness of the internal communication system, prior experience, and available resources. It is essential to have well-designed and efficient procurement procedures to achieve government policy objectives (Ali, 2016). These procedures give staff members instructions on how to carry out activities. Impose limitations on behavior and demonstrate how the procurement department should operate to meet strategic goals (Moncska et al., 2010).

The primary activity that prepares the ground for subsequent procurement actions in procurement planning (Basheka & Mugabira, 2008). Which is and should be part of the procurement procedure of a company.

Ali's (2016) study on Awassa Textile Company highlights the negative consequences of ineffective procurement planning. Delays in contracts, increased expenses, and a lack of fair competition are some of the outcomes of inflexible and bureaucratic procurement procedures, which can ultimately harm the procurement process.

Irrespective of the procurement and distribution system used, it is crucial to establish efficient procedures for selecting cost-effective essential medications to treat common illnesses, determining the required quantities, identifying potential suppliers, managing procurement and delivery, ensuring the quality of products, and monitoring the performance of both suppliers and the procurement system (WHO, 1999). The inability to meet the objective in any of these important factors leads to a lack of access to pharmaceutical products and waste.

### **Buyer-supplier relationship**

Amemba et al. (2013) wrote that the relationship between buyers and suppliers have become the cornerstone of economic activity in the contemporary world, and are a crucial element in organizational performance, competitiveness, and sustained commercial success.

According to this study, trust plays a crucial role in exchange relationships. It helps to reduce transaction costs, minimize the possibility of opportunistic behavior, promote long-term thinking, increase interest in exploiting future economic opportunities, and facilitate cooperative transactions. It is also stated in a related study that strong commitment, communication targeted at achieving shared goals, and the presence of mutual trust with interdependence between buyers and suppliers are all essential components of a productive buyer-supplier relationship (Kimario, 2021).

### **Demand forecasting**

Merkuryeva et al. (2019) stated that precise prediction of demand is a significant hurdle in the pharmaceutical sector. The research also explains that the consequences of pharmaceutical product stock-outs cannot be quantified solely in financial terms. One of the most important tasks a supply chain organization can perform is forecasting future demand. The main deciding aspect is precise demand data from clients at various levels.

When demand data is delayed, incorrect, or incomplete, order management relies on assumptions and experience, which can lead to a significant reduction in inventory buffers, outdated products, and a shortage of storage space (Boche et al., 2020).

To prevent running out of some medications and having too many others, WHO (1999) suggests the procurement requirements be accurately quantified. On an estimated-quantity supply contract, suppliers are more eager to offer the lowest competitive price if they believe the estimated procurement quantities are accurate.

Forecasts that are made closer to the point of demand are likely to be more precise, whereas those made further up the supply chain tend to have greater forecasting errors. It can be challenging to accurately determine the size of a market during the product development stage, as there is often a lack of quantitative data available. Therefore, judgmental methods are more commonly used in forecasting at this stage (Merkuryeva et al., 2019).

### **Foreign currency**

When the procurement mechanism is unable to provide funds when needed, it can lead to drug shortages and inefficiencies in procurement. Foreign exchange is a significant requirement for the healthcare sector as drugs are imported at a specific capacity. As a result, it is difficult to avoid procurement-related challenges without access to adequate funds (Mogoi, 2010).

Drug ordering on demand and payment upon delivery has a significant positive impact on drug prices, stock-outs, and supplier confidence in the procurement process (WHO, 1999). In Ethiopia, to prevent an excessive drawdown of foreign currency reserves, access to foreign exchange for imports was restricted (rationed) beginning in March 2008, and by July 2008, the real exchange rate had risen even more (Dorosh et al., 2009). Due to this factor and the fluctuation along with the unavailability of foreign exchange, it has been difficult to import from foreign manufacturers. Managing the risk posed by foreign currency fluctuations is a key concern when making an international purchase. Companies frequently take action to lessen the uncertainty brought on by changing currency rates. One of the common measures to address this risk is by purchasing using U.S. Dollars (Moncska et al., 2010).

WHO (1999) mentions that the absence of sufficient funds or irregular funding patterns resulting in delayed payments can exacerbate procurement problems, as suppliers may refuse to offer credit or request upfront payments. In addition, if the procurement mechanism cannot ensure timely access to funds, drug shortages and inefficiencies in procurement may be unavoidable. The study recommends that securing access to funds when needed is essential to avoid such issues.

**The five rights of procurement / Four strategic objectives of pharmaceutical procurement/  
Five key variables of procurement**

WHO (1999) suggests that there are Four strategic objectives of pharmaceutical procurement, these strategic objectives are;

1. Procure the most cost-effective drugs in the right quantities
2. Select reliable suppliers of high-quality products
3. Ensure timely delivery to the locations where needed
4. Achieve the lowest possible total cost

Similar to the above study, the Oxford College of Procurement and Supply (n.d.) recognizes the five rights of procurement that are typically taken into account when analyzing procurement objectives and the procurement function.

## 1. Quality

In the past, the term "quality" referred to both the standards expected and the quality of the ordered goods or services. While product or service quality remains a crucial factor, modern methodology has expanded the concept of quality to include broader considerations such as the need for Total Quality Management (TQM). This involves implementing robust quality assurance programs that encompass both testing and surveillance to ensure high standards are maintained.

## 2. Quantity

To assure constant availability of the chosen products without building up surplus stock, procedures that reliably estimate procurement quantities must be in place (WHO, 1999).

## 3. Price

According to WHO (1999), to obtain the lowest total cost, procurement processes must take into account four key factors which are the actual cost of buying drugs, hidden costs resulting from substandard product quality or short shelf lives, costs associated with holding inventory at various supply system levels and operating costs and capital losses caused by management and administration of the procurement and distribution system.

## 4. Place /source

The place is used to refer to delivering goods and services to the appropriate location. The concept of place also includes the place where materials are obtained, the additional sources in the chain and the location of the customer, the location of the supply network's other operations, and the location of the procurement function.

## 5. Time

The key initial step in achieving on-time delivery is to ensure that the supplier is fully aware of the criticality of timely delivery (Aberu, 2017). Systems for procurement must guarantee the prompt supply of suitable quantities to the locations where they are required (WHO, 1999).

There have been many studies that have studied the factors affecting pharmaceutical procurement in Ethiopia, Africa, and beyond. Some of the studies in Ethiopia include Alemu (2018), who described the Factors affecting pharmaceutical procurement practices and the

availability of life-saving pharmaceuticals. The study showed that, in the practice of purchasing pharmaceuticals at Ethiopia's public hospitals, there is a positive correlation and a significant impact on procurement institutional organization, procurement staff competency, and procurement internal controls.

Another research was done on factors influencing good pharmaceutical procurement practice in the case of PFSA (Pharmaceuticals Fund and Supply Agency) (Berhie, 2017). The study revealed that lengthy lead times are caused by poor procurement practices, and of the independent variables investigated, ethics had the least significant impact.

In addition, research done in Kenya by Muhia et al. (2017) on factors affecting the procurement of pharmaceutical drugs describes the selection of drugs, procurement procedure, payment process, storage, distribution, and more.

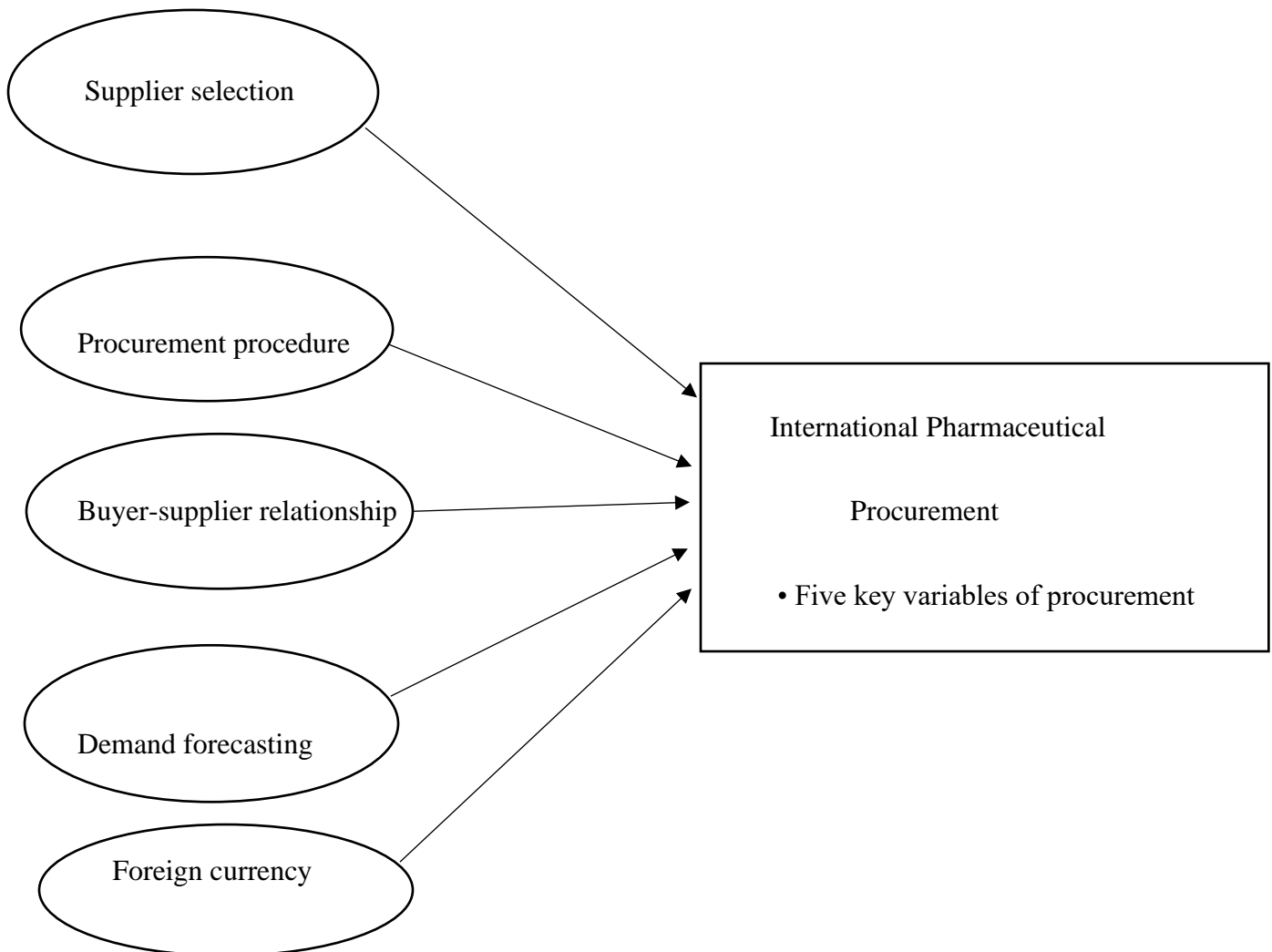
Based on the above-mentioned and other literature about pharmaceutical procurement, it is clear to see the potential factors that can affect international pharmaceutical procurement in Ethiopia. Nevertheless, most of these studies describe procurement in the public sector. This research tries to fill this gap and focuses on public and private international pharmaceutical procurement. This can help in the process of identifying the different challenges and influential factors in both the private and public sectors which can in turn benefit the system by tackling those issues and learning between the two supporting sectors of medical supply in Ethiopia can be facilitated.

### 2.3 Conceptual Framework

A conceptual framework is a collection of ideas and/or theories that serves as the study's road map and illustrates the connections between its various research variables (Mugenda, 2008).

**Figure 2. 1**

*Conceptual framework for factors affecting international pharmaceutical procurement.*



*Note.* Adapted and modified from " Factors Affecting Public Procurement Performance in Ethiopia: The Case of Public Procurement and Property Disposal Services " by A. Aberu, 2017, *Addis Ababa Research Repository*. Copyright 2018 by Addis Ababa University Libraries.

## 2.4 Hypothesis of the Study

According to De Boer et al. (2001), as the purchasing function gains more importance, the significance of purchasing decisions also increases. With organizations relying more heavily on suppliers, the negative impacts of poor supplier decision-making, both direct and indirect, become more severe.

