PORTFOLIO MATRIX ANALYSIS OF PHARMACEUTICALS PROCUREMENT: THE CASE OF EPSA

BY

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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted at any university for a degree.

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Statement of Certification

This is to certify that ShimelisAyele has carried out his research work on the topic entitled "Portfolio matrix analysis of pharmaceuticals procurement: the case of Ethiopian pharmaceuticals supply agency". The work is original in nature and is suitable for submission for the award of Master Degree in Logistics and Supply Chain Management
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This is to Certify that the thesis prepared by ShimelisAyele, entitled: Portfolio Matrix Analysis of Pharmaceuticals Procurement at EPSAsubmitted in partial fulfillment of the requirements for the degree of Degree of Master of Arts Logistics and Supply Chain Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

The objectives of this research areto assess the spend in the total expenditure, and supply risk (supplier availability rate) of regular medicines; to identify the category or position of each regular medicine according to: Leverage, Critical (strategic), Routine (non-critical), or Bottle neck items quadrant; and to assess tender processing periodat Ethiopian Pharmaceuticals Supply Agency (EPSA). The study used descriptive research design with quantitative research approach and documentary analysis of pure secondary data. The position of each regular medicine has been quantified empirically using secondary data from three years procurement record of the agency. Based on rigorous analysis of these data, 7.65% and 0.76% of the total items procured within these years have been found to fall in leverage and strategic item quadrant while 60.09% and 31.5% fell in non-critical and bottle neck quadrant of the matrix respectively. The finding on item category analysis indicates a profound problem of deviation from the typical item positioning feature which occurred because of the presence of least procured items and lack of suppliers for some number of items. The limitation of this study is that only the total FOB price and supplier availability rate of pharmaceuticals were taken as the basic variables to categorize items on the vertical and horizontal axes of Kraljic portfolio model.

Keywords:Procurement portfolio matrix, Pharmaceuticals procurement category, Pharmaceutical spends and supply risk

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TABLE OF CONTENTS

Title **Page**

List of figures……viii

Acronyms…….ix

Chapter 1: Introduction……1

1.1 Background of the Study……...2
1.2 Background of the Organization……3

1.3 Statement of the Problem……...3
1.4 Research Objectives……...5
1.3.1 General Objective……5
1.3.2 Specific Objectives……..6
1.4 Research Questions…….6
1.5 Significance of the study……6
1.6 Scope of the study…….7
1.7 Limitation of the study……...7
1.8 Operational definition of terms……...8
1.9 Organization of the study..……..9

Chapter 2: Review of related literature……10
2.1 Theoretical review……...……..10
2.1.1 Theories in public procurement……...10
2.1.1.1 Theory of auction and competitive bidding……...11
2.1.1.2 Contract theory……..11
2.1.1.3 Institutional, General Systems, Transaction Cost Economics, and Principal Agent Theories……12
2.1.1.4 Supply chain management theory…….12
2.1.2 Strategic Sourcing……..14
2.1.3 Procurement strategy……..14
2.1.4 Profit Impact (Impact on Business) and Supply risk……...16

2.2 Empirical review……....16
2.2.1 Purchasing portfolio management……...16
2.2.2 Strategic directions for managing category spends……17
2.2.3 Conditions for strategic directions……..20
2.2.4 Global sourcing and procurement strategy……..20
2.2.5 Knowledge gaps and Conclusion……21
2.3 Conceptual Framework……..21
Chapter 3: Research Methodology……...23
3.1 Research Approach and Design…….....23
3.1.1 Research Approach……...23
3.1.2 Research Design……..24
3.2 Population and Sampling……24
3.3 Data Collection……...25
3.4 Data Analysis……..25
3.5 Ethical Considerations……26
Chapter 4: Results and Discussions……...27
4.1 Introduction……27
4.2 Response rate and demographic data……..28
4.3 Results……28
4.3.1 Spend analysis overview……28
4.3.2 Supply risk analysis overview……29
4.3.3 Item category (positioning) overview……29
4.3.4 Tender processing period analysis overview……30
4.3.5 Spend analysis……30
4.3.5.1 Spend by year……...30
4.3.5.2 Spend by item……..30
4.3.5.3 Spend by vender (supplier)……..31
4.3.6 Supply risk analysis ……32
4.3.7 Item category (positioning) study……32
4.3.8 Tender processing period analysis……...33

4.4 Discussion……34
Chapter 5: Conclusions and Recommendations……37
5.1 Summery of the findings…….37
5.2 Conclusions…….38
5.3 Recommendations……...40
5.4 Suggestions for further study……..42
References…….43
Appendix A: Research Instrument on Tender Result..…….46
Appendix B: Research Instrument on business impact, supply risk, and tender processing period……47

LIST OF TABLES

Table 4.1 Supplier availability rate values' central tendency……..27

Table 4.2 Total number of items and active suppliers……..28

Table 4.3 Three years procurement volume……..30

Table 4.4 Portion of total number of items with 80% of total spend……30

Table 4.5 Top 20% of items with the highest number of vendors…….31

Table 4.6 Top 20% of vendors (suppliers) with the highest order value……31

Table 4.7 Top 20% of total vendors supplying the highest number of items per annum……...31

Table 4.8 Item supply risk value…….32

Table 4.9 Mean annual procurement amount & number of items per item quadrant……32

Table 4.10 Tender processing period per procurement method……33

LIST OF FIGURES

Fig. 2.1 Categories and strategies in the Kraljic approach
(Gelderman and Van Weele, 2002)……...17
Fig. 2.2 Summery of strategic directions for every category (modified from Gelderman and Van Weele 2003)……..19
Fig. 4.1 Items position……..33
Fig. 2.3 Item category versus procurement strategy……22

ACRONYMS

EPSA – Ethiopian Pharmaceuticals Supply Agency

FPPA– Federal Public Procurement and Property Administration Agency

PPA– Public Procurement and Property Administration Agency

MoFED– Ministry of Finance and Economic Development

FMoH– Federal Ministry of Health

FOB–Free on board

ETB – Ethiopian Birr

ICB – International competitive bidding

RT – Restricted tender

DT – Direct tender

IS – International shopping

SPM – Suppliers positioning matrix

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Procurement is the process of acquiring all the materials needed by an organization. Procurement and purchasing are most of the times assumed to have the same meaning. Nevertheless, purchasing commonly refers to the actual buying, while procurement has a broader meaning. It can include different types of acquisition (purchasing, rental, contracting, and so on) as well as the associated work of selecting suppliers, negotiating, agreeing terms, expediting, monitoring supplier performance, materials handling, transport, warehousing and receiving goods from suppliers (Waters, 2003).Public procurement is in continuous evolution both conceptually and organizationally as governments at all levels are under increasing pressures to "domore with less." In fact, every governmental entity of countries in the world is struggling in theface of unrelenting budget constraints; government downsizing; public demand for increasedtransparency in public procurement; and greater concerns about efficiency, fairness, and equity.Moreover, public procurement professionals have faced a constantly changing environment such as rapidly emerging technologies, increasing product choice, environment concerns, and the complexities of international and regional trading agreements (Thai, 2009).

When it comes to the review of Ethiopian public procurement trend,the procurement proclamationforces public bodies that they shall maintain records of procurements listed in article 23 of the proclamation and other pertinent documents.Article 33 of the directive proclaims that any supplier other than persons renting houses apart from those engaged in real estate business and those supplying goods and services to branches of federal government public bodies located outside of Addis Ababa where there are no registered suppliers are required to be registered in the supplier list to participate in any public procurement. And only six methods of procurement are used in public procurement: Open bidding which is the preferred method of procurement of goods, works and services (Consultancy and Non Consultancy) unless the threshold levels or circumstances relating to a specific requirement make it more appropriate for one of the other procurement methods to be used; and request for proposals, two stage bidding,

restricted bidding, request for quotation, and direct procurement are the other methods which can be used under strictly predetermined conditions (PPA, 2011).

According to Thai (2009), the goal of involving any form of decision support for bid evaluation is to help the effective andefficient creation of the tender document (and procurement method in the case of this study) and the execution of the evaluation itself such that theyserve the goals of the tender, the process leads to high quality bids, and the result can be defended. In the case of public procurement, procurement strategy means the leading global principle that defines the high level goals and expectations of thecontracting authority such as: finding a good, known and reliable supplier; price matters most; it does not have to be cheap as long as the quality is high and so on. Main factors that determine a procurement strategy are market conditions and expectations of the stakeholders against the supplier.

Not every relationship of buyer and supplier is expected to be managed in the same manner. As stated by Bensaou (1999), a significant achievement of supply chain management is resulted from an effective and efficient management of portfolio relationship.Procurement portfolio models have attracted a lot of interest of scholars on supply chain management. One of the most acceptable portfolio models was pioneered by Kraljic (1983) which affected the course of thinking of professional purchasers (Kamann and Bakkar, 2004).Kraljic (1983) introduced his portfolio model based on two broad variables, profit (business) impact and supply risk.

This research paper is a case study ofportfolio matrix analysis of pharmaceuticals procurement as per Kraljic portfolio model at Ethiopian Pharmaceuticals Supply Agency (EPSA).