A study on Supplier selection and assessment demonstrates the importance of supplier selection and assessment on business performance. It also mentions the greater dependence on suppliers increases the need for supplier selection and management. The common trends in the approaches for selection criteria include price, delivery, quality and service, which are routinely used (Kannan & Tan, 2002). Krop and Iravo (2016) also explain the significant effect of supplier selection on procurement performance. Therefore, the effect of Supplier selection on international pharmaceutical procurement of the private and public sector need to be tested.

H1o: Supplier selection does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

H1a: Supplier selection has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

WHO (1999) mentions how crucial it is to establish efficient procedures. In addition, Ali (2016) states the negative consequences of ineffective procurement planning.

H2o: Procurement procedure does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

H2a: Procurement procedure has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

Buyer-supplier relationship is a crucial element in organizational performance, competitiveness, and sustained commercial success (Amemba et al., 2013). It also increases sustainable competitive advantage, which in turn enhances procurement success (Loice, 2015).

H3o: Buyer-supplier relationship does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

H3a: Buyer-supplier relationship has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

WHO (1999) suggests the procurement needs be precisely measured. Moreover, Siddiqui et al. (2022) states how crucial it is to have a demand forecasting system that is as accurate and error-free as possible to have an efficient supply chain.

H4o: Demand forecasting does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

H4a: Demand forecasting has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

It is difficult to avoid procurement-related challenges without access to adequate funds (Mogoi, 2010). Several studies and reports have noted that paying for drugs upon receipt can have a considerable beneficial influence on drug costs, stock shortages, and the confidence of suppliers in the procurement process. On the other hand, procurement issues can be aggravated and payments delayed if there are insufficient funds or if funding is irregular (WHO, 1999).

H5o: Foreign currency does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

H5a: Foreign currency has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the research design and methods employed to achieve the objective of the study. It comprises the sources of data, research design, research approach, population and sampling procedures, description of variables and their measurements, data processing and analysis, reliability and validity, and Ethical issues.

#### **3.2 Sources of data**

Primary data was collected using interviews and questionnaires of the procurement staff within the public (EPSS) and private sector pharmaceutical importers. The questionnaires' are closed-ended and Likert scale was used to measure the responses to the questions.

#### **3.3 Research design**

This study has employed an explanatory research design. This design was used to show the effects of the independent variables (Supplier selection, Procurement procedure, Buyer-supplier relationship, Demand forecasting, and Foreign currency) on the dependent variable which is international pharmaceuticals procurement.

#### **3.4 Research approach**

The research adopts a quantitative research method. As Holton and Burnett (2005) put it, an in-depth and detailed understanding of a given group or sample can be attained using quantitative approaches. This research primarily uses the data collected through questionnaires to give analyzed interpretations using SPSS. The analyzed data is presented as a relationship between the independent and dependent variables. In addition, the interdependence between the dependent and independent variables will also be shown using regression and correlation analysis.

### **3.5 Population and sampling procedures**

#### **3.5.1 Population**

The target population for this particular research includes employees of EPSS and private importers. The staff members of EPSS from the three directorates; Quantification and market shaping directorate, Contact management directorate, and Tender management directorate excluding the non-technical (supporting staff). The total amount of staff members in these directorates are; 25, 43, and 25 consecutively with a total of 93. Which leaves 55 members when the non-technical members are excluded.

From the private importers, the importers that have renewed their import licenses within the year 2015 Ethiopian Calendar were the target population. Therefore the sample size of the private importers became 99 according to the list obtained from EFDA.

When data for small areas are available and we want accurate information for many subdivisions of the population a Census is used (Australian Bureau of Statistics, n.d.). Therefore, the 55 technical staff of EPSS and 99 private importers that have renewed their Pharmaceuticals import licenses were used for data collection.

#### **3.5.2 Sampling technique**

The sampling technique used is purposive sampling. In the case of EPSS the technical staff members and managers in the Tender Management Directorate, Contract Management Directorate, and Quantification and market shaping directorate were considered on the other hand from the private importers the importers that renewed their import licenses in 2015 were used to collect the data. According to Rai and Thapa (2015), when the universe is small and a known aspect of it needs to be explored in depth, purposive sampling seems to be more suited. Starting with a goal in mind, the sample is chosen to include participants who are of interest and to omit participants who are not relevant to the goal.

### **3.6 Description of variables and their measurements**

Variables are characteristics or attributes that can take on different values in a dataset. They are used to represent the data and describe the relationships between them. In statistical models, variables are used to make predictions, inferences, and conclusions. When compared to the dependent variable, the independent variable is the antecedent, and the Dependent variable is the variable that is affected by the independent variable (Kaur, 2013). The independent variables of this study include; Supplier selection, Procurement procedure, Buyer-supplier relationship,

Demand forecasting, and Foreign currency while International Pharmaceutical Procurement is the dependent variable.

Measurements of variables refer to the specific values assigned to the variables in a dataset. There are different types of measurements, including nominal (categorical), ordinal (ordered categorical), interval (numeric with equal units), and ratio (numeric with meaningful zero). The type of measurement determines the type of statistical analysis that can be performed on the variable. In this research, the independent variables are measured by using the ordinal measurement type, the Likert scale. The independent variables are measured using 5 to 6 questions in the questionnaire. The questions measure each independent variable with respect to the five rights (key variables) of procurement. The dependent variable which is expressed in terms of the five rights or key variables of procurement is also measured by considering the respondent's company's international procurement in accordance with those five objectives of procurement. The dependent variable is measured in the questionnaire using 6 questions related to the company's international procurement in terms of the key variables of procurement.

### **3.7 Model specification**

Using multiple linear regression models, the researcher looked at perceived factors that affect international pharmaceutical procurement in Ethiopia that were found in prior literature and primary data from interviews. A mathematical method known as multiple linear regression is used to model the relationship between numerous independent predictor factors and a single dependent outcome variable (Marill, 2004). The independent variables are; Buyer-supplier relationship, Supplier selection, Procurement procedure, Demand forecasting, and Foreign currency, and the dependent variable; International Pharmaceuticals Procurement. Therefore, the multiple linear regression model becomes;

$$IPP = \beta_0 + \beta_1 BSR + \beta_2 SS + \beta_3 PP + \beta_4 DF + \beta_5 FC + \varepsilon$$

Where; IPP: International Pharmaceuticals Procurement,  $\beta_0$ : Constant

$\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$ , and  $\beta_5$ : Slope of Buyer-supplier relationship, Supplier selection, Procurement procedure, Demand forecasting, and Foreign currency respectively.

BSR: Buyer-supplier relationship

SS: Supplier selection

PP: Procurement procedure

DF: Demand forecasting

FC: Foreign currency

$\epsilon$ : Standard Error

### **3.8 Data Processing and Analysis**

#### **3.8.1 Data processing**

Data processing is the series of steps involved in transforming raw data into useful information. This may involve cleaning and transforming the data, combining data from multiple sources, and creating new variables that better represent the data. Data processing is an important part of data analysis and is essential for generating accurate and meaningful insights from the data. This study used IBM SPSS (Statistical Package for the Social Sciences) version 25 for quantitative data analysis.

#### **3.8.2 Data analysis**

For this research, the data collected through questionnaires were arranged and analyzed. To summarize the percentage and frequency tables; descriptive statistics like mean and standard deviation; to assess the effects of the dependent variables, inferential statistics like correlation and regression were used.

### **3.9 Reliability and Validity**

#### **3.9.1 Reliability**

The consistency, stability, and repeatability of the informant's stories, as well as the investigators' capacity to gather and record information effectively, are all factors that contribute to reliability. It speaks to a study method's capacity of repeatability to produce the same outcomes repeatedly during testing periods. It demands that a researcher used identical or comparable techniques and consistently produced identical or comparable results when applying those techniques to identical or similar participants (Brink, 1993). When creating attitude scales and surveys, Cronbach's Alpha is highly helpful because it shows whether the items are measuring the same construct by indicating the alpha level (or reliability). Cronbach's alpha is used to know the correlation among factors that constitute the scale and have an acceptable coefficient of '0.7' the more reliable the data the higher the coefficient of Cronbach's alpha value (Robert & Richard,

2008). It is possible to identify and remove items that are not measuring the same thing as the others.

### **3.9.2 Validity**

The validity of scientific discoveries is concerned with their veracity and accuracy. A valid study should show what is true, and an accurate instrument or measure should reflect what it is intended to reflect (Brink, 1993). This study used pilot testing to check the validity of the content in the measuring instrument to modify, change and reword the first drafts. Experts in the procurement practice were used in the pilot testing process.

### **3.10 Ethical issues**

An assistance letter was obtained from the Addis Ababa University College of Business and Economics Department of Management Post Graduate Coordination Office to get permission from EPSS Managements, EFDA, and private importers. The participants of the interview and questionnaires are aware of their role in the data collection process and are given the right to not participate. The confidentiality of the responder's response is kept and the data collected will only be used for the fulfillment of the research study. The responses gathered are used and analyzed directly without any modification by the researcher.

## **CHAPTER FOUR**

### **DATA ANALYSIS, INTERPRETATION, AND DISCUSSION OF RESULTS**

#### **4.1 Introduction**

This study's major goal is to investigate the variables influencing private and public importers' purchases of imported pharmaceuticals in Ethiopia. The information acquired from the sample population through surveys is presented in this chapter as the findings. The Likert scale was used in the questionnaire design to allow respondents to indicate how much they agree or disagree with each of the statements made for each of the variables. The replies were entered into SPSS (Statistical Package for the Social Sciences) for coding and analysis, which produced tabular and figurative outputs that were later analyzed and interpreted. Frequency tables, means, and standard deviation are the main presentation formats for the data.

#### **4.2 Response rates**

The total sample size for the public pharmaceutical importer EPSS within the three departments that are directly concerned with the research of interest were 55. Out of the 55 questionnaires' distributed, 48 were returned and none of the returned questionnaires were rejected. On the other hand, from the private importers with a total sample size of 99, 86 were returned. Due to poor data quality, 5 were rejected. According to Phillips et al. (2017), response rate is the number of people who responded divided by the total number of potential respondents. Simple expressed as;  $\text{Respondents} / (\text{Nonrespondents} + \text{Respondent})$ . While we shouldn't anticipate a complete response in studies where participation is voluntary, researchers that use questionnaires strive for a high Response Rate (Baruch & Holtom, 2008). The 48 questionnaires from EPSS and 81 from the Private importers were valid with a response rate of 87.3% and 81.8% respectively.

#### **4.3 General information and demographic background of respondents**

The general information and demographic background of respondents includes the Gender, Relevant work experience, Educational qualification, which department the respondent is working in and the designation of the respondent within the department. This information is important to assess the competence of the responder to answer the questions with in the questionnaire and better analyze the data.

### 4.3.1 General information and demographic background of respondents in EPSS

**Table 4.1**

*General information and demographic characteristics of the study participants in EPSS, (n=48).*

	<b>Characteristic</b>	<b>Frequency</b>	<b>Percent</b>
Gender	Male	43	89.6
	Female	5	10.4
Relevant work experience	Less than 5 years	21	43.8
	5-10 years	21	43.8
	10-15 years	3	6.3
	More than 20 years	3	6.3
Educational qualification	Diploma	1	2.1
	First Degree	33	68.8
	Second Degree	12	25.0
	Above second Degree	2	4.2
Departments	Tender Management Directorate	11	22.9
	Contract Management Directorate	27	56.3
	Quantification and Market Shaping Directorate	9	18.8
	Other	1	2.1
Designation within the department	Coordinator	11	22.9
	Senior expert	18	37.5
	Junior staff	19	39.6

Source: Survey data, 2023.

From the 48 responders of the public importer (Ethiopian Pharmaceuticals Supply Service), 45 (89.6%) are Male while the remaining 5 (10.4%) were Female. Suggesting the existence of male dominance in the public procurement process.

From the 48 responders, the number of employees from the three departments which have a direct involvement in the international purchase of pharmaceuticals that actually have more than 10 years of experience are only 6 (12.6%). The remaining 42 (43.8%) are of lower than 10 years of experience with in the sector. This suggests that there is higher turnover within the organization given the year the organization was established.

The educational qualification within respondents from EPSS is summarized in Table 4.1. It indicates that 33 (68.8%) have an educational level of first degree and below and 14 (29.2%) have a second degree or above educational level. This implies that the respondents are well educated and qualified for the job as well as to respond to the questionnaires of this study.

The number of responders with in the three departments under investigation were 11 (22.9), 27 (56.3) and 9 (18.8) for the Tender Management, Contract Management and Quantification and Market Shaping directorate respectively. Five of the questionnaires which were not responded are from the Quantification and Market Shaping directorate, while the remaining two were from the Tender and Contract Management directorate (one from each) due to unavailability of the directors.

As displayed in Table 4.1, only 19 (39.6) of the responders are at a junior position, while the remaining 60.4% are senior experts and at a coordinator position. None of the responders where from the director position, as the Directors with in the three departments were not available to respond the questionnaires.

### 4.3.2 General information and demographic background of respondents from Private Importers

**Table 4.2**

*General information and demographic characteristics of the study participants in Private importers, (n=81).*

	<b>Characteristic</b>	<b>Frequency</b>	<b>Percent</b>
Gender	Male	50	61.7
	Female	31	38.3
Relevant work experience	Less than 5 years	26	32.1
	5-10 years	37	45.7
	10-15 years	13	16.0
	15-20 years	4	4.9
	More than 20 years	1	1.2
Educational qualification	First Degree	53	65.4
	Second Degree	26	32.1
	Above second Degree	2	2.5
Departments	Other	81	100.0
Designation within the department	Director	21	25.9
	Coordinator	24	29.6
	Senior expert	24	29.6
	Junior staff	12	14.8

Source: Survey data, 2023

From the 81 valid responses of the private importers, 50 (61.7%) are Male while the remaining 31 (38.3%) being Female. This suggests that there is better involvement of female in the private sector than the public.

The experiences of the staffs in the private importers of pharmaceuticals is as shown in Table 4.2. The staff members that have more than 10 years of experience are 18 (22.1%), implying the involvement of more experienced staff in the private sector than the public with in the pharmaceutical procurement.

As summarized in Table 4.2, the educational qualification with in respondents of private importers indicates that 53 (65.4%) have first degree education and 28 (34.6%) have a second degree or above educational level. Similar to the public importer EPSS, this implies that the respondents are well educated and qualified for the job as well as to respond to the questionnaires of this study while the private sector showing better educational qualification than the public sector.

The private sector importers have a different way of naming departments within the procurement process, therefore the responders selected the others option while mentioning the department to which they belong (if they belong to any or have any departmental divisions). This also strengthens the responses in the interviews that many responsibilities within most of the private importers are taken care of by a single or a few employees (owners) hence not giving space for any departmental divisions or sharing of responsibilities.

As displayed in Table 4.2, only 12 (14.8%) of the responders are at a junior position, while the remaining 85.1% are senior experts, a coordinator and at a managerial position (Director). Therefore, it is evident that in both the public and private sectors knowledgeable and experienced respondents could comprehend the issues with procurement-related activities and provide adequate information that could support the validity of this study.

#### **4.4 Reliability Analysis**

The five constructs representing the independent variables; **Buyer-supplier relationship, Supplier selection, Procurement procedure, Demand forecasting and Foreign currency** and the dependent variable (**International Pharmaceuticals Procurement**) measured in terms of the five key variables of procurement recorded a Cronbach's alpha statistics of more than 0.7 in both private and public importer (EPSS). According to Taber (2018), an acceptable value for Cronbach's Alpha is generally considered to be 0.70 or higher, therefore the variables scored a Cronbach's value within the acceptable rage. The reliability statistics for the private and public importer (EPSS) are presented in Table 4.3.

**Table 4.3**

*Reliability test results: Cronbach's Alpha values for EPSS, (n=48).*

Variables	N items	Cronbach's Alpha
<b>Buyer-supplier relationship</b>	6	0.703
<b>Supplier selection</b>	6	0.785
<b>Procurement procedure</b>	5	0.772
<b>Demand forecasting</b>	5	0.705
<b>Foreign currency</b>	5	0.853
<b>International Pharmaceuticals Procurement</b>	6	0.709

Source: Survey data, 2023.

**Table 4.4**

*Reliability test results: Cronbach's Alpha values for private importers, (n=81).*

No.	Variables	N items	Cronbach's Alpha
	<b>Buyer-supplier relationship</b>	6	0.723
	<b>Supplier selection</b>	6	0.746
	<b>Procurement procedure</b>	5	0.728
	<b>Demand forecasting</b>	5	0.703
	<b>Foreign currency</b>	5	0.809
	<b>International Pharmaceuticals Procurement</b>	6	0.763

Source: Survey data, 2023.

#### **4.5 Descriptive Statistics**

Table 4.5 is intended to simplify the interpretation of the results of the means and standard deviations, the scales were reassigned in the following manner (Al-Sayaad et al., 2006, as cited in Ditta, 2022).

**Table 4.5**

*Scoring range of Likert scale of the survey.*

	<b>Value</b>	<b>Range</b>
Strongly Disagree	1	1.00-1.80
Disagree	2	1.81-2.60
Neutral	3	2.61-3.40
Agree	4	3.41-4.20
Strongly Agree	5	4.21-5.00

*Note.* Adapted from " Factors influencing the Internationalization of Firms: Case of Addis Ababa City Exporters " by H. Ditta, 2022, *Addis Ababa Research Repository*. Copyright 2018 by Addis Ababa University Libraries.

#### **4.5.1 Response summary on Buyer- supplier relationship related questions.**

**Table 4.6**

*Response summary on Buyer- supplier relationship related questions with in EPSS and private importers.*

		EPSS		Private importers	
		Count	Column N %	Count	Column N %
There is a cost cutting strategy available with our suppliers.	Strongly disagree	0	0.0%	2	2.5%
	Disagree	4	8.3%	5	6.2%
	Neutral	7	14.6%	18	22.2%
	Agree	27	56.3%	41	50.6%
	Strongly agree	10	20.8%	15	18.5%
The terms of delivery the suppliers offer us is beneficial to our company.	Strongly disagree	0	0.0%	2	2.5%
	Disagree	5	10.4%	2	2.5%
	Neutral	8	16.7%	13	16.0%
	Agree	25	52.1%	41	50.6%
	Strongly agree	10	20.8%	23	28.4%
Our organization has priorities in high demand products.	Strongly disagree	0	0.0%	2	2.5%
	Disagree	5	10.4%	3	3.7%
	Neutral	12	25.0%	1	1.2%
	Agree	24	50.0%	36	44.4%
	Strongly agree	7	14.6%	39	48.1%

Ordered items are delivered to the delivery place on time.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	8	16.7%	20	24.7%
	Neutral	11	22.9%	15	18.5%
	Agree	24	50.0%	37	45.7%
	Strongly agree	5	10.4%	9	11.1%
The suppliers are open when there is un favorability or quality issue of their products and they communicate it with our company.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	3	6.3%	5	6.2%
	Neutral	9	18.8%	6	7.4%
	Agree	30	62.5%	42	51.9%
	Strongly agree	6	12.5%	28	34.6%
Our suppliers always supply the right quantity of products.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	12	25.0%	8	9.9%
	Neutral	11	22.9%	3	3.7%
	Agree	19	39.6%	32	39.5%
	Strongly agree	6	12.5%	38	46.9%

Source: Survey data, 2023.

**Table 4.7**

*Descriptive statistics on Buyer- supplier relationship related questions with in EPSS and private importers.*

s.no	Buyer-supplier relationship-related questions.	EPSS		Private importers	
		Mean	Standard deviation	Mean	Standard deviation
1.1	There is a cost-cutting strategy available with our suppliers.	3.90	0.831	3.77	0.912
1.2	The terms of delivery the suppliers offer us is beneficial to our company.	3.83	0.883	4.00	0.880
1.3	Our organization has priorities in high-demand products.	3.69	0.854	4.32	0.878
1.4	Ordered items are always delivered to the delivery place on time.	3.54	0.898	3.43	0.987
1.5	The suppliers are open when there is un favorability or quality issue of their products and they communicate it with our company.	3.81	0.734	4.15	0.808
1.6	Our suppliers always supply the right quantity of products.	3.40	1.005	4.23	0.926
Mean of the means/ Standard deviations		3.695	0.868	3.983	0.899

Source: Survey data, 2023.

Table 4.6 and Table 4.7 indicate, the mean values and responses of the responders in EPSS are between the values of 3.40 and 3.90 with a standard deviation value between 0.734 and 1.005. The staff agrees with the statements that explain good buyer supplier relationships with the highest score being the availability of cost-cutting strategy followed by beneficial delivery terms. On the other hand, the mean values from the responses of the private sector show a range between 3.43 and 4.23 with a standard deviation between 0.808 and 0.987. The private sector shows a slightly higher mean score than EPSS (a public importer). This difference is particularly shown in the supply of the right quantity of products, with a response percent of 46.9% for “Strongly agree” in the private while EPSS staff strongly agreed with the statement with only 12.5%. The average of the means indicate that the buyer supplier relationships of private importers is slightly more positive than EPSS, as it is higher in the scoring range for the mean closer to the upper bound 4.20.

#### 4.5.2 Response summary on Supplier selection related questions.

**Table 4.8**

*Response summary on Supplier selection related questions with in EPSS and private importers.*

		EPSS		Private importers	
		Count	Column N %	Count	Column N %
Our organization has a system to evaluate the suppliers prior to engaging in business.	Strongly disagree	0	0.0%	1	1.2%
	Disagree	13	27.1%	4	4.9%
	Neutral	7	14.6%	5	6.2%
	Agree	23	47.9%	44	54.3%
	Strongly agree	5	10.4%	27	33.3%
Our organization does a market analysis prior to selecting a supplier.	Strongly disagree	0	0.0%	2	2.5%
	Disagree	11	22.9%	3	3.7%
	Neutral	10	20.8%	4	4.9%
	Agree	24	50.0%	42	51.9%
	Strongly agree	3	6.3%	30	37.0%
Most supplier’s response for prequalification documents is swift.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	9	18.8%	8	9.9%
	Neutral	19	39.6%	21	25.9%
	Agree	17	35.4%	36	44.4%
	Strongly agree	3	6.3%	16	19.8%
Our organization does a market analysis in price before selecting a supplier.	Strongly disagree	0	0.0%	1	1.2%
	Disagree	6	12.5%	2	2.5%
	Neutral	11	22.9%	2	2.5%
	Agree	25	52.1%	47	58.0%

Our organization does a market analysis in quality or specification before selecting a supplier.	Strongly agree	6	12.5%	29	35.8%
	Strongly disagree	1	2.1%	1	1.2%
	Disagree	4	8.3%	3	3.7%
	Neutral	8	16.7%	3	3.7%
	Agree	31	64.6%	44	54.3%
The geographical location of the supplier matters in the selection of suppliers.	Strongly agree	4	8.3%	30	37.0%
	Strongly disagree	0	0.0%	1	1.2%
	Disagree	16	33.3%	11	13.6%
	Neutral	11	22.9%	23	28.4%
	Agree	14	29.2%	37	45.7%
	Strongly agree	7	14.6%	9	11.1%

Source: Survey data, 2023.

**Table 4.9**

*Descriptive statistics on Supplier selection related questions with in EPSS and private importers.*

s.no	Procurement procedure related questions.	EPSS		Private importers	
		Mean	Standard deviation	Mean	Standard deviation
2.1	Our organization has a system to evaluate the suppliers prior to engaging in business.	3.42	1.007	4.14	0.833
2.2	Our organization does a market analysis prior to selecting a supplier.	3.40	0.917	4.17	0.877
2.3	Most supplier's response for prequalification documents is swift.	3.29	0.849	3.74	0.891
2.4	Our organization does a market analysis in price before selecting a supplier.	3.65	0.863	4.25	0.734
2.5	Our organization does a market analysis in quality or specification before selecting a supplier.	3.69	0.829	4.22	0.791
2.6	The geographical location of the supplier matters in the selection of suppliers.	3.25	1.082	3.52	0.910
Mean of the means/ Standard deviations		3.45	0.925	4.007	0.839

Source: Survey data, 2023.