1.2 Background of the Organization

Ethiopian Pharmaceuticals Supply Agency, EPSA, is legal organization which was established under the Federal Democratic Republic of Ethiopian Government's lawto conquer the problems and insure uninterrupted supply of pharmaceuticals to the public at an affordable price. Based upon proclamation No. 553/2007, it was established in September 2007 as part of Pharmaceutical Logistic Master Plan implementation for the following objectives:Assisting public health institutions to supply quality assured essential pharmaceuticals at affordable prices

in a maintainable manner to the public;Engaging a complementary role in developmental efforts for health service expansion and strengthening by ensuring enhanced and sustainable supply of pharmaceuticals;Producing enabling conditions for enhancing the accumulation of funds in its revolving and cost recovery process and thereby ensure the realization of the objectives(Ethiopian Pharmaceuticals Supply Agency, 2016-2019).

As per article 33 of the proclamation, the federal public procurement directives of Ethiopia restricts the procurement methods to be used in any public procurement to open bidding, restricted bidding, request for quotations, single source/direct procurement, request for proposal, and two stage bidding. It also emphasizes that except as otherwise provided in the proclamation and this directive, public bodies shall use open bidding as the preferred procedure of procurement.As any public body, EPSA is supposed to record a statement of the grounds and circumstances on which it relied to justify the use of a method of procurement other than open bidding, pursuant to article 33/3 of the Proclamation (FPPA, 2010).

1.3 Statement of the Problem

EPSA as a public body may use a method other than open bidding only where conditions for use of such other method stipulated in the proclamation and this directive are satisfied (FPPA, 2010). The public procurement manual reports that a public body may undertake procurement by the restricted bidding method:When procured items have a limited number of suppliers;when the cost of procurement does not exceed the specified threshold for restricted bidding; when repeated advertisement for invitation fails to attract bidders.The absence of competition due to technical reasons that the items are supplied by one candidate is one of the conditions for which direct procurement method is permitted according to the manual. The manual also states that request for quotation (shopping) method of procurement is usedfor: low value items, readily available items, and standard off the shelf items. The manual refers to article 57 and 58 of the proclamation to claim that two stage bidding shall be carried out in accordance with the proceduresset forth for national or international competitive bidding (PPA, 2011).

A study by Haymero (2015) shows that the public procurement regulation impacts the public pharmaceuticals procurement efficiency at EPSA. The study concludes thatlow financial

thresholds of the PPA regulation and lack of consideration to nature of pharmaceuticals are some of the factors that affect efficient public pharmaceutical procurement practices at the agency. The study also recommends thatPPA&MoFED“Should introduce a comprehensive and sector-specific procurement manual for pharmaceuticals, with a concise set of clear rules and guidelines”. It also suggests the preparation of separate threshold matrix for different procuring entities based on the type and cost of products they procure, core missions, values, and the annual procurement expenditure of procuring entities. The need to regular revision of the financial thresholds for different procurement methods based on national and international market conditions of pharmaceuticals and international best practicesis one of the recommendations made by this study. It also advises EPSA, FMoH, andEPSA’sboard of directorsto publish and disclose the latest market values of pharmaceuticals on a regular basis and inform policy makers in public procurement.

Summarizing briefly and clearlyevidences that support the need of performing this research,the Ethiopian public procurement manual by PPA (2011) in the first paragraph of this sub-topic can be taken as one of the evidences. This manual obliges public bodies to use restricted method only when procured items have a limited number of suppliers and when the cost of procurement does not exceed the specified threshold for restricted bidding. The manual also restricts public bodies to use request for quotation (shopping) method of procurement for readily available items. It is clear that this obligation demands the public bodies to assess number of available suppliers and cost of procurement for each item procured which is the ultimate purpose of this study.

The other evidence is the study by Haymero (2015) in the second paragraph of this sub-topic which focuses on the need of regular reassessment ofthe variables: financial threshold, the type and cost of products, and international market conditions of pharmaceuticals. It is definitely trivial that Kraljicportfolio analysis approach is the right prescription to assess all of these variables.Therefore, it is reasonable to conclude that the findings of this paper will assist all procurement stakeholders for EPSA in making the appropriate decision in financial threshold preparation and selection of the relevant procurement method for each item to be procured.

Different researchers have tried to address some of the problems of pharmaceuticals supply chain management at EPSA. These include assessment of factors influencing good pharmaceuticals procurement practice at EPSA by Berhie (2017); and assessment of pharmaceuticals distribution system: the case of EPSA by Teketel (2017). Nevertheless, neither of these studies addressed the challenges faced by the agency due to the absence of procurement strategy based on pharmaceuticals category as per Kraljic portfolio matrix. As recommended by Haymero (2015), the cost and supply market complexity of each pharmaceutical, both of which need periodic update are not being assessed. This problem has a negative effect on facilitation of procurement method selection by procurement officers which often generates other problem of public procurement law violation or unnecessary procurement lead time delay whenever irrelevant procurement method is selected. This is the reason that made the need of conducting this study in the context of the public procurement directives and manual.

1.4 Research questions

1. What is the expenditure (spend) of each pharmaceuticalin the total expenditure (spend) of procurements made in 2015, 2016, and 2017?
2. What is the supply risk (supplier availability rate) of each pharmaceutical invited to suppliers in 2015, 2016, and 2017?
3. Which category or position (Leverage, Critical(strategic), Routine(non-critical), or Bottle neck items quadrant) does each pharmaceutical belongs to?
4. What is the tender processing period of each pharmaceutical as per the procurement method used in 2015, 2016, and 2017?

1.5 Research Objectives

1.5.1 General Objective

The general objective of this study is to analyze portfolio matrix of pharmaceuticals procurement as per Kraljic (1983) portfolio model in Ethiopian Pharmaceuticals Supply Agency.

1.5.2 Specific Objectives

The specific objectives of the study are as follows:

1. To assess theexpenditure (spend) of each pharmaceutical in the totalexpenditure (spend) of procurements made within three years (2015, 2016, and 2017).
2. To assess supply risk (supplier availability rate) of each pharmaceutical invited to suppliers within three years (2015, 2016, and 2017).
3. To identify the category or position of each pharmaceutical according to: Leverage, Critical (strategic), Routine (non-critical), or Bottle neck items quadrant.
4. To assess tender processing period of each pharmaceutical as per the procurement method used within three years (2015, 2016, and 2017).

1.6 Significance of the study

The ultimate purpose of this study is to contribute to the rarely available pool of knowledge about pharmaceuticals category as per Kraljic portfolio model in Ethiopian Pharmaceuticals Supply Agencyin the context of Ethiopian public procurement proclamations. The study is also supposed to shed light on the relevance of pharmaceuticals procurement by category which has an immense advantage for different stakeholders: for policy makers to review the existing practice and revise pharmaceutical procurement policy; for senior managers of the agency to consolidate each pharmaceutical according to the identified category and to take the appropriate decision on which procurement method to use for the procurement of each pharmaceutical, thereby enhancing organizational performance;for procurement officers of the agency to facilitate the procurement activities; for researchers at the agency as a facilitator of further investigation; and finally, the findings of the study will play anacademic role as an input for scholars or students undergoing a study on relatedissues.

1.7 Scope of the study

Procurement consists of all the related activities needed to get goods, services and any othermaterials from suppliers into an organization such as: selecting suppliers, negotiating, agreeing terms, expediting, monitoring supplier performance, materials handling, transport, warehousing and receiving goods from suppliers.Being value adding processes, all of these

activities have a direct or indirect impact on the procurement cost of an item or total item.Even if it would have beencrucial to includeall of the costs of these activities, because of infeasibility from resources such as cost and man power perspectives, this study had focused on the assessment of free on board (FOB) price of some items(the three years, 2015-2016, 2016-2017, 2017-2018, procurement records of the entire list of regular medicines) as procurement cost of an item and total items.

The other concept here is that Kraljicdefines supply risk in terms of the assessment of availability, number of suppliers, competitive demand, make or buy opportunities, and storage risk and substitution possibilities. Once again, because of the reason mentioned in the previous paragraph,only assessment of supplier availability rate had been performed to describe supply risk of selected items in this study.The study used procurement documents of pharmaceutical items procured within three years (2015, 2016, and 2017) as secondary dataand target population of the study. And it used Pareto analysis to categorize items on the profit impact axis of Kraljic portfolio matrix based on their procurement price and it utilizedsimple excel sheetsto categorize items along the supply risk axis of the matrix based on their supplier availability rate.

The study was conducted from March 15/2020 to June 08/2020 at EPSA with an insignificant amount of budget allocation for the data collection and analysis process were carried out only by the researcher.

1.8 Limitation of the study

The primary limitation of this study wasthe challenge to access procurement documents to be used as a secondary data to be analyzed. Even though the public procurement proclamation and other pertinent documentoblige public bodies to maintain procurement records for auditing purpose and most of them including the agency under this study strictly obey this rule, they are very sensitive for the confidentiality of the documents. Because of this, public bodies are very vigilant to let documents be accessible for anyone who asks for them. However, because of the potential of the findings of this research to resolve some of the thematic areas of the agency,it became possible to access these documents through official requestfrom tender management directorate of the agency.

1.9 Operational definition of terms

Pharmaceuticals - any substance or mixture of substances used in the diagnosis, treatment,mitigation or prevention of a disease(Epsa, 2016-2019).

Cost of each pharmaceutical–unit FOB price of each pharmaceutical multiplied by the quantity of that pharmaceutical in that specific procurement.

Total procurement cost– the total FOB price of the whole item in that specific procurement.

Supply risk (supplier availability rate)–obtained by multiplying the total number of available qualified suppliers of that item with the percentage (fraction) of the quantity supplied out of the total quantity requested.

Tender processing period–the time elapsed between the date of procurement request to director general of the agency and the date on which official winners' list is announced to bidders.