As shown in Table 4.8 and 4.9, the responses from EPSS have lower mean in all of the items in the supplier selection factor. A sizable difference is shown in the existence of market analysis prior to supplier selection followed by evaluation of suppliers before engaging in business. 54.3% of the responders in the private sector agreed to the availability of system to evaluate suppliers while 33.3% strongly agreed. Whereas in EPSS, 47.9% agreed and 27.1% (the second highest response percentage) disagreed. This implies the lower engagement of EPSS in the supplier selection process which can be explained by the tender process of procurement within the public sector, which is guided by PROCLAMATION NO. 649/2009. In addition, the average of the means indicate that the private sector is more engaged in the supplier selection that is best fit for it as they are privately owned and do not need to follow strict tender procedures in the selection of suppliers.

#### 4.5.3 Response summary on Procurement procedure related questions.

**Table 4.10**

*Response summary on Procurement procedure related questions with in EPSS and private importers.*

		EPSS		Private importers	
		Count	Column N %	Count	Column N %
There are minimum requirements in our organization for a supplier to be considered for a procurement.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	9	18.8%	9	11.1%
	Neutral	8	16.7%	9	11.1%
	Agree	28	58.3%	46	56.8%
	Strongly agree	3	6.3%	17	21.0%
Our organization can minimize the procurement process lead time with simple modifications.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	9	18.8%	6	7.4%
	Neutral	14	29.2%	17	21.0%
	Agree	21	43.8%	52	64.2%
	Strongly agree	4	8.3%	6	7.4%
Our organization has annual procurement plan for items to be procured.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	4	8.3%	11	13.6%
	Neutral	12	25.0%	15	18.5%
	Agree	26	54.2%	32	39.5%
	Strongly agree	6	12.5%	23	28.4%
Procured items are tested or inspected by the organizations staff for missing parts or quality issues.	Strongly disagree	1	2.1%	0	0.0%
	Disagree	4	8.3%	4	4.9%
	Neutral	9	18.8%	11	13.6%
	Agree	30	62.5%	37	45.7%

	Strongly agree	4	8.3%	29	35.8%
Our organization can assist in the local registration (if not registered) of the supplier's product if the products are deemed best quality by the organization.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	15	31.3%	5	6.2%
	Neutral	12	25.0%	4	4.9%
	Agree	14	29.2%	34	42.0%
	Strongly agree	7	14.6%	38	46.9%

Source: Survey data, 2023.

**Table 4.11**

*Descriptive statistics on Procurement procedure related questions with in EPSS and private importers.*

s.no	Procurement procedure related questions.	EPSS		Private importers	
		Mean	Standard deviation	Mean	Standard deviation
3.1	There are minimum requirements in our organization for a supplier to be considered for a procurement.	3.52	0.875	3.88	0.872
3.2	Our organization can minimize the procurement process lead time with simple modifications.	3.42	0.895	3.72	0.711
3.3	Our organization has annual procurement plan for items to be procured.	3.71	0.798	3.83	0.997
3.4	Procured items are tested or inspected by the organizations staff for missing parts or quality issues.	3.67	0.834	4.12	0.827
3.5	Our organization can assist in the local registration (if not registered) of the supplier's product if the products are deemed best quality by the organization.	3.27	1.067	4.30	0.828
Mean of the means/ Standard deviations		3.518	0.894	3.97	0.847

Source: Survey data, 2023.

Based on the responses from the questionnaires, the procurement procedure item means from the EPSS and private importers show a wider difference on whether the organization can assist in the local registration showing a mean of 4.30 and 3.27 from the private and public sector respectively. This is also shown in the percentage of response as 46.9% of the private import responders agree with the statement while 31.3% (highest response percentage) of EPSS staff disagree. As shown in the mean of the means, the values of EPSS and private importers are 3.518

and 3.97 respectively implying a slight difference resulting from the items that describe whether the organization assists in the registration of products and inspection and test of products by the staff.

#### 4.5.4 Response summary on Demand forecasting related questions.

**Table 4.12**

*Response summary on Demand forecasting related questions with in EPSS and private importers.*

		EPSS		Private importers	
		Count	Column N %	Count	Column N %
Our organization has a system to quantify the needs in the society.	Strongly disagree	0	0.0%	1	1.2%
	Disagree	6	12.5%	2	2.5%
	Neutral	6	12.5%	13	16.0%
	Agree	26	54.2%	42	51.9%
	Strongly agree	10	20.8%	23	28.4%
Our organization's purchase is based on studied and quantified need.	Strongly disagree	0	0.0%	2	2.5%
	Disagree	1	2.1%	3	3.7%
	Neutral	3	6.3%	1	1.2%
	Agree	33	68.8%	36	44.4%
	Strongly agree	11	22.9%	39	48.1%
There are sudden purchases in our organization due to poor need quantification.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	5	10.4%	20	24.7%
	Neutral	10	20.8%	15	18.5%
	Agree	27	56.3%	37	45.7%
	Strongly agree	6	12.5%	9	11.1%
Emergency or sudden purchases have resulted low quality products.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	10	20.8%	5	6.2%
	Neutral	18	37.5%	6	7.4%
	Agree	13	27.1%	42	51.9%
	Strongly agree	7	14.6%	28	34.6%
Emergency or sudden purchases have resulted in increased prices in products.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	2	4.2%	8	9.9%
	Neutral	11	22.9%	3	3.7%
	Agree	24	50.0%	32	39.5%
	Strongly agree	11	22.9%	38	46.9%

Source: Survey data, 2023.

**Table 4.13**

*Descriptive statistics on Demand forecasting related questions with in EPSS and private importers.*

s.no	Demand forecasting related questions.	EPSS		Private importers	
		Mean	Standard deviation	Mean	Standard deviation
4.1	Our organization has a system to quantify the needs in the society.	3.83	0.907	4.04	0.813
4.2	Our organization's purchase is based on studied and quantified need.	4.13	0.606	4.32	0.878
4.3	There are sudden purchases in our organization due to poor need quantification.	3.71	0.824	3.43	0.987
4.4	Emergency or sudden purchases have resulted low quality products.	3.35	0.978	4.15	0.808
4.5	Emergency or sudden purchases have resulted in increased prices in products.	3.92	0.794	4.23	0.926
Mean of the means/ Standard deviations		3.788	0.822	4.034	0.882

Source: Survey data, 2023.

Table 4.12 shows that EPSS has been subjected to poor need quantification as compared to the private sector and sudden purchases have resulted. The mean of the responses indicates this with a mean score of 3.71. On the other hand responses from the private imports gives a mean of 3.43 which is still high but slightly lower than EPSS. It can also be concluded that private importers are engaged with a better need quantification system than EPSS, indicated with a mean value of 4.04 and 3.83 within the private and public sector respectively.

#### 4.5.5 Response summary on Foreign currency related questions.

**Table 4.14**

*Response summary on Foreign currency related questions with in EPSS and private importers.*

		EPSS		Private importers	
		Count	Column N %	Count	Column N %
Foreign currency fluctuation and shortage has affected the quantity of our orders.	Strongly disagree	2	4.2%	1	1.2%
	Disagree	4	8.3%	2	2.5%
	Neutral	4	8.3%	2	2.5%
	Agree	23	47.9%	27	33.3%
	Strongly agree	15	31.3%	49	60.5%
The shortage of foreign currency has made our organization purchase low quality products.	Strongly disagree	5	10.4%	3	3.7%
	Disagree	15	31.3%	30	37.0%
	Neutral	9	18.8%	17	21.0%
	Agree	15	31.3%	14	17.3%
	Strongly agree	4	8.3%	17	21.0%
The shortage of foreign currency has made our organization purchase cheaper products.	Strongly disagree	7	14.6%	3	3.7%
	Disagree	15	31.3%	30	37.0%
	Neutral	7	14.6%	10	12.3%
	Agree	15	31.3%	27	33.3%
	Strongly agree	4	8.3%	11	13.6%
The shortage of foreign currency has made our organization purchase from specific countries or limited geographical locations.	Strongly disagree	5	10.4%	1	1.2%
	Disagree	13	27.1%	18	22.2%
	Neutral	11	22.9%	8	9.9%
	Agree	15	31.3%	40	49.4%
	Strongly agree	4	8.3%	14	17.3%
The shortage of foreign currency has affected the lead time to the delivery of ordered products.	Strongly disagree	4	8.3%	0	0.0%
	Disagree	3	6.3%	6	7.4%
	Neutral	5	10.4%	3	3.7%
	Agree	18	37.5%	42	51.9%
	Strongly agree	18	37.5%	30	37.0%

Source: Survey data, 2023.

**Table 4.15**

*Descriptive statistics on Foreign currency related questions with in EPSS and private importers.*

s. no	Foreign currency-related questions	EPSS		Private importers	
		Mean	Standard deviation	Mean	Standard deviation
5.1	Foreign currency fluctuation and shortage has affected the quantity of our orders.	3.94	1.060	4.49	0.777
5.2	The shortage of foreign currency has made our organization purchase low quality products.	2.96	1.184	3.15	1.236
5.3	The shortage of foreign currency has made our organization purchase cheaper products.	2.88	1.248	3.16	1.177
5.4	The shortage of foreign currency has made our organization purchase from specific countries or limited geographical locations.	3.00	1.167	3.59	1.058
5.5	The shortage of foreign currency has affected the lead time to the delivery of ordered products.	3.90	1.225	4.19	0.823
Mean of the means/ Standard deviations		3.336	1.177	3.716	1.0142

Source: Survey data, 2023.

The responses show that the public sector is less affected by foreign currency influences than the private. It is also shown by the average mean values as the effects are lower in EPSS with a value of 3.336 and as for the private sector 3.716. This is also visible on the percentage of the responses in table 4.14.

#### 4.5.6 Response summary on International pharmaceutical procurement related questions.

**Table 4.16**

*Response summary on International pharmaceutical procurement related questions with in EPSS and private importers.*

		EPSS		Private importers	
		Count	Column N %	Count	Column N %
Procured items in my company are of the right quality.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	1	2.1%	1	1.2%
	Neutral	4	8.3%	1	1.2%
	Agree	35	72.9%	43	53.1%
	Strongly agree	8	16.7%	36	44.4%
Procured items in my company are of the right quantity.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	6	12.5%	5	6.2%
	Neutral	9	18.8%	5	6.2%
	Agree	26	54.2%	44	54.3%
	Strongly agree	7	14.6%	27	33.3%
Procured items in my company are at a low price.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	5	10.4%	14	17.3%
	Neutral	12	25.0%	29	35.8%
	Agree	25	52.1%	35	43.2%
	Strongly agree	6	12.5%	3	3.7%
Procured items in my company are from a good source/supplier.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	4	8.3%	0	0.0%
	Neutral	10	20.8%	1	1.2%
	Agree	29	60.4%	48	59.3%
	Strongly agree	5	10.4%	32	39.5%
Procured items in my company are delivered to the right place.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	3	6.3%	0	0.0%
	Neutral	10	20.8%	3	3.7%
	Agree	31	64.6%	54	66.7%
	Strongly agree	4	8.3%	24	29.6%
Procured items in my company are delivered at the right time.	Strongly disagree	0	0.0%	0	0.0%
	Disagree	14	29.2%	9	11.1%
	Neutral	11	22.9%	20	24.7%
	Agree	18	37.5%	39	48.1%
	Strongly agree	5	10.4%	13	16.0%

Source: Survey data, 2023.

**Table 4.17**

*Descriptive statistics on International pharmaceutical procurement related questions with in EPSS and private importers.*

s. no	International Pharmaceuticals Procurement related questions	EPSS		Private importers	
		Mean	Standard deviation	Mean	Standard deviation
6.1	Procured items in my company are of the right quality.	4.04	0.582	4.41	0.587
6.2	Procured items in my company are of the right quantity.	3.71	0.874	4.15	0.792
6.3	Procured items in my company are at a low price.	3.67	0.834	3.33	0.806
6.4	Procured items in my company are from a good source/supplier.	3.73	0.765	4.38	0.514
6.5	Procured items in my company are delivered to the right place.	3.75	0.700	4.26	0.519
6.6	Procured items in my company are delivered at the right time.	3.29	1.010	3.69	0.875
Mean of the means/ Standard deviations		3.698	0.794	4.037	0.682

Source: Survey data, 2023.

The international pharmaceutical procurement-related questions are intended to measure the procurement of pharmaceuticals in the public and private sector with respect to the 5 rights of procurement. Based on the response means, pharmaceuticals procured by the EPSS are at a lower price than the private importers, 3.67 with a standard deviation of 0.834 and 3.33 with a standard deviation of 0.806 respectively. This is explained by the tender process of procurement in EPSS that allows the suppliers to win and supply items only when they offer the cheapest price, given other formalities are fulfilled. All the items are responded in a way as explained by average of the mean values from the public and private importers, implying a satisfactory pharmaceutical procurement in accordance with adherence to the five rights of procurement, as the average of the means fall in the range 3.41 – 4.20 from the scoring range in Table 4.5.

### 4.5.7 Pearson Correlation Analysis

To investigate the association between the dependent and independent variables, Pearson correlation analyses was conducted for the private importers and EPSS.

#### 4.5.7.1 Pearson Correlation Analysis of EPSS data

**Table 4.18**

*Pearson correlation analysis for EPSS data.*

		Pharmaceutic al procurement	Buyer- supplier relationship	Supplier selection	Demand forecasting	Procurement procedure	Foreign currency
Pharmaceutical procurement	P.C	1	.575**	.305*	.369**	-.289*	-.331*
	Sig.		.000	.035	.010	.046	.022
	N	48	48	48	48	48	48
Buyer-supplier relationship	P.C	.575**	1	.458**	.616**	-.268	.013
	Sig.	.000		.001	.000	.066	.929
	N	48	48	48	48	48	48
Supplier selection	P.C	.305*	.458**	1	.467**	-.152	.138
	Sig.	.035	.001		.001	.303	.348
	N	48	48	48	48	48	48
Demand forecasting	P.C	.369**	.616**	.467**	1	.141	.216
	Sig.	.010	.000	.001		.341	.141
	N	48	48	48	48	48	48
Procurement procedure	P.C	-.289*	-.268	-.152	.141	1	.229
	Sig.	.046	.066	.303	.341		.118
	N	48	48	48	48	48	48
Foreign currency	P.C	-.331*	.013	.138	.216	.229	1
	Sig.	.022	.929	.348	.141	.118	
	N	48	48	48	48	48	48

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Source: Survey data, 2023.

Based on the output of Pearson correlation analysis on Table 4.18, Buyer-supplier relationship has a strong and positive correlation with international pharmaceutical procurement,  $r(48)=0.575$ ,  $p<0.05$ . Demand forecasting has a correlation with the dependent variable International pharmaceutical procurement with a Pearson correlation coefficient  $r(48)=0.369$ ,  $p<0.05$ . The next variable that has positive correlation is a supplier selection,  $r(48)=0.305$ ,  $p<0.05$ . The other independent variable procurement procedure has a negative correlation with the independent variable,  $r(48)=-0.289$ ,  $p<0.05$  and the other variable that has a negative correlation with the independent variable is Foreign currency,  $r(48)=-0.331$ ,  $p<0.05$ .

#### 4.5.7.2 Pearson Correlation Analysis of private importer's data

**Table 4.19**

*Pearson correlation analysis for private importers' data.*

		Correlations					
		Pharmaceutical procurement	Buyer-supplier relationship	Supplier selection	Procurement procedure	Demand forecasting	Foreign currency
Pharmaceutical procurement	P.C	1	.254*	.222*	.379**	.273*	.221*
	Sig.		.022	.047	.000	.014	.048
	N	81	81	81	81	81	81
Buyer-supplier relationship	P.C	.254*	1	.423**	.452**	.961**	-.008
	Sig.	.022		.000	.000	.000	.944
	N	81	81	81	81	81	81
Supplier selection	P.C	.222*	.423**	1	.633**	.453**	.053
	Sig.	.047	.000		.000	.000	.641
	N	81	81	81	81	81	81
Procurement procedure	P.C	.379**	.452**	.633**	1	.447**	.046
	Sig.	.000	.000	.000		.000	.686
	N	81	81	81	81	81	81
Demand forecasting	P.C	.273*	.961**	.453**	.447**	1	-.040
	Sig.	.014	.000	.000	.000		.724
	N	81	81	81	81	81	81
Foreign currency	P.C	.221*	-.008	.053	.046	-.040	1
	Sig.	.048	.944	.641	.686	.724	
	N	81	81	81	81	81	81

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Source: Survey data, 2023.

Based on the output of Pearson correlation analysis for private importers' data on Table 4.19, buyer-supplier relationship has a positive correlation with international pharmaceutical procurement with a Pearson correlation coefficient of  $r(81) = 0.254$ ,  $p < 0.05$ . Supplier selection has a positive and significant correlation with the dependent variable,  $r(81) = 0.222$ ,  $p < 0.05$ . The next variable procurement procedure has also has a comparatively higher, positive correlation with the dependent variable international pharmaceutical procurement,  $r(81) = 0.379$ ,  $p < 0.01$ . The remaining variables demand forecasting and foreign currency also show a positive correlation with the dependent variable with a correlation value of  $r(81) = 0.273$  and  $r(81) = 0.221$  with  $p < 0.05$  for both independent variables.

## 4.5.8 Tests of Assumptions

### 4.5.8.1 AUTOCORRELATION TEST

The goal of econometric analysis is to anticipate or predict the behavior of variables in the future. In order to forecast the characteristics of the variables, it is necessary to estimate the model's unobserved parameters. However, if a model's error term deviates from presumptions, the parameter estimations may not be accurate. The most often used test for autocorrelation in regression models is the Durbin-Watson (DW) test (Akter, 2014). Based on the test the values between 1.5 and 2.5 reflect non-autocorrelation.

#### Autocorrelation Test of EPSS data

The autocorrelation result using Durbin-Watson (DW) test can be seen in Table 4.24 with a value of 2.148. This reflects non-autocorrelation in the data for EPSS.

#### Autocorrelation Test of private importer's data

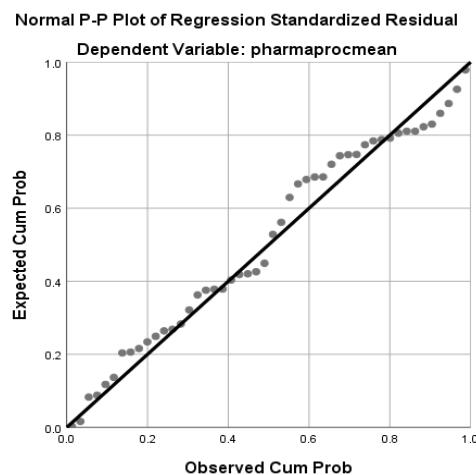
The autocorrelation result of the data from private importers using Durbin-Watson (DW) test can be seen in Table 4.27 with a value of 2.191. This reflects non-autocorrelation in the data for private importers as the value falls between 1.5 and 2.5.

### 4.5.8.2 LINEARITY TEST

#### Linearity test of EPSS data

#### Figure 4. 1

*Linearity test of EPSS data.*

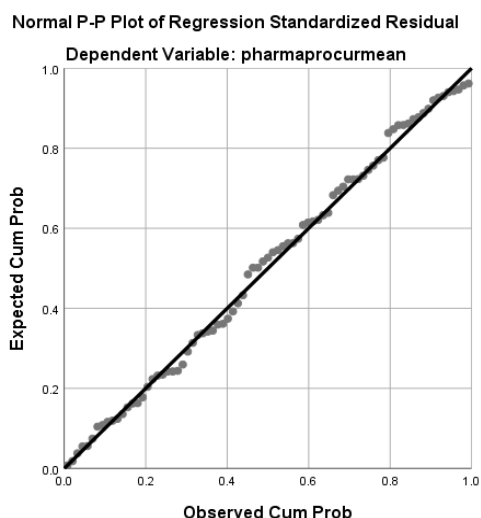


Source: Survey data, 2023.

## Linearity test of private importer's data

**Figure 4. 2**

*Linearity test of private importers' data.*



Source: Survey data, 2023.

### 4.5.8.3 NORMALITY TEST

According to Burns and Burns (2008), normality test can be done through the Shapiro-Wilk and Kolmogorov-Smirnov tests. The distribution of the sample does not deviate from a normal distribution if these tests are non-significant. Based on the result of normality test in the Tables 4.20 and 4.21, the Shapiro-Wilk and Kolmogorov-Smirnov tests for EPSS and private importers is approximately normally distributed. This is also shown in the Histogram for the normality test.

### Normality test of EPSS data

**Table 4.20**

*Normality Tests of Residuals for EPSS using K-S and Shapiro-Wilk test.*

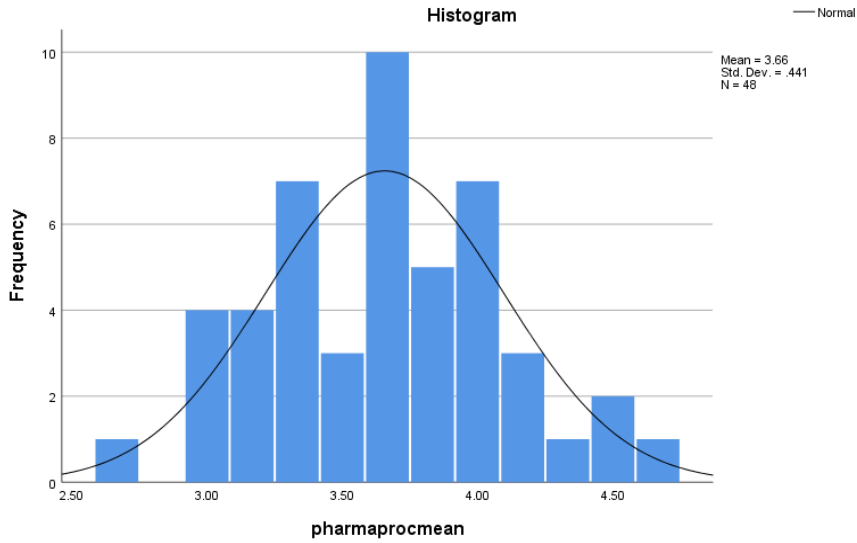
#### Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Pharmaceutical procurement	.114	48	.157	.978	48	.517

Source: Survey data, 2023.

**Figure 4. 3**

*Normality Tests of Residuals for EPSS.*



Source: Survey data, 2023.

**Normality test of private importer’s data**

**Table 4.21**

*Normality Tests of Residuals for private importers’ data using K-S and Shapiro-Wilk test.*

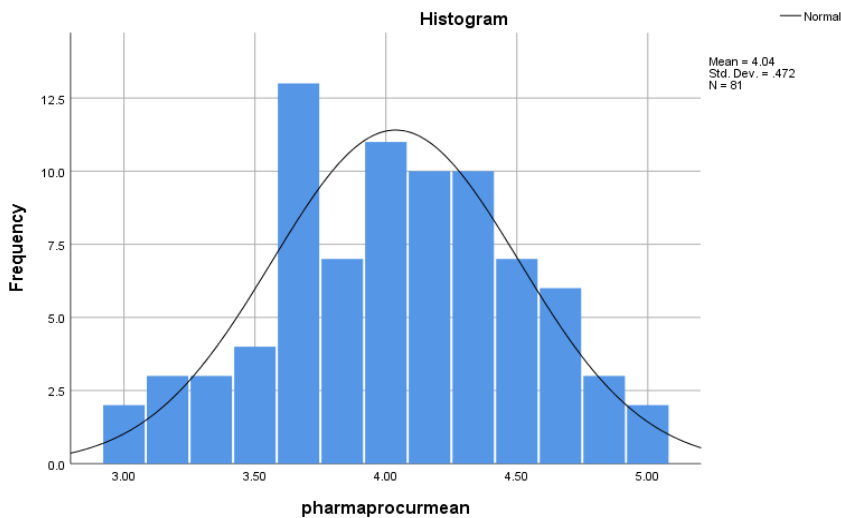
	<b>Tests of Normality</b>					
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Pharmaceutical procurement	.092	81	.085	.979	81	.210

a. Lilliefors Significance Correction

Source: Survey data, 2023.