1.10 Organization of the study

This study is organized in five chapters: the first chapter deals with an introduction of the study; the second chapter presents review of related literature; the third chapter outlines the methodology of the study; the fourth chapter focuses on results and discussion of the study; and finally, chapter five presents summary, conclusions, and recommendations for the main findings of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

As cited by Baily et al. (2005),initiatives and policies such as market testing, contracting out, private financeinitiative, competing for quality, facilities management and partnering all affect how equipment, goods and services are procured within government and the public sector. They help to shape the approach to the market, the preparation of the specification and evaluation of the most economically advantageous tender followed by pertinent relationships in order to meet the requirement. Baily and his colleagues also claim that no organization will wish to develop mutual or partnership relationships with all of its suppliers. Pareto's principle applies: it will generally be found that 80 per cent of expenditure will be with 20 percent of suppliers; and it is likely to be the suppliers with whom large sums of money are spent who will be the ones with whom closer relationships are sought. They assert that a useful tool in determining those suppliers with whom close relationships might best be sought is the 'Procurement Positioning' tool based on the work of Kraljic (1983).

This chapter presents the review of both theoretical and empirical literature. The first section reviews the theory while the second one presents the empirical literature. The conclusion and knowledge gaps are presented at the end.

2.1 Theoretical Review

2.1.1 Theories in public procurement

A systematic literature review on public procurement researches shows that 29 percent of articles are theoretically grounded, with the incidence of theory having increased in recent years. The review reveals that among these theories, theory of auction and competitive bidding is being used most predominantly in public procurement and which is followed by theory of principal-agency while transaction cost economic theory, contract theory, general systems theory, institutional theory, and supply chain management theory are theories that follow respectively to be used solely. Moreover, the study claims that 14% of thesearticles used either of the above

mentioned theories in combination while 32% are grounded on other theories (Flynn and Davis, 2014).

2.1.1.1Theory of auction and competitive bidding

As described by Milgrom et al. (1982), a model of competitive bidding is developed in which the winning bidder's payoff may depend upon his personal preferences, the preferences of others, and the intrinsic qualities of the object being sold. Pomázi (2013) states that the term auction refers to the concept of purchase and sale, because auction as a method of exchange may not only be used for a seller to choose from a number of potential buyers to deal with (traditionally referred to as auction), but also for a buyer to choose the appropriate supplier or service provider. In procurement, auctions have the benefit ofallowing the buyer to obtain the best price as a result of competition. Their drawback is that the desired effect can be achieved only if certain conditions apply (for example, an adequate number of bidders need to participate), and that competition can easily become detrimental to quality where it cannot be included in a contract. The advantage of a negotiated procedure is that it relieves the contracting authority fromthe burden of producing the most perfect tender specifications possible; however, regulators are generally reluctant to allow it because the bids made in negotiations are not necessarily comparable, and collusion may be suspected on grounds of communication between the buyer and the seller. For that reason, public procurement laws in most cases require contracting authorities to implement first-price auctions.

2.1.1.2 Contract Theory

Generally, procurement contracts can be classified in to different categories based on the way payment is made to the supplier. According to Rogerson (1992), there are four types of procurement contracts employed by U.S. Department of Defense: pure fixed price contracts by which suppliers receive a fixed payment for items procured regardless of the suppliers' incurred costs; pure cost reimbursement contract is the type of contract in which the payment to be made to the supplier is the cost incurred by the supplier in producing the item; incentive fixed price contract is the third type of contract in which payment to the supplier increases with regard to cost within a fixed threshold cost level; and finally, incentive cost reimbursement contract is the

fourth type of contract in which payment to the supplier increases with regard to cost up to a threshold, and then considers any realized cost exactly above the threshold. Now days, all of the above types of contracts are broadly categorized as a variation on two basic types of contracts: fixed price and cost-based contracts.

2.1.1.3 Institutional,General Systems,Transaction Cost Economics, andPrincipal-Agent Theories

These are some of the theoretical perspectives applied to strategic sourcing as described by Shook et al. (2009). Institutional theory is the theory in which external forces pressure firms to behave in certain ways and not behave in others. Firms are advised to avoid fads and to use a sourcing approach only if the approach matches the firm's strategy, not just because the approach is used by others.General systems theory applies when organizations are best viewed as part of an interwoven and intertwined system. The purchasing organization is recommended to seek multiple sources in complex and uncertain environments. Transaction cost economic theory is a theory that advocates firms making decisions that minimize costs. Firms are encouraged to buy when transaction costs are less than production costs. Principal-agent theory is a theory which applies when one firm, the principal, delegates another, the agent. In this case the principal is supposed to monitor the agent to reduce risk of opportunistic behavior. For the costs of monitoring the agent are parts of the transaction costs, the principal is recommended to buy when transaction costs are less that the production costs.

2.1.1.4 Supply Chain Management Theory

Halldorsson et al. (2016) asserts that borrowing from complementary theories has become an important part of theorizing SCM. He claims that supply chain management theories are being built upon four different theories: principal-agent theory (PAT), transaction cost analysis theory (TCA), network theory (NT), and resource-based view theory (RBV) to provide insights on how to structure a supply chain and manage it. The author, according to the findings of extensive literature review, suggests that the integrative and multi-layered nature of SCM sets the conditions for "theorizing SCM" that can take place through various forms: theory application, new theoretical combinations and sensitivity to managerial practice.

As reviewed by Halldorssonet al. (2007), the logic behind the above four theories are summarized as follows. SCM mitigating agency problems, the principal-agent theory (PAT) is the theory that which based on the separation of ownership and control ofeconomic activities between the agent and the principal, various agency problems may arise, such as asymmetric information between the principal and the agent, conflicting objectives, differences in risk aversion, outcome uncertainty, behavior based on self-interest, and bounded rationality. The contract between the principal and the agent governs the relationship between the two parties, and the aim of the theory is to design a contract that can mitigate potential agency problems.Transaction cost analysis (TCA) theory which reflects SCM as coordination of transferred rights of disposals offers a normative economic approach to determine thefirm's boundaries and can be used to present efficiency as amotive for entering inter-organizational arrangements. A company may reduce itstotal transaction costs (ex ante and ex post costs of contact,contract, and control) by cooperating with external partners.

Halldorsson et al. (2007) also claim that the network perspective (NT), which is viewed as SCM as reciprocated interactions between institutions, states that the performance of a firm depends not only on how efficiently it cooperates with its direct partners, but also on how well these partners cooperate with their own business partners. The resourcebasedview theory (RBV), which reflectsSCM as coordination of relational assets, deals with competitive advantages related to the firm's possession of heterogeneous resources (financial, physical, human, technological, organizational, and reputational) and capabilities (combination of two or more resources). These resources and capabilities constitutethe core competence of the particular firm and serve ultimately as its source of competitive advantage.

Sourcing, which is the process of finding and scrutinizing suppliers, is the stage that comes before any purchases are made and can be considered as a subset of the procurement process.Procurement is the full process of sourcing and then using suppliers to gather all the materials to be purchased and indirect costs. It involves placing orders with each supplier , receiving the goods, paying for them (Biedron, 2018).

2.1.2 Strategic sourcing

As remarked by Hong and Kwon (2012), increasingly, procurement management is becoming a strategicpriority of firms for their sustainable competitive advantage in turbulent times.In today's dynamic market environment, procurement is positioned as a criticalintegrative business process and its focus has been extended from short term cost minimization to long term value creation and delivery. Therefore, for the sec of achieving long term value creation and delivery, strategic procurement needs to be considered as one of the procurement strategies (methods) which are being applied in public procurement.

According to Harwood (2009), the conceptual model of strategic sourcing has three key elements: component management, sourcing strategy, andsupplier relations. Not only is a strategic view taken of supplier relations, but also ofthe materials or services being sourced, which together allow sourcing strategies to be developedwhich should improve security of supply. Specifying requirements demands their identification and quantification. These will facilitate deriving long-term estimates of requirements bycategory (family or commodity type) of materials and services which serves twopurposes: it allows the quantification of requirements and the identification of high volume or high value quantities; and the essential characteristics are established which must be consideredwhen developing a sourcing strategy for a particular category.

Moreover, Harwood (2009) asserts thatthe sourcing strategy provides aframework to guide the selection of the suppliers, allowing the strategic role of each selectedsupplier to be clearly defined. Consideration should be given to the nature of the relationship withthe supplier and whether it is to be arm's length, a partnership or somewhere in between. This is the main goal of this research which is to categorize pharmaceutical items according to their value and supply security to help in selecting a proper procurement strategy (method) at EPSA in the context of the public procurement law of Ethiopia.

2.1.3Procurement strategy

Based on the above theoretical reviews, in order to improve its sustainable competitive advantage and supply security, every organization whether public or private needs to determine which procurement strategy to use for every good or service that it procures; and what type of supplier relationship to have for each good or service to be procured. Now days, the famous and useful tool that assists purchasing organizations in determining which procurement strategy to use for every good or service that they procure; and what type of supplier relationship to have for each good or service to be procured is the 'Procurement Positioning' tool based on the work of Kraljic (1983).

Kraljic (1983) claims that "purchasing must become supply management". He presents a matrix that sorts out four 'stages of purchasing sophistication' in organizations: (I) 'purchasing management' that focuses on non-critical items; (II) 'materials management', procurement focusing on leverage items; (III) 'sourcing management', procurement focuses on bottle neck items; (IV) 'supply management' for which he argues that it is particularly relevant in the case that the supply market is complex and the importance of purchasing is high and procurement focus to be on strategic items.