**Figure 4. 4**

*Normality Tests of Residuals for private importers' data.*



Source: Survey data, 2023.

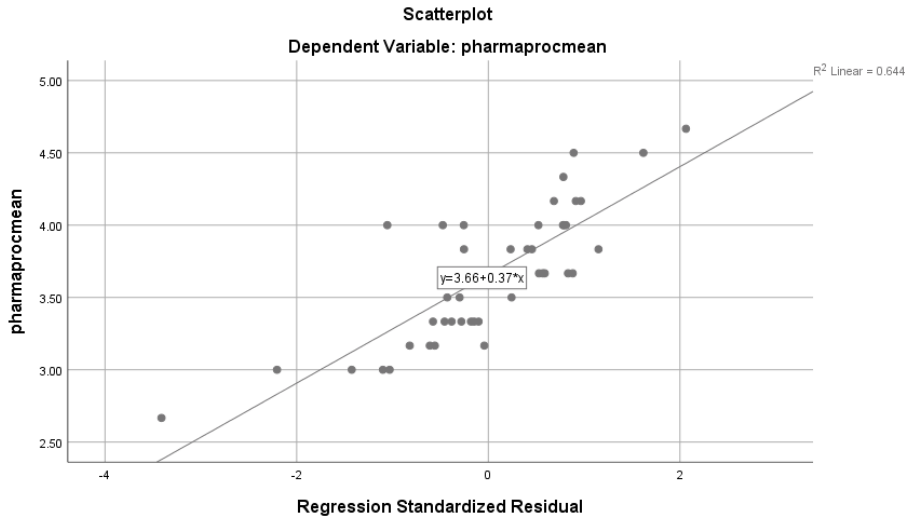
#### **4.5.8.4 CHECKING FOR HOMOSCEDASTICITY OF THE RESIDUALS**

According to Tranmer & Elliot (2008), it is possible to visually verify whether the residuals are homoscedastic by plotting them against the explanatory variables. There should be no patterns discernible in the scatter plot; it should resemble random noise. At all values of the other variable, the variability of scores for one variable should be substantially comparable (Burns & Burns, 2008).

## Homoscedasticity of residuals test of EPSS data

Figure 4. 5

Scatter plot for testing homoscedasticity for EPSS data.

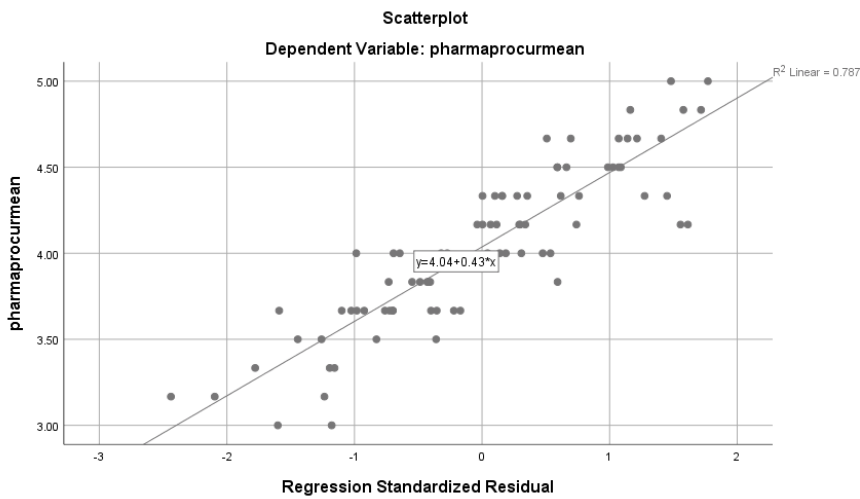


Source: Survey data, 2023.

## Homoscedasticity of residuals test of private importer's data

Figure 4. 6

Scatter plot for testing homoscedasticity for private importers' data.



Source: Survey data, 2023.

#### 4.5.8.5 MULTICOLLINEARITY

An additional crucial premise of multiple regression is that extremely high correlations between the independent variables should be avoided. This is the multicollinearity assumption. The Variance Inflation Factor (VIF) evaluates the effect of collinearity among independent variables on the accuracy of estimation in a multiple regression model. It describes the extent to which predictor collinearity reduces the accuracy of an estimate. A VIF value over 10.0 is typically a problem (Burns & Burns, 2008).

The independent variables in a linear regression model must be assumed to be linearly independent of one another. In the event that this presumption is incorrect, the independent variables will be multicollinear (Poole & O'Farrell, 1971).

#### Multicollinearity test of EPSS data

**Table 4.22**

*Collinearity statistics of EPSS data.*

#### Coefficients<sup>a</sup>

Model		Collinearity Statistics	
		Tolerance	VIF
1	Buyer-supplier relationship	.554	1.804
	Supplier selection	.701	1.427
	Demand forecasting	.541	1.848
	Procurement procedure	.764	1.309
	Foreign currency	.902	1.108

a. Dependent Variable: pharmaceutical procurement

Source: Survey data, 2023.

## Multicollinearity test of private importer's data

**Table 4.23**

*Collinearity statistics of private importers' data.*

Model		Collinearity Statistics	
		Tolerance	VIF
1	Supplier selection	.540	1.851
	Procurement procedure	.556	1.800
	Demand forecasting	.115	8.670
	Foreign currency	.984	1.016
	Buyer-supplier relationship	.123	8.152

a. Dependent Variable: pharmaceutical procurement

Source: Survey data, 2023.

### 4.6 Inferential Statistics

To determine and evaluate the statistical significance of the relationship between the dependent and independent variables, the study used multiple linear regression analysis. A regression model summary table, an Analysis of Variance (ANOVA) table, and tables showing the beta coefficients were used to display the results of the regression analysis. The independent variables of the study include; Buyer-supplier relationship, Supplier selection, Procurement procedure, Demand forecasting, and Foreign currency, and the dependent variable; International Pharmaceuticals Procurement. These investigations are taken for both the private and public sector separately in order for the researcher to compare between the effects of the factors with in the two sectors.

#### 4.6.1 Multiple linear regression analysis

##### 4.6.1.1 Multiple linear regression analysis of EPSS data

In Pearson's correlation analysis, variables that exhibited a correlation with international pharmaceutical procurement were included in the multivariate regression analysis. R-squared is a measure that assesses the dispersion of the data points around the regression line that has been fitted. In multiple regressions, it is referred to as the coefficient of multiple determinations, while it is known as the coefficient of determination in other cases. Based on Table 4.24, the value

0.526 represents that the independent variables in the model are responsible for the 52.6% of the variation in the international pharmaceutical procurement. The remaining 47.6% is explained by other factors that are not included in this study. Adjusted R square indicates the variation of the outcome in the model by the predictors that we are to keep, which is 46.9%. The estimate for this model to be wrong is explained by the standard error which is 0.34928 in this study.

**Table 4.24**

*Model Summary Table for EPSS data.*

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				Sig. Change	F	Durbin-Watson
					R Square Change	F Change	df1	df2			
1	.725 <sup>a</sup>	.526	.469	.34928	.526	9.306	5	42	.000	2.148	

a. Predictors: (Constant), foreign currency, buyer supplier relationship, procurement procedure, supplier selection, demand forecasting

b. Dependent Variable: pharmaceutical procurement

Source: Survey data, 2023.

**Table 4.25**

*ANOVA model fit for EPSS data.*

**ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.677	5	1.135	9.306	.000 <sup>b</sup>
	Residual	5.124	42	.122		
	Total	10.800	47			

a. Dependent Variable: pharmaceutical procurement

b. Predictors: (Constant), foreign currency, buyer supplier relationship, procurement procedure, supplier selection, demand forecasting

Source: Survey data, 2023.

**Table 4.26***Regression Coefficients of Variables for EPSS data.***Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized	T	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	2.335	.530		4.404	.000
	Buyer-supplier relationship	.290	.124	.334	2.342	.024
	Supplier selection	.013	.111	.015	.120	.905
	Demand forecasting	.317	.129	.356	2.462	.018
	Procurement procedure	-.105	.079	-.162	-1.332	.190
	Foreign currency	-.181	.054	-.374	-3.342	.002

a. Dependent Variable: pharmaceutical procurement

Source: Survey data, 2023.

The multiple correlation coefficient  $R = 0.725$  indicates there is a positive and strong relationship between the independent and dependent variable.

The F ratio in the ANOVA table evaluates how well the total regression model fits the sampled data. The independent variables are statistical predictors of the dependent variable international pharmaceutical procurement at  $F = 9.306$ ,  $p < .001$ . Thus, the regression model is good fit for the data tasted. This implies that the independent variables have a statistically significant impact in the dependent variable international pharmaceutical procurement.

The multiple linear regression results show that two of the independent variables have a positive statistically significant effects on the international pharmaceutical procurement with a significance value of less than 0.05.

The beta coefficient can be used to determine which of the independent variables have the most influence on the dependent variable, international pharmaceutical procurement. The standardized beta coefficient on Table 4.26 signifies the contributions of the independent variable in the study. The variable that has the highest contribution in the model is foreign currency with a relationship signifying that a one-standard-deviation increase in foreign currency is associated with a 0.374 - standard-deviation decrease in the outcome variable international pharmaceutical procurement, while holding all other independent variables constant. The second contributor is the demand forecasting variable followed by the buyer supplier relationship with a positive standardized beta coefficient value of 0.356 and 0.334 respectively.

It is shown in Table 4.26, the p values of the independent variables supplier selection,  $t=0.12$ ,  $p=0.905$  and procurement procedure,  $t=-1.332$ ,  $p=0.190$  are above 0.05, this implies that the coefficients of these independent variables are insignificant. On the other hand, the variables buyer-supplier relationship ( $t=2.342$ ,  $p=0.024$ ), demand forecasting ( $t=2.462$ ,  $p=0.018$ ) and foreign currency ( $t=-3.342$ ,  $p=0.002$ ) have a p value of less than 0.05 signifying their significance.

The regression equation can be established using the significant independent variables with a constant of 2.335. These variables are buyer-supplier relationship, demand forecasting and foreign currency.

The regression equation of the model for the EPSS organization becomes;

$$IPP = \beta_0 + \beta_1 BSR + \beta_4 DF + \beta_5 FC + \varepsilon$$

$$IPP = 2.335 + 0.290 BSR + 0.317 DF - 0.181 FC + \varepsilon$$

Where; IPP: International Pharmaceuticals Procurement

BSR: Buyer-supplier relationship

DF: Demand forecasting

FC: Foreign currency

$\varepsilon$ : Standard Error

From the above analysis and equation the following can be interpreted;

- The constant value ( $\beta_0$ ) with a value of 2.335 is the value that the dependent variable would be projected to have if all the independent variables were simultaneously equal to zero.
- The value of buyer-supplier relationship,  $\beta_1=0.290$  and  $p=0.024$ , signifies that a unit increase in buyer-supplier relationship will result a 29% increase in the value of the dependent variable International Pharmaceuticals Procurement.
- The Demand forecasting variable has a value of,  $\beta_2=0.317$  and  $p=0.018$ , signifies that a unit increase in buyer-supplier relationship will result a 31.7% increase in the value of the dependent variable International Pharmaceuticals Procurement.

- Foreign currency with a value of,  $\beta_3 = -0.181$  and  $p=0.002$ , signifies that a unit increase in buyer-supplier relationship will result a 18.1% decrease in the value of the dependent variable International Pharmaceuticals Procurement.

**H1o:** Supplier selection does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H1a:** Supplier selection has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

As per explained in the regression part of the EPSS data, Supplier selection is found to have an insignificant influence on international pharmaceutical procurement and is not a statistically significant predictor of international pharmaceutical procurement. Therefore, the study accepts the null hypothesis H1o.

These results are in contrary to the study done by Changanima et al. (2023) that suggests the crucial effect of supplier selection in the procurement process due to the significant impact that effective supplier selection may have on an organization's performance. The result also contradicts the study done by Krop and Iravo (2016), which explains the significant effect of supplier selection on procurement performance. Therefore, further study is required to analyze the influence of Supplier selection with more sample size, better depth and duration of study.