His article recommends four phases as a reference frame for managing supply strategies. In the first phase, an organization is supposed to classify all of its purchased items in terms of profit impact and supply risk. He defines profit impact in terms of the volume purchased, percentage of total purchase cost, or impact on product quality or business growth. And he defines supply risk in terms of the assessment of availability, number of suppliers, competitive demand, make or buy opportunities, and storage risk and substitution possibilities. Finally, he suggests that using these criteria, an organization can sort out all of its purchased items into four categories: strategic (high profit impact, high supply risk), bottle neck (low profit impact, high supply risk), leverage (high profit impact, low supply risk), non-critical (low profit impact, low supply risk).

In the second phase, he argues that an organization is expected to measure the bargaining power of its suppliers against its strength as a buyer. The third phase is about positioning the materials identified in the first phase as strategic in the purchasing portfolio matrix. In the fourth phase, he

proclaims that the organization should develop procurement strategies and action plans for these strategic products, based on its strength and the supply market'sstrength. Finally, he recommends three general purchasing strategies: exploit (in case of buyer dominance), balance (in case of balanced relationship), and diversify (in case of supplier dominance) (Kraljic, 1983).

2.1.4 Profit Impact (Impact on Business) and Supply risk

Kraljic (1983) defines the vertical axis of the matrix, profit impact (impact on business), in terms of the volume purchased, percentage of total purchase cost, or impact on product quality or business growth. Therefore, it is obvious that categorizing commodities on this axis is a function of the variables, either cost and/or value of commodity which have a trade off effect on the performance of procurement operation (Verheyden, 2003). In case of cost based portfolio model, Pareto analysis is used to determine the level of spend relative to other categories. A Pareto principle is achieved when 20% of spend categories give rise to 80% of the spend (Spring Tide, 2010). Klaljic (1983) defines the horizontal axis of the matrix, supply risk, in terms of the assessment of availability, number of suppliers, competitive demand, make or buy opportunities, and storage risk and substitution possibilities. The focus of this research is cost based portfolio analysis for the vertical axis and assessment of supplier availability for the horizontal axis.

2.2Empirical Literature

From the above conceptual summary of Kraljic (1983) portfolio model, it is trivial that he focused only on strategic items merely pointing out a number of 'main tasks' for the other item categories. This gap has been filled by other scholars.

2.2.1 Purchasing portfolio management

As portrayed with a two by two matrix in fig. 2.1 below, efficient processing such as product standardization, order volume, and inventory optimization are among the strategies recommended for non-critical items. Leverage items permit the purchasing company to take advantage of its full buying power. Bottle neck items in the contrary causing a lot of problems and risks, volume insurance including: supplier control, inventory security, and back up plans are the strategies recommended. More analysis of the strategic items is suggested. Based upon the

comparison betweenthe buying strengths and the strengths of the supply market, three fundamental power positions are identified and connected with three different supplier strategies: balance, exploit, and diversify (Gelderman and Van Weele, 2002).

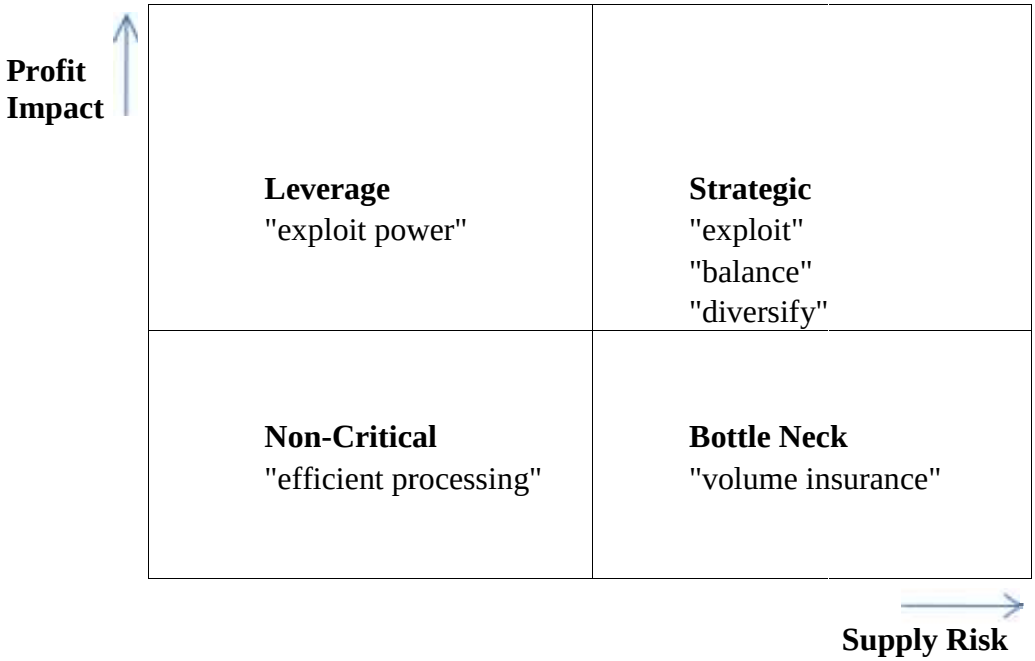

Fig. 2.1 Categories and strategies in the Kraljic approach (Gelderman and Van Weele, 2002)

2.2.2 Strategic directions for managing category spends

Based on their three in-depth case studies on the experience of purchasing professionals in the use of Kraljic portfolio matrix, Gelderman and Van Weele (2003) identified two types of strategic responses which are strategies to hold the current position in the quadrant and strategies to move to another position rather than Kraljic's strategic recommendations. And they described these responses for each item category as depicted in fig. 2.2 below. The study identified that at the right side of the matrix, the bottle neck and the strategic quadrants, strategy movements to the left are pursued to reduce high level of supply risk.

They proclaim that non-critical items are preferred to be moved upward while exceptionally exchanging leverage position for strategic position. Based on their findings, the authors recommend that the filling of a matrix ought to be taken as the beginningstep of portfolio analysis as users' reflection on the result is needed which may necessitate manual adjustments

after in-depth discussion on the positions. They reported that the users found Kraljic's framework facilitates this important strategic discussion.

Finally, the authors conclude that the portfolio model is useful in positioning items in the distinct segments and in developing various purchasing strategies.So, the primary purpose of this research aims at filling of the matrix to be used as the starting point of portfolio analysis by senior managers of the agency to facilitate their discussion up on the choice of purchasing strategy in the context of public procurement laws of the country.

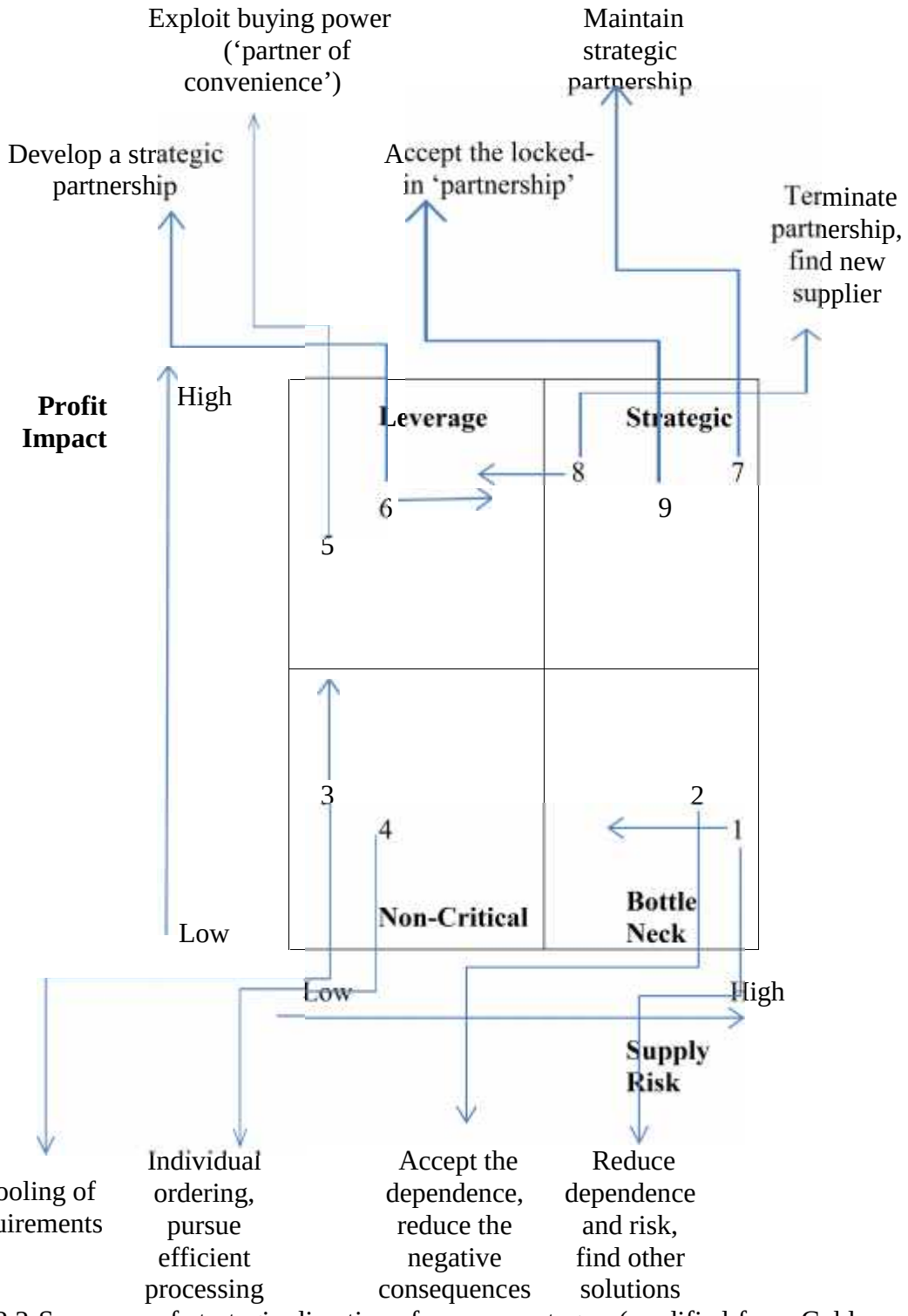

Fig. 2.2 Summery of strategic directions for every category(modified from Gelderman and Van Weele 2003)

2.2.3 Conditions for strategic directions

Even though Gelderman and Van Weele (2003) revealed the occurrence of several strategies per quadrant, their findings do not provide an insight on the conditions that determine the choice for a specified purchasing strategy.

A study made by Caniels andGelderman (2005) filled this gap which proved that relative power and total interdependence issues in buyer-supplier relationships are some of the conditions that help in determining which strategy to be used.According to their findings, the strategies in the strategic and bottle neck quadrant which are aimed at moving(strategies 8 and 1 in fig. 2.2) arepursued when buyer's dependence is relatively low regardless of the level of supplier's dependence which is less critical for this decision. Even though buyers usually prefer maintaining their position in the leverage quadrant, the findings recommends engaging in a partnership which is moving to the other quadrant (strategy 6) due to the presence of relatively high level of both buyers and suppliers interdependence.

Their study shows that the levels of buyer's and supplier's dependence do not seem to affect the choice of either changing or maintaining the position in the non-critical quadrant (strategies 3 and 4).From this, the authors conclude that the levels of buyer's and supplier's dependence largely determine the position of a purchasing strategy in the matrix. Finally, they conclude that positions in the bottle neck and strategic quadrant are associated with buyer supplier relationship characterized by supplier dominance while positions in the leverage and non-critical quadrant are perceived to have a balanced power nature.

2.2.4 Global sourcing and procurement strategy

As identified by Loppacher et al. (2006), there are four procurement strategies based on the interaction between supply source and purchasing location strategies with respect to the behavior and impact of relevant variables on strategic dimensions: Centralized purchase through global supply, Local purchase with local supply, Centralized purchase with localsupply, and Local purchase with global supply. Centralized purchase through global supply applies for commodities registering ahighly concentrated world offerwith significant economicadvantages

provided by economiesof scale drawn from purchase volumes; and for materials required by affiliates andrelevant to final product qualityregistering local shortages at expected quality levels. Local purchase with local supply applies for standard, locallyavailable materials (domesticproduction or locally basedrepresentatives for non-global multinational companies) with required quality andcompetitive pricing and registeringrelevant freight cost incidence; for customized or highly adjustedmaterials involving close buyer-supplierinteraction; and for labor-intensive materials andgeneral services, which requirelocal supply and follow-up.

Loppacherand his colleagues also remark thatcentralized purchase with localsupply strategy is the least common strategy which involves standardmaterials relevant to final product quality and purchase value and which registered local orregional availability at required quality and price levels. Theirsignificant freight componentdrives companies to prefer localsupply, with corporate interventionfor supplier selection and pricenegotiations to ensure qualitystandard compliance and to exploitvolume leverage.Local purchase with global supply strategy includes ratherirrelevant materials (mostlycommodities) required by allsubsidiaries, with highlyconcentrated global suppliershaving local affiliates orrepresentatives, thus allowing forlocal supply through a directrelationship with domesticrepresentatives, handled by localbuyers with centrally negotiatedbenchmark prices; and it also includes components involving high qualityand complexity requirements,though irrelevant as to purchasevolumes, which have requiredglobal suppliers but do not justifycentralized intervention, thusallowing for greater flexibility andswiftness through local directimports.

2.2.5 Knowledge gaps and Conclusion

When it comes to pharmaceutical procurement process knowledge gap at the agency, a very few researchers attempted to address some thematic areas of the agency such as assessment of factors influencing good pharmaceuticals procurement practice at EPSA by Berhie (2017); and assessment of pharmaceuticals distribution system: the case of EPSA by Teketel (2017) neither of which addressed the challenges faced by the agency due to the absence of procurement strategy based on pharmaceuticals category as per Kraljic portfolio matrix.

An important research gap identified by Haymero (2015) reveals that PPA &MoFED“Should introduce a comprehensive and sector-specific procurement manual for pharmaceuticals, with a concise set of clear rules and guidelines”. It also suggests the preparation of separate threshold matrix for different procuring entities based on the type and cost of products they procure, core missions, values, and the annual procurement expenditure of procuring entities. The need to regular revision of the financial thresholds for different procurement methods based on national and international market conditions of pharmaceuticals and international best practices is one of the recommendations made by this study. It also advises EPSA, FMoH, and EPSA’s board of directorsto publish and disclose the latest market values of pharmaceuticals on a regular basis and inform policy makers in public procurement.

Therefore, it is reasonable to conclude that the result of this research paper will play a critical role in facilitating this strategic decision making process by these senior managers.

2.3Conceptual Framework

Now days, procurement is a critical part of the whole business process of organizations for their sustainable competitive advantage.And the emphasis has been shifted from merely short term cost minimization to long term value creation and delivery. Thus, organizations are supposed to focus on the type of procurement strategy they need to pursue to achieve the sustainable competitive advantage they always seek. The other point that they need to consider here is the type of supplier relationship based on the category of goods or services procured.

Scholars have proved that Kraljic’s (1983) portfolio model analysis is the starting point that organizations need to consider to make decisions on which procurement strategy to use and what type of supplier’s relationship to have for every goods or service to be procured.Organizations are expected to categorize all of procured items based up on profit impact and supply risk. While profit impact is a function of the following variables: the volume purchased, percentage of total purchase cost, impact on product quality (value of item); supply risk is impacted by the variables: supplier availability, number of suppliers, and storage risk and substitution possibilities.After analyzing these variables, an organization should classify all of procured items into four categories: strategic (high profit impact, high supply risk), bottle neck (low profit

impact, high supply risk), leverage (high profit impact, low supply risk), non-critical (low profit impact, low supply risk).

Based on its strength and the supply market's strength, the organization needs to develop procurement strategies and the type of supplier relationship that it should have with suppliers after the determination of suppliers positioning matrix. Then, the organization is recommended to use the following strategies for strategic items: exploit (in case of buyer dominance), balance (in case of balanced relationship), and diversify (in case of supplier dominance); for bottle neck items: volume insurance, supplier control, inventory security, and back up plans are recommended; for leverage items, organizations are recommended to take advantage of its full buying power (exploit); for non-critical items, efficient processing such as product standardization, order volume, and inventory optimization are recommended.

Therefore, As summarized in the diagram below, it is possible to conclude that the procurement strategy that the buyer needs to use determines the type of supplier's relationship that the two parties, buyer and supplier, should have which in turn is determined by the category of goods or services to be procured.

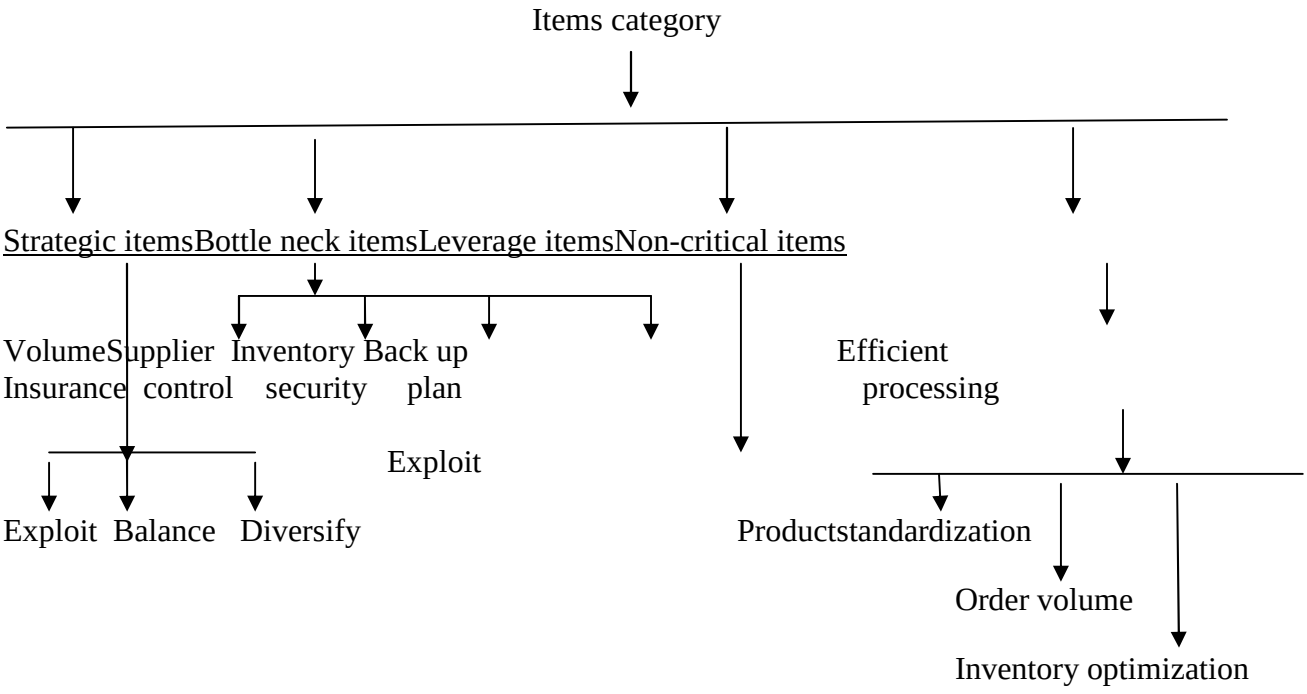

Figure 2.3 Item category versus procurement strategy

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter presents the methodology used to assess pharmaceutical categories with respect to procurement strategy as per Kraljic portfolio model of three years (2015, 2016, and 2017) pharmaceuticals procurement processes in Ethiopian Pharmaceuticals Supply Agency.This chapter is organized in five sections: the first section presents research approach and design;the second one is about population and sampling; the third section outlines data collection; the fourth section deals with data analysis; and the final section is about ethical consideration.