**H2o:** Procurement procedure does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H2a:** Procurement procedure has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

It is shown in the output of the regression analysis of EPSS data, the independent variable procurement procedure got a significance value of  $p= 0.190$ , which is greater than 0.05. Therefore, the independent variable is not a significant predictor of the dependent variable of international pharmaceutical procurement. Hence, the researcher accepts the null hypothesis H2o for the data gathered from EPSS. This result is contrary to the study done by Ali (2016), which explains the importance of an efficient procurement procedure to have an effective procurement. It also contravene from the WHO (1999) article as it states the importance of establishing an efficient procurement procedure for the procurement system. Nevertheless, the study's result shows similarity to that the procurement period won't be extended via the size or the centralized procurement type, providing evidence that the centralized and bulky tender procurement in EPSS wouldn't affect the procurement process with respect to time. Due to the intense workload,

additional specialists are required for larger procurements. Public bodies pay more attention and may invest more manpower when the amount of the procurement is larger (Wang et al., 2020).

**H3o:** Buyer-supplier relationship does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H3a:** Buyer-supplier relationship has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

Table 4.26 revealed that Buyer-supplier relationship significantly affects international pharmaceutical procurement in EPSS, where the value of  $\beta_1$  is 0.290 and  $p = 0.024$  and in Table 4.18 that there is positive and statistically significant relationship was observed between Buyer-supplier relationship and international pharmaceutical procurement with  $r = 0.575$ ,  $p < 0.05$ . As Weiers (2008) puts in his article, If the  $p$ -value  $<$  the specified level of significance, Reject the null hypothesis. Therefore the null hypothesis is rejected, while accepting the alternative hypothesis H3a. This result goes in line with how the determinants of Buyer-supplier relationship increase sustainable competitive advantage, which in turn enhances procurement success (Loice, 2015).

**H4o:** Demand forecasting does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H4a:** Demand forecasting has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

From the output of the multiple regression with the data gathered from EPSS, Demand forecasting has a  $\beta_4$  a positive significant effect on international pharmaceutical procurement with a  $\beta_4$  value of 0.317 and  $p = 0.018$ . In addition it has an  $r$  value of 0.369 which is significant at 99%. Thus accepting the alternative hypothesis H4a while rejecting the null hypothesis H4o. This result goes in line with the statement of Siddiqui et al. (2022) that it is crucial to have a demand forecasting system that is as accurate and error-free as possible to have an efficient supply chain and maintain the lead.

**H5o:** Foreign currency does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H5a:** Foreign currency has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

Table 4.26 shows that foreign currency has a negative, significant effect on international pharmaceutical procurement of EPSS. It has an effect with a  $\beta_5$  value of -0.181 and  $p < 0.05$ . Moreover from table 4.18,  $r = -0.331$ ,  $p = 0.022$  which is less than the specified level of significance 0.05. Thus rejecting the null hypothesis  $H_0$  and accepting  $H_1$ .

The Ministry of Finance in Ethiopia has stated that it is essential to limit the utilization of foreign currency to the importation of food, medicine, medical equipment, and manufacturing raw materials (Africanews, 2022). The public procurement sectors of these products are given more priorities than the private, pressuring them to enhance in the pharmaceutical procurement to address the needs despite the shortage in the foreign currency.

#### 4.6.1.2 Multiple linear regression analysis of private importers' data

**Table 4.27**

*Model Summary Table for private importers' data.*

Model Summary <sup>b</sup>										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.485 <sup>a</sup>	.235	.184	.42640	.235	4.617	5	75	.001	2.191

a. Predictors: (Constant), BUYERSUPP, foreign currency, supplier selection, procurement procedure, demand forecasting

b. Dependent Variable: pharmaceutical procurement

Source: Survey data, 2023.

**Table 4.28**

*ANOVA model fit for private importers' data.*

ANOVA <sup>a</sup>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.197	5	.839	4.617	.001 <sup>b</sup>
	Residual	13.636	75	.182		
	Total	17.833	80			

a. Dependent Variable: pharmaceutical procurement

b. Predictors: (Constant), Buyer-supplier relationship, foreign currency, supplier selection, procurement procedure, demand forecasting

Source: Survey data, 2023.

**Table 4.29***Regression Coefficients of Variables for private importers' data.*

		<b>Coefficients<sup>a</sup></b>				
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.505	.620		4.040	.000
	Supplier selection	-.148	.156	-.131	-.951	.345
	Procurement procedure	.305	.108	.381	2.810	.006
	Demand forecasting	.497	.235	.630	2.119	.037
	Foreign currency	.194	.086	.230	2.258	.027
	Buyer-supplier relationship	-3.062	1.795	-.492	-1.706	.092

a. Dependent Variable: pharmaceutical procurement

Source: Survey data, 2023.

The multiple correlation coefficients  $R = 0.485$ , indicates there is a positive and moderately strong relationship between the independent and dependent variable.

The F ratio in the ANOVA table for private importers evaluates how well the total regression model fits the sampled data. The independent variables are statistical predictors of the dependent variable international pharmaceutical procurement at  $F = 4.617$ ,  $p < .001$ . Implying the fitness of the regression model for the data tasted. This implies that the independent variables have a statistically significant impact in the dependent variable international pharmaceutical procurement.

The beta coefficients show which of the independent variables have the most influence on the dependent variable. The standardized beta coefficients allow us to compare the relative importance of different independent variables in the model and to interpret the strength and direction of the relationship. The variable that has the highest contribution in the model is demand forecasting (63%) with a positive relationship signifying for a one-standard-deviation increase in demand forecasting is associated with a 0.63 standard-deviation increase in the outcome variable international pharmaceutical procurement, while holding all other independent variables constant. The second contributor is the procurement procedure variable followed by the foreign currency with a standardized beta coefficient value of 0.381 and 0.23 respectively. The buyer-supplier relationship has a standardized beta coefficient value of -0.492, but this variable is not significant.

It is shown in Table 4.29 the p values of the independent variables supplier selection,  $t = -0.951$ ,  $p = 0.345$  and buyer-supplier relationship,  $t = -1.706$ ,  $p = 0.092$ , this implies that the coefficients of

these independent variables are insignificant as the p values are more than 0.05. On the other hand, the variables procurement procedure (t=2.810, p=0.006), demand forecasting (t=2.119, p=0.037) and foreign currency (t=2.258, p=0.027) have p values of less than 0.05 signifying their significance.

The regression equation can be established using the significant independent variables with a constant of 2.505. These variables are procurement procedure, demand forecasting and foreign currency.

Therefore the regression equation of the model for the private importers becomes;

$$PIPP = \beta_a + \beta_d PPP + \beta_e PDF + \beta_f PFC + \varepsilon$$

Where; IPP: Private International Pharmaceuticals Procurement

PPP: Private Procurement procedure

PDF: Private Demand forecasting

PFC: Private Foreign currency

$\varepsilon$ : Private Standard Error

Based on the coefficients from the regression output the model becomes;

$$PIPP = 2.505 + 0.305 PPP + 0.497 PDF + 0.194 PFC + \varepsilon$$

From the above analysis and equation the following can be interpreted;

- The constant value ( $\beta_a$ ) with a value of 2.505 is the value that the dependent variable would be projected to have if all the independent variables were simultaneously equal to zero.
- The value of procurement procedure,  $\beta_d=0.305$  and  $p=0.006$ , signifies that a unit increase in procurement procedure will result a 30.5% increase in the value of the dependent variable International Pharmaceuticals Procurement.
- The Demand forecasting variable has a value of,  $\beta_e=0.497$  and  $p=0.037$ , signifies that a unit increase in Demand forecasting will result a 49.7% increase in the value of the dependent variable International Pharmaceuticals Procurement.
- Foreign currency with a value of,  $\beta_f= 0.194$  and  $p=0.027$ , signifies that a unit increase in buyer-supplier relationship will result a 19.4% increase in the value of the dependent variable International Pharmaceuticals Procurement.

**H1o:** Supplier selection does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H1a:** Supplier selection has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

The regression part of the private importers' data explains, Supplier selection is found to have an insignificant influence on international pharmaceutical procurement and therefore not a statistically significant predictor of international pharmaceutical procurement. Therefore, the study accepts the null hypothesis H1o. This insignificant output is similar to the output in the data from EPSS. Therefore, this independent variable need to be studied with bigger sample sizes as the result contradicts with various studies.

**H2o:** Procurement procedure does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H2a:** Procurement procedure has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

From the output of the regression analysis the Procurement procedure variable has a significance value of less than 0.05, the cutoff value. Hence, the researcher rejects the null hypothesis H2o for the data gathered from private importers. This result is similar to the study done by Ali (2016) and the WHO (1999).

**H3o:** Buyer-supplier relationship does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H3a:** Buyer-supplier relationship has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

For the data from private importers, Table 4.29 revealed that Buyer-supplier relationship does not significantly affect international pharmaceutical procurement in private importers, where the value of  $\beta_e$  is -3.062 and  $p = 0.092$ . Therefore the null hypothesis is accepted. This result contradicts with the study results of Loice (2015). As a result, further study is required to analyze the influence of Buyer-supplier relationship in the private sector with more sample size, better depth and duration of study.

**H4o:** Demand forecasting does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H4a:** Demand forecasting has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

From the output of the multiple regression with the data gathered from EPSS, Demand forecasting has a  $\beta_e$  a positive significant effect on international pharmaceutical procurement with a coefficient value of 0.497 and  $p < 0.05$ . In addition it has and r value of 0.273 with  $p = 0.014$ . Thus similar to the EPSS case, accepting the alternative hypothesis H4a while rejecting the null hypothesis H4o.

**H5o:** Foreign currency does not have a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

**H5a:** Foreign currency has a significant effect on international pharmaceutical procurement of the public (EPSS) and private sector;

Table 4.29 shows that foreign currency has a positive significant effect on international pharmaceutical procurement of private importers. It has an effect with a  $\beta_f$  value of 0.194 and  $p < 0.05$ . Moreover from Table 4.19,  $r = 0.221$ ,  $p = 0.048$ , which is less than the specified level of significance 0.05. Thus rejecting the null hypothesis H5o and accepting H5a. WHO (1999), states the negative effect of having irregular funding as it delays payment, forcing a request of upfront payment and refusal of credits. Mogoi (2010) states how payment upon delivery significantly and positively affect prices and the procurement process. These studies signify the influence of foreign currency on international pharmaceutical procurement with respect to the five objectives.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATION

#### 5.1 Introduction

The findings are summarized in this chapter, and conclusions are made in light of the study's goals. The researcher then offers suggestions for the study's advancement as well as for the organizations under investigation. Finally, it highlights recommendations for future research by other scholars.

#### 5.2 Summary of major findings

The purpose of this study is to investigate the effects of Buyer-supplier relationship, Supplier selection, Procurement procedure, Demand forecasting, and foreign currency on International Pharmaceuticals Procurement with in EPSS (Ethiopian Pharmaceutical Supply Service) and private importers in Ethiopia. The study used primary data through questionnaire from both sectors and analyzed the data collected using SPSS (Statistical Package for the Social Sciences). The analysis used descriptive and inferential analysis to identify the effects of the independent variables on international pharmaceutical procurement and perform a comparison between the two sectors. The main findings of the research are outlined as follows;

- Descriptive statistic is done on both private and public data to provide a sense of the distribution of the data, aid in the detection of outliers and mistakes, and to allow discover relationships between variables, preparing the data for further statistical analysis. These are shown on Table 4.1 to 4.17.
- The five assumptions of linear regression were tested on both categories of data giving the desired outputs that can be referred to in chapter four.
- Pearson's correlation analysis indicated that relationship exists between the independent variables (Buyer-supplier relationship, Supplier selection, Procurement procedure, Demand forecasting, and Foreign currency) and international pharmaceutical procurement.

The correlation output of the private importers' data; Buyer-supplier relationship ( $r= 0.254$ ,  $p=0.022$ ), Supplier selection ( $r=0.222$ ,  $p=0.047$ ), Procurement procedure ( $r= 0.379$ ,  $p=0.000$ ), Demand forecasting ( $r=0.273$ ,  $p=0.014$ ), and Foreign currency ( $r= 0.221$ ,  $p=0.048$ ). All the

outputs have a significance value below 0.05, therefore the correlations are statistically significant.