3.1 Research Approach

There are two basic research approaches which are quantitativeand the qualitative approach. Quantitative approach involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion. Quantitative research is based on the measurement of quantity or amount which is applicable to phenomena that can be expressed in terms of quantity. Qualitative approach to research is concerned with subjective assessment of attitudes, opinionsand behavior. Research in such a situation is a function of researcher's insights and impressions (Kothari, 2004).A variable can be either discrete or continuous. Adiscrete variable can have observed values only at isolated points alonga scale of values. In business statistics, such data typically occur through the process of counting; hence, the values generally are expressed as integers.A continuous variable can assume a value at any fractional pointalong a specified interval of values. Continuous data are generated by the process ofmeasuring (Leonard, 2003).In the case of this study, the main variables involved are procurement cost which is continuous, supplier availability (number of available suppliers) which is discrete, and supplier availability rate is continuous variable as it involves a fraction of total supplied quantityall of which being able to expressed in terms of quantity.Therefore, quantitative approach had been used in this study.

3.2 Research Design

There are three basic types of research designs viz. exploratory, descriptive, and explanatory. Exploratory research design is a type of research design which is recommendedfor those projects

that are addressing a subject about which there are high levels of uncertainty and ignorance, and when the problem is not very well understood (i.e. very little existing research on the subject matter). It involves types of questions such as ‘What is the case?’ and‘What are the key factors?’.Descriptive research design hasthe aim of providing an accurate and valid representation of the factors or variables that are relevant to the research question. It attempts to answer questions such as ‘How many?’,‘What is the incidence of x?’, and ‘Are x and y related?’. Explanatory research design is a type of research design which aims to identify any causal links between the factors or variables that pertain to the research problem. It attempts to answer such types of questions as‘Why?’ and‘What are the causes of y?’(Wyk).Therefore, because of the nature of research questions that this study attempts to address,descriptive research design had been used.

3.3 Population and Sampling

According to the pharmaceuticals procurement list of EPSA (2018), all of the pharmaceuticals procured by the agency had been classified into two broad categories based on the fund that owns the pharmaceuticals viz. revolving drug fund (RDF) pharmaceuticals being owned by the revolving fund of the agency and health program pharmaceuticals which are owned by global fund (GF). The RDF pharmaceuticals are further sub-categorized based on their nature and use into regular medicines, laboratory pharmaceuticals, medical supplies, routine medical equipment, and capital medical equipment. The focus of this research is the three years (2015-2016, 2016-2017, 2017-2018) procurement records of the entire list of regular medicines.The study sample,only that which exists as scanned soft copy,had been drawnfrom allprocurement records which were started being registered in 2007.

3.4 Data Collection

The type of data that was used in this research is pure secondary data. The source of the data was procurement records which the agency is required to document by public procurement laws of the country. The type of procedures used to collect the data is non-participant observation of the specified procurement documents by using an observation recording form as the data collection instrument.

Descriptive research method is used to provide important information about the phenomena under study. The main techniques to data collection in research methods are formal testing (psychological,educational, academic, intelligence), interviewing, global ratings, observation, and biological measures. The operationally defined researchquestions and the nature of the variables under investigation usually drivethe choice of techniques for data collection(Marczk, DeMatteo, and Festinger, 2005). Based on the operational definition of the research questions and the nature of the variables involved in this study, the data collection technique thatwas used is observation of procurement documents by using an observation recording form as the data collection instrument.Therefore, descriptive research methodhad been used to conduct this study for the variables cannot be controlled by the researcher but described with the phenomena that exist at the time of the research.

3.5 Data Analysis

Descriptive statistics approachwas used in this study to manage data. The key variables involved in this study are cost of pharmaceuticals, tender processing period (time), supplier availability rate which areall continuous variables, andsupplier availability (available number of suppliers) which is a discrete variable. Hence the study used Pareto analysis to categorize items on the profit impact axis of Kraljic portfolio matrix based on their procurement price and it utilizedexcel sheets to categorize items along the supply risk axis of the matrix based on their supplier availability rate.

When it comes to the data analysis procedure of the key variables, the mean of pharmaceutical cost and tender processing time of each pharmaceutical wasdetermined first using descriptive statistics and then the mean cost of each pharmaceutical was further analyzed using Pareto analysis technique to categorize items on the profit impact axis of Kraljic portfolio matrix. The mean tender processing time of each pharmaceutical as per procurement method employed was used to compare each procurement method based on the time it took to process the tender.Once more, descriptive statistics approach had been used to determine supplier availability rate of an item which is obtained by multiplying the total number of available qualified suppliers of that

item with the percentage (fraction) of the quantity supplied out of the total quantity requested. Then, the median of all of the items' supplier availability rate value which is 1 was taken as a cutoff point for high and low supply risk itemson the supply risk axis of Kraljic portfolio model.

3.6 Ethical Considerations

As previously mentioned, the study relied on collection and analysis of procurement records in the agency as secondary data. And public procurement records are strictly confidential documents.Because of this, public bodies are very vigilant to let documents be accessible for anyone who asks for them.Hence, ethical issue here was a very big concern for the researcher. Therefore, an official communication was made to tender management and contract management directoratesto assure that any information in the documents will be kept confidential.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The preceding chapter presented the relevant methodologies followed to undergo the study. This chapter explains and discusses the results and findings based on the analysis performed on the collected data.The spend and the item supply risk data of the study were taken from the agency's pharmaceutical procurement records from 2015 to 2017.

To determine the position of items with respect to the business impact axis of Kraljic portfolio model, Pareto principle is used on the mean annual FOB price of each item; to determine the position of items with respect to supply risk axis of Kraljic portfolio model, the supplier availability rate of each item was used which is obtained by multiplying the total number of available qualified suppliers of that item with the percentage (fraction) of the quantity supplied out of the total quantity requested. Then, as indicated in the table below, the median of all of the items' supplier availability rate value which is 1 was taken as a cutoff point for high and low supply risk items. That means, those items whose supplier availability rate value is greater than or equal to 1 are categorized in low supply risk item category while those with supplier availability rate value less than 1 are counted with high supply risk item category. Finally, the discussion attempts to address the objectives of the study, and answer the research questions.

Central tendency	Supplier availability rate value	Remark
Mean	1.543	
Median	1.000	
Mode	1.000	

Table 4.1 Supplier availability rate values' central tendency

4.2 Response rate and demographic data

Being not a survey research, the study used an observation recording form equivalent to survey research data collection instrument to collect pure secondary data from the three years procurement record of the agency.

The three years (2015, 2016,2017) procurement records of the entire list of regular edicineswere taken as study population. Totally,41 tenders: 4restricted tenders, 4 international shopping,7 direct tenders, and 26 open tenders of procurement recordwhich exist as scanned soft copy were drawn as study sample based on convenience, accessibility, and availability.

4.3 Results

4.3.1 Spend analysis overview

It is crucial to summarize the general overview of the spend analysis to provide a brief look to the overall result of the study. The agency'sannual international competitive bidding (ICB)procurement volume of regular medicines varies from ETB509,735,219.84 to 1,623,349,524.58 within the years 2015 to 2017.

Total number of items					**Total number of qualified suppliers**	
Invited items			**Not invited (un sourced items)**	**Total**	**Succeeded**	**Failed**
Procured items	**No supplier items**	**Cancelled or Retendered items**				
453	158	44	112	767	85	18

Table 4.2 Total number of items and active suppliers

As portrayed in table 4.2 above, there were totally over 767 items of this category from which 654 were invited to suppliers with open tenders within these three years. From these invitations, only 453 items were procured for 158 items lacked suppliers while 43 items were cancelled or retendered from the tenders for either of the following reasons: profound offered price variation from allocated budget or last winner price, stock availability, and/or arrival of previously ordered

products. The other 113 items from the total remained unsourced.Totally, 103 qualified suppliers participated in these tenders among which only 85succeeded in winning the awards.

The largest spend item is ‘Ringer's Solution - Each contains Na+ 147mEq + K+ 4mEq Cl- 155mEq - Intravenous Infusion with Giving Set’, with ETB 230,656,000.00 procurement per year, followed by ‘Tetanus Antitoxin (TAT), Equine - 1,500 IU/ml in 1ml Ampoule – Injection’ and ‘Ceftriaxone - 1g in vial - Powder for Injection with 10ml Diluent’, with ETB 55,571,239.37 and ETB 52,580,851.28 procurement per year respectively.

Only 55 items which are8.41% of the total items count for 80% of the items expenditure.The top 5 suppliers or venders with the highest order value are as follows:AculifeHealth Care from India with ETB743,965,328.03, Kilitch drugs Ltd. from India with ETB 179,996,335.65, CSPC Zhongnuo Pharmaceuticals (Shijiazhuang) Co. Ltd. from China with ETB 173,237,804.44, Gulf Pharmaceuticals from UAE and Ethiopia with ETB 136,214,338.22, and Sanofi Aventis from France and Germany with ETB 104,472,601.76.

4.3.2 Supply risk analysis overview

When it comes to the supply risk analysis findings of the study, 443 items were found to be in the low supply risk item category with supplier availability rate value ranging from 1 up to 11. The rest that are 211 items were found to be in the high supply risk item category with supplier availability rate value ranging from 0.000 up to 0.998.

4.3.3 Item category (positioning) overview

Generally, the result shows that 5 items found to be in strategic item quadrant which is 0.76% of the total invited items and count for 5.33% of the total annual expenditure of all items.50 items or 7.65% the items are in leverage item quadrant and count for 74.82% of the total annual expenditure of the items. The bottle neck quadrant has 206 items which are 31.50% of the total invited items and count for 1.74% of the overall annual expenditure of the items. The rest of the items and their respective expenditure belong to the non-critical item quadrant.

4.3.4 Tender processing period analysis overview

Based on the analysis of the data on four types of most used procurement methods: international competitive bidding (ICB), restricted tenders (RT), direct tenders (DT), and international shopping (IS), the findings reveal that the evaluation period of ICB tenders is the longest followed by restricted tenders; while direct tenders are found to be the third in length of evaluation period, international shopping is found to take the shortest period of evaluation.

4.3.5 Spend Analysis

4.3.5.1 Spend by year

Tender Type	Procurement volume by year in ETB			Total
	2015	2016	2017	
ICB	509,735,219.84	1,623,349,524.58	747,371,618.69	2,880,456,363.11

Table 4.3 Three years procurement volume

As depicted in table 4.3,it is obvious that the value of the three yearsexpenditure is not evenly distributed, 2016's expenditure being substantially the highest of the other two years. This is not because of the presence of high spend items in 2016 procurement but it is because of the procurement of high number of items.

4.3.5.2 Spend by item

Top three high spend items	Mean spend in ETB per year	Portion of total no. of items with 80% of total spend
Ringer's Solution - Each contains Na+ 147mEq + K+ 4mEq Cl-155mEq - Intravenous Infusion with Giving Set	230,656,000.00	8.41%
Tetanus Antitoxin (TAT), Equine - 1,500 IU/ml in 1ml Ampoule – Injection	55,571,239.37	
Ceftriaxone - 1g in vial - Powder for Injection with 10ml Diluent	52,580,851.28	

Table 4.4Portion of total number of items with 80% of total spend

The finding shows that 55 items are the top 8.41% of the total items with 80.15% of the total spendor expenditure. However, among the items with the highest expenditure, the top three items are found to dominate the spend as indicated in table 4.4.

4.3.5.3 Spend by vendor (supplier)

No. of vendors	Min. % of supplied quantity	No. of items within high spend items
2-11	83%	57

Table 4.5 Top 20% of items with the highest number of vendors

As portrayed in table 4.5, the top 153 items or 20% of the total items with the highest number of vendors are found to have 2 up to 11 vendors supplying a minimum of 83% of the total requested quantity of each item.Among these items, 57 items are identified to be within the high spend (high business impact) items.

Total no. of vendors (suppliers)		No. of top 20% vendors (suppliers)	Range of mean annual order value in ETB
Succeeded	Failed		
85	18	17	16,362,359.71 up to 247,988,442.68

Table 4.6 Top 20% of vendors (suppliers) with the highest order value

As indicated in table 4.6,17 vendors (suppliers) are recognized to be the top 20% of the successful suppliers with the highest mean annual order value ranging from ETB 16,362,359.71 up to ETB 247,988,442.68.

No. of top 20% of total vendors (suppliers)	Range of mean annual number of items supplied
21	5 up to 19

Table 4.7Top 20% of total vendors supplying the highest no. of items per annum

As the table above shows, the top 20% of total vendors (suppliers) supplying the highest number of items, supplied number of items ranging from 5 up to 19 items within a year's supply period.

4.3.6Supply risk analysis

	Low supply risk items	High supply risk items	Total
Range of supplier availability rate value	1 up to 11	0.000 up to 0.998	
Portion of No. of items	67.74%	32.26%	654
Mean annual proc. amount	92.92%	7.08%	ETB 992,959,536.16

Table 4.8 Items supply risk value

Table 4.8 shows that 67.74% of the total items that consumed 92.92% of the total annual procurement amountfell in the low supply risk group of items with supplier availability rate value ranging from 1 up to 11; while 32.26% of the total items which used up 7.08% of the total procurement amount fell in high supply risk items group with supplier availability rate value ranging from 0.000 up to 0.998.

4.3.7 Item category (positioning) study

	Leverage	Strategic	Non-critical	Bottle neck	Total
Mean annual proc. amount in ETB	742,890,526.17	52,968,818.75	179,790,602.99	17,309,588.25	992,959,536.16
No. of items	50	5	393	206	654

Table 4.9Mean annual procurement amount and number of items per item quadrant

Table 4.8 shows that the highest expenditure which amounts ETB 742,890,526.17 is consumed by 50 items in leverage quadrant which is followed by the expenditure of 393 items in non-critical item quadrant that amounts to ETB 179,790,602.99. Items in strategic quadrant are only 5 in number while being the third in spend which amounts to ETB 52,968,818.75; and 206 items in

bottle neck quadrant are found to be the fourth category with an expenditure of ETB 17,309,588.25.

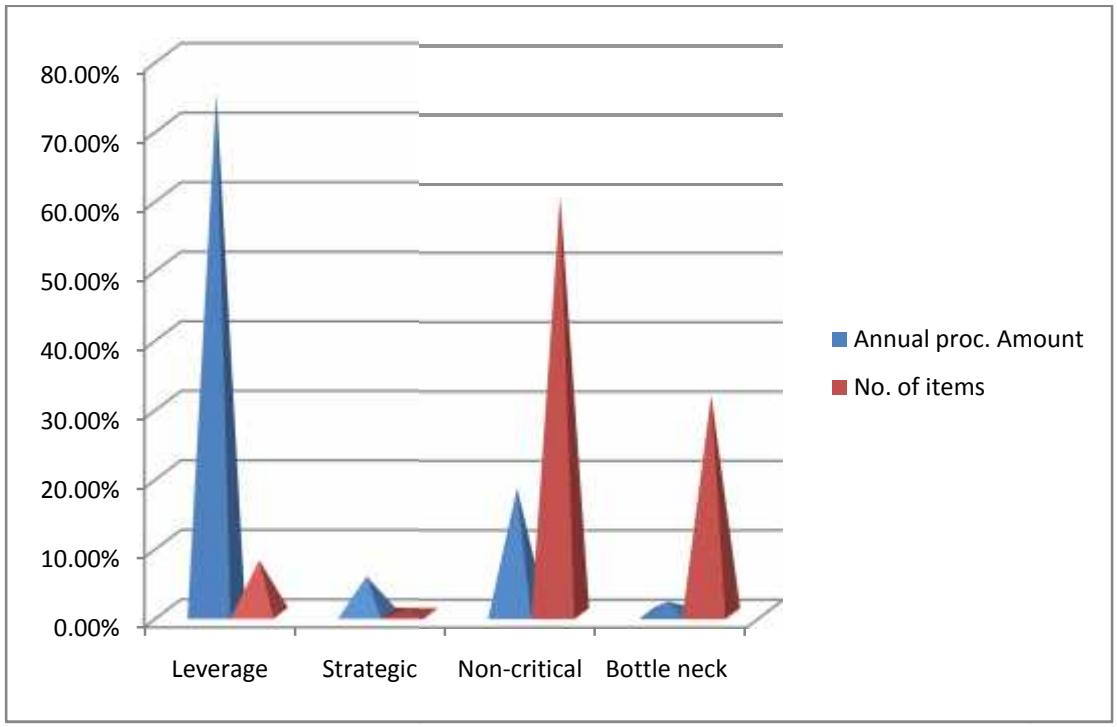

Figure 4.1Items position

As portrayed above in Figure 4.1, 74.82% of the mean annual procurement amount is consumed by items in leverage item quadrant that are about 7.65% of the total number of items; 5.33% of the annual procurement amount is consumed by items in strategic quadrant which are only about 0.76% of the total line items; items in non-critical item quadrant that constitute 60.09% of the total number of items consumed 18.11% of the total procurement amount while only 1.74% of the procurement amount is taken by items in bottle neck item quadrant that count about 31.50% of the total number of items.

4.3.8 Tender processing period analysis

Procurement method	Mean processing period (in days)
International competitive bidding	146
Restricted tender	122
Direct tender	72
International shopping	63

Table 4.10 Tender processing period per procurement method

Table 4.10 depicts that the mean number of days elapsed by the processing of ICB procurement method is 146 being the longest period of all methods which is followed by 122 days of RT procurement method; while DT and IS methods of procurement took only 72 and 63 days respectively.

4.4 Discussion

As it had already been mentioned in the previous chapters, the broad objective of this study focused on examining the category of pharmaceuticals based on Kraljic (1983) portfolio model. The broad objective was systematically broken down into specific research questions as discussed in chapter one. This section presents the discussion and interpretation of the observations made on analyzed data.

Expenditure (spend) of each pharmaceutical in the total spend: As clearly stated in the literature review part of the study, a Pareto principle is achieved when 20% of spend category (total number of items) give rise to 80% of the spend (Spring Tide, 2010). However, the item spend analysis result in table 4.4 shows that only 8.41% of the total items contributes to 80% of the total spend.This problem happened because, out of the 654 items which were invited to suppliers with ICB procurement method, 158 items lacked suppliers while 43 items retendered or cancelled for either of the following reasons: profound price variation from allocated budget or last winner price, stock availability, and/or arrival of previously ordered products.These items contributed for the decrease of the percentage of number of items in the 80% spend. The other point here is that the findings made by Haymero (2015) which states that low financial thresholds of the PPA regulation and lack of consideration to nature of pharmaceuticals are some of the factors that affect efficient public pharmaceutical procurement practices at the

agency.Moreover, it suggests the preparation of separate threshold matrix for different procuring entities based on the type and cost of products they procure, core missions, values, and the annual procurement expenditure of procuring entities. The low financial threshold of the PPA regulation had restricted the agency not to use the efficient method of procurement for items that lacked suppliers.

Supply risk (supplier availability rate) of pharmaceuticals: As stated by Thai (2009), in the case of public procurement, procurement strategy means the leading global principle that defines the high level goals and expectations of the contracting authority such as finding a good, known and reliable supplier. Baily et al. (2005) states thatinitiatives and policies such as market testing, contracting out, private financeinitiative, competing for quality, facilities management and partnering all affect how equipment, goods and services are procured within government and the public sector. They help to shape the approach to the market, the preparation of the specification and evaluation of the most economically advantageous tender followed by pertinent relationships in order to meet the requirement.As shown in table 4.8, about 32.26% of the total items are categorized in high supply risk items with supplier availability rate of 0.000 up to 0.998. This means that about 211 items have zero number of suppliers or have only one supplier that supplied a maximum of 99.8% of the quantity requested.This occurred because of the lack of the appropriate procurement strategy to be applied based on assessment of the supply market.

Category or position of each pharmaceutical: The procurement strategies recommended for non-critical items are as follows: efficient processing such as product standardization, order volume, and inventory optimization. Leverage items permit the purchasing company to take advantage of its full buying power (exploit). Bottle neck items in the contrary causing a lot of problems and risks, volume insurance including: supplier control, inventory security, and back up plans are the strategies recommended. More analysis of the strategic items is suggested. Based upon the comparison between the buying strengths and the strengths of the supply market, three fundamental power positions are identified and connected with three different supplier strategies: balance, exploit, and diversify (Gelderman and Van Weele, 2002).

Relative power and total interdependence issues in buyer-supplier relationships are some of the conditions that help in determining which strategy to be used.Based on this principle, the strategies in the strategic and bottle neck quadrant which are aimed at moving either direction are pursued when buyer's dependence is relatively low regardless of the level of supplier's dependence which is less critical for this decision. Even though buyers usually prefer maintaining their position in the leverage quadrant, it is recommended engaging in a partnership which is moving to the other quadrant due to the presence of relatively high level of both buyers and suppliers interdependence. Positions in the bottle neck and strategic quadrant are associated with buyer supplier relationship characterized by supplier dominance while positions in the leverage and non-critical quadrant are perceived to have a balanced power nature(Caniels andGelderman, 2005).

Despite the recommendation of the above empirical researches on the implementation of which procurement strategy on which item category based on factors such as relative power and total interdependence, the findings of the study show that all of the items were procured using international competitive bidding method of procurement regardless of their item category on the portfolio quadrant.

Tender processing period: The goal of involving any form of decision support for bid evaluation is to help the effective and efficient creation and selection of the tender document and procurement method respectively and the execution of the evaluation itself such that they serve the goals of the tender, the process leads to high quality bids, and the result can be defended (Thai, 2009). However, as shown in table 4.10, the observations of this study reveal that there is inefficient usage of time on tender processing which is the time elapsed between procurement request date to deputy director general of the agency and award notification date to bidders.The absence of decision support such as an updated supply positioning model may be taken as one of the factors to this problem to result in the inappropriate procurement method selection.

CHAPTER FIVE

SUMMERY, CONCLUSIONS AND RECOMMENDATIONS

The aim of this chapter emphasizes pinpointing the major findings of the study and suggesting recommendations that can advocate any efforts made by concerned managers or procurement practitioners in the improvement activities ofpharmaceuticals procurement efficiency at the agency. Thus, it presents conclusions, major findings, and recommendations as follows.

5.1 Summery of the findings

According to Kraljic (1983) portfolio model, item spend is one of the variables he suggested to be analyzed for the vertical dimension of the model. This study had followed this suggestion to determine the coordinate position of items on the vertical axis of the portfolio matrix. Based on the rigor analysis made on the spend of each item, the findings had revealed that 8.41% of the total items contributed to 80.15% of the total spend.

Supplier availability is one of the variables suggested by this pioneer of procurement portfolio model to be analyzed for the determination of items' coordinate position on the horizontal (supply risk) axis of the portfolio matrix. The findings of the study had shown that 32.26% of the total items to be on the high supply risk category of items.

The amount of money spent with suppliers is one of the variables that determine the type of supplier relationship a buyer seeks to have. Having made analysis on spend by vendor (supplier), the findings of the study hadrecognized the top five vendors (suppliers) with highest order value viz.: Aculife Health Care from India, Kilitch Drugs Ltd. from India, CSPC Zhongnuo Pharmaceuticals (Shijiazhuang) Co. Ltd. from China, Gulf Pharmaceuticals from UAE and Ethiopia, and Sanofi Aventis from France and Germany.

The item positioning result of the study shows that 8.41% of the total items are found to be in the strategic and leverage item quadrant with 80.15% of the total expenditure. And 91.51% of the total items fell in non-critical and bottle neck item quadrants with 19.85% of the total expenditure.

The findings of the study on tender processing period indicates the mean number of days elapsed by the four most used procurement methods as follows: international competitive bidding is 146, restricted tender is 122, direct tender is 72, and that of international shopping is 63.

5.2 Conclusions

Now days, procurement portfolio models have received a considerable attention from academic world, business environments, and government organizations. Clearly, it is not recommended to manage all products and all buyer supplier relationships in the same manner.Generally speaking, procurement portfolio models are aimed at developing different procurement and supplier relationship management strategies based of products and suppliers category.Kraljic (1983) is the pioneer to introduce the initial comprehensive portfolio approach that sorts out products based on two dimensions, profit impact and supply risk of products; and resulted in a two by two matrix in which he categorized products as: bottle neck, non-critical, leverage and strategic itemseach demanding a distinctive approach towards suppliers and procurement strategy (method).

Even though the nature of public procurement is different from private company procurement in which public procurement is governed by strict procurement rules and guidelines,recently, portfolio approach has been found very helpful in developing these rules and guidelines. However, a general and extremely low financial threshold which was developed by the public procurement regulations and guidelines of Ethiopiaregardless of the nature of products is one of the main factors that posed the poor pharmaceuticals procurement efficiency at EPSA.It is believed that the findings of this study which are summarized hereunderassist concerned stakeholders in preparation of separate threshold matrix based on the type and cost of pharmaceuticals. This study revealed a number of interesting findings listed as follows.

- One of the factors that impact the choice of supplier relationship is the spent amount of money on items. The study had segregated the total items on the business impact dimension (vertical axis) of Kraljic (1983) portfolio model based on item spend. And 8.41% of the items were found to be on the high spend item category.In addition to this, the study had also recognized the top three items on which the largest sums of money are spent viz.: Ringer’s solution, Tetanus antitoxin (TAT), and Ceftriaxone – 1gm vial with the first profoundly dominating the rest.

- It is not only the sums of money spent on items that determine the type of supplier relationship to be pursued by a buyer but also the type of products or services being procured should be taken into consideration to improve security of supply. Moreover, the degree of competitiveness of the supply market place is another factor with which the type of supplier relationship is contingent upon. The study had revealed that 32.26% of the total items to be on the high supply risk category of items.
- Like any business company, government organizations now days are seeking to develop mutual or partnership relationship with those suppliers with whom large sums of money are spent.The study had identified the top five suppliers with the highest order value namely: Aculife Health Care from India, Kilitch Drugs Ltd. from India, CSPC Zhongnuo Pharmaceuticals (Shijiazhuang) Co. Ltd. from China, Gulf Pharmaceuticals from UAE and Ethiopia, and Sanofi Aventis from France and Germany.

- The typical item positioning features are expected to be such as 80-90% of the expenditure fall on strategic and leverage item quadrants with 10-20% of the total items while bottle neck and non-critical item quadrants take 10-20% of the total expenditure and 80-90% of the total items. However, the result indicates a profound problem of deviation from this expectation that which shows only 8.41% of the total items are found to be in the strategic and leverage item quadrant with 80.15% of the total expenditure. And 91.51% of the total items fell in non-critical and bottle neck item quadrants with 19.85% of the total expenditure.
- Procurement lead time is a vital factor for efficient performance of an organization involved in supplies procurement management. Because, a reduction of procurement lead time has a direct impact on performances such as: reduction of procurement cost, profit maximization, effective operation in customer satisfaction. Therefore, procurement lead time should be given a serious attention. A recent study made on one of the procurement lead time of medical commodities at EPSA reveals that procurement lead time is directly related to the types of activities involved in the process, the type of procurement method, and the category of the item to be procured.The findings of this study on tender processing period show unnecessary wastage of timeon tender processing activities.

5.3 Recommendations

Based on the findings and conclusions