The correlation output of the EPSS data; Buyer-supplier relationship ( $r= 0.575$ ,  $p=0.000$ ), Supplier selection ( $r=0.305$ ,  $p=0.035$ ), Procurement procedure ( $r= -0.289$ ,  $p=0.046$ ), Demand forecasting ( $r=0.369$ ,  $p=0.010$ ), and Foreign currency ( $r= -0.331$ ,  $p=0.022$ ). All the outputs have a significance value below 0.05, therefore the correlations are statistically significant.

- The regression analysis on the EPSS data showed that 46.9% of the variation in the international pharmaceutical procurement is explained by the independent variables. Based on the coefficients table output, supplier selection and procurement procedure are non-significant to the model with  $p > 0.05$  at 95% level of significance.

On the other hand the regression analysis on the private import data showed that 18.4% of the variation in the international pharmaceutical procurement is explained by the independent variables. Based on the coefficients table output, supplier selection and buyer-supplier relationship are non-significant to the model with  $p > 0.05$  at 95% level of significance.

- In comparison between the models of the private and public sector (EPSS), the study shows that demand forecasting has a higher influence on international pharmaceutical procurement of the private sector than EPSS. In addition, foreign currency has a negative relationship with international pharmaceutical procurement of the public sector, while having less effect on the public than the private import sector. Procurement procedure and buyer-supplier relationship are also found to have an effect on the pharmaceutical procurement of private importers and EPSS respectively. The remaining variable supplier selection, cannot be further examined in this paper due to the insignificance of the variables in both sectors, which can be explained by various factors.

### **5.3 Conclusions**

The study focuses on the procurement process of international pharmaceuticals in Ethiopia, specifically examining weather factors such as relationships between buyers and suppliers, supplier selection, procurement procedures, demand forecasting, and foreign currency issues have effect on the international pharmaceutical procurement. The research investigates these aspects within both the Ethiopian Pharmaceutical Supply Service (EPSS) and private importers in the country and show the different magnitude of the effect on the two sectors.

The results have significant implications for both practical applications and theoretical frameworks. From a theoretical perspective, the study contributes to the growing body of research on procurement and the factors for the current problems in international pharmaceutical purchases. Specifically, the study highlights the importance of demand forecasting and foreign currency in international pharmaceutical procurement, while the other factors are insignificant for this study whereas procurement procedure and buyer-supplier relationship have an effect on the pharmaceutical procurement within the private importers and EPSS respectively.

From a practical perspective, this paper provides evidence on how demand forecasting activities such as quantifying and studying needs before engaging in procurement and having a system to quantify needs can influence the procurement as well as how poor quantification of needs and sudden purchases influence the quality, quantity, source, price and time of procured items, which are drawn from the five key variables of procurement. Foreign currency is another factor that can influence the five key variables, with its current shortage and fluctuations with in the country. As shown from the model for the private import data analysis, procurement procedure can also influence the quality, quantity, source, price and time of procured items, based on the availability of annual procurement plans, inspection of imported products, local registration time and the overall lead time for the organization to handle the purchase. Buyer-supplier relationship is also another factor that is shown in the model for the EPPS data, which has an effect on the five key variables of procurement based on the offer the supplier gives in accordance to the degree of relationship with the customer purchasing.

However, the study is not without limitations. The sample was limited due to staff numbers and unwillingness of responders to assist in the data collection, which may limit the generalizability of the findings.

Despite these limitations, the study provides important insights on demand forecasting, foreign currency, procurement procedure and buyer-supplier relationship and their effects on international pharmaceutical procurement. Future research should aim to replicate the findings in other contexts and use probability designs to better understand the causal relationship between these constructs and have a better representation of the population.

Overall, this study highlights the importance of focusing on demand forecasting, foreign currency sources, procurement procedure and buyer-supplier relationship to improve the quality, quantity, source/supplier, price and time related issues of international pharmaceutical procurement in both private importers and EPSS.

#### **5.4 Recommendations**

In accordance with the results of the study and the current problems in the international pharmaceutical procurement in Ethiopia, the following recommendation are put forward for the private and public sector;

- As the results of this study reveals, Demand forecasting has a significant effect on the international pharmaceutical procurement in terms of quality, quantity, cost, location/source, and time. This effects are displayed in both the private and public sector. As a result, it is important to establish a more organized system for forecasting of demands prior to engaging in procurement as it has a considerable effect on the pharmaceutical procurement.
- Foreign currency is shown to have a positive and significant influence in the international pharmaceutical procurement of the private sector. As the interview responses reveal, this is mainly due to the fluctuation and unavailability of adequate foreign currency in Ethiopia. Therefore, the government should assist and create strategies to make foreign currency better accessible for pharmaceutical procurement, as pharmaceuticals are critically important products for a country.
- It is also recommended for Procurement procedures to be planned and less time consuming. In addition, buyer-supplier relationships should be positive so as to result great offers of price and delivery along with good quality and transparency regarding the products.

## **5.5 Scope of further research**

Despite the fact that this research has met its purpose, there are still limitations and areas that are not covered and explained with in this paper. Therefore the researcher suggests the following ideas as a direction for further researches.

The research is only conducted on the five variables that affect international pharmaceutical procurement in Ethiopia. These factors only account for 46.9% and 18.4% of the factors that influence international pharmaceutical procurement in the public (EPSS) and private importers, which means the remaining 53.1% and 81.6% respectively is explained by other factors that are not studied in this research. Based on this fact, the researcher recommends further study on other factors that can affect pharmaceutical procurement in both the public and private sectors.

Some of the independent variables in this paper are insignificant and this can be due to small sample size, random variation being too large or because it is correlated with other variables. This issue can also be examined and the effects of these variables can be studied in depth.

The study's focus is only on the International procurement side of pharmaceutical procurement and how the factors affect it. Future studies can investigate the effects of these factors in the procurement of locally produced pharmaceuticals.

Moreover, this study focuses on the international pharmaceutical procurement with in privately owned importers and EPSS (Ethiopian Pharmaceutical Supply Service) as a public importer. Despite the bulk the purchase, these are not the only organizations that purchase pharmaceuticals internationally. Non-governmental organizations, some governmental institutions and international organizations also purchase pharmaceuticals internationally, hence future studies can include these organizations in their studies.

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## **Annex 1: Questionnaires**

### **Questionnaires**

**Addis Ababa University**

**College of Business and Economics**

**Department of Management (International Business Management)**

Dear respondent,

My name is Eskedar Tilahun, pursuing a Master of Science Degree in International Business Management, Import-Export Management stream at Addis Ababa University college of Business and Economics. This particular questionnaire is designed to collect primary data for my research study entitled **“Factors Affecting International Pharmaceuticals Procurement in Ethiopia: Ethiopian Pharmaceuticals Supply Service versus Private Importers.”**

As the success and validity of this study depends on your response, I kindly request you to spend your valuable time on providing a response for all the questions as much as possible.

If there are any questions or inquiries regarding the questionnaire, please do not hesitate to contact me through my mobile phone number: +251938473030 or through my email address: [eskedartilahun15@gmail.com](mailto:eskedartilahun15@gmail.com). All the information you provide will be kept strictly confidential and only be used for academic purposes.

**Section 1: General information and demographic background of respondent.**

Please tick (✓) on the answer of your choice and provide your personal answers where applicable.

- 1. Gender      Male                       Female
  
- 2. Relevant work experience  
Less than 5 years                       5-10 years                       10-15 years   
15-20 years                       more than 20 years
  
- 3. Educational qualification  
Diploma                       First degree   
Second degree                       Above second degree
  
- 4. In which directorate are you working?  
Tender Management Directorate   
Contract Management Directorate   
Quantification and Market Shaping Directorate   
Other  \_\_\_\_\_
  
- 5. Designation with in the directorate  
Director                       Coordinator   
Senior expert                       Junior staff

Section 2: This part of the questionnaire is to gather information on the factors affecting the international pharmaceutical procurement. Please select your choice of answer or level of agreement by putting tick (✓) under the column. The following scale will be applicable:

**(Key 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree for each corresponding statements.)**

Please answer the following questions with regards to the company you are working in.

- 1. Please mark your level of agreement with the following statements with respect the effect of **Buyer- supplier relationship** on **International Pharmaceutical Procurement (Quality, Quantity, Place/source, Price and Time)**.

s.no	Buyer- supplier relationship related questions.	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
1.1	There is a cost cutting strategy available with our suppliers.					
1.2	The terms of delivery the suppliers offer us is beneficial to our company.					
1.3	Our organization has priorities in high demand products.					
1.4	Ordered items are always delivered to the delivery place on time.					
1.5	The suppliers are open when there is un favorability or quality issue of their products and they communicate it with our company.					
1.6	Our suppliers always supply the right quantity of products.					

**If you want to add anything, please specify?**

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**2. Please mark your level of agreement with the following statements with respect the effect of Supplier selection on International Pharmaceutical Procurement (Quality, Quantity, Place, Price and Time).**

s.no	Supplier selection related questions.	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
2.1	Our organization has a system to evaluate the suppliers prior to engaging in business.					
2.2	Our organization does a market analysis prior to selecting a supplier.					
2.3	Most supplier's response for prequalification documents is swift.					
2.4	Our organization does a market analysis in price before selecting a supplier.					
2.5	Our organization does a market analysis in quality or specification before selecting a supplier.					
2.6	The geographical location of the supplier matters in the selection of suppliers.					

**If you want to add anything, please specify?**

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**3. Please mark your level of agreement with the following statements with respect the effect of Procurement procedure on International Pharmaceutical Procurement (Quality, Quantity, Place, Price and Time).**

s.no	Procurement procedure related questions.	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
3.1	There are minimum requirements in our organization for a supplier to be considered for a procurement.					
3.2	Our organization can minimize the procurement process lead time with simple modifications.					
3.3	Our organization has annual procurement plan for items to be procured.					
3.4	Procured items are tested or inspected by the organizations staff for missing parts or quality issues.					
3.5	Our organization can assist in the local registration (if not registered) of the supplier's product if the products are deemed best quality by the organization.					

**If you want to add anything, please specify?**

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4. Please mark your level of agreement with the following statements with respect the effect of **Demand forecasting** on **International Pharmaceutical Procurement (Quality, Quantity, Place, Price and Time)**.

s.no	Demand forecasting related questions.	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
4.1	Our organization has a system to quantify the needs in the society.					
4.2	Our organization's purchase is based on studied and quantified need.					
4.3	There are sudden purchases in our organization due to poor need quantification.					
4.4	Emergency or sudden purchases have resulted low quality products.					
4.5	Emergency or sudden purchases have resulted in increased prices in products.					

**If you want to add anything, please specify?**

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5. Please mark your level of agreement with the following statements with respect the effect of **Foreign currency** on **International Pharmaceutical Procurement (Quality, Quantity, Place, Price and Time)**.

<b>s. no</b>	<b>Foreign currency related questions</b>	<b>Strongly disagree (1)</b>	<b>Disagree (2)</b>	<b>Neutral (3)</b>	<b>Agree (4)</b>	<b>Strongly agree (5)</b>
5.1	Foreign currency fluctuation and shortage has affected the quantity of our orders.					
5.2	The shortage of foreign currency has made our organization purchase low quality products.					
5.3	The shortage of foreign currency has made our organization purchase cheaper products.					
5.4	The shortage of foreign currency has made our organization purchase from specific countries or limited geographical locations.					
5.5	The shortage of foreign currency has affected the lead time to the delivery of ordered products.					

**If you want to add anything, please specify?**

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6. Please mark your level of agreement with the following statements on the **International Pharmaceuticals Procurement** of your company.

<b>s. no</b>	<b>International Pharmaceuticals Procurement related questions</b>	<b>Strongly disagree (1)</b>	<b>Disagree (2)</b>	<b>Neutral (3)</b>	<b>Agree (4)</b>	<b>Strongly agree (5)</b>
6.1	Procured items in my company are of the right quality.					
6.2	Procured items in my company are of the right quantity.					
6.3	Procured items in my company are at a low price.					
6.4	Procured items in my company are from a good source/supplier.					
6.5	Procured items in my company are delivered to the right place.					
6.6	Procured items in my company are delivered at the right time.					

**If you want to add anything, please specify?**

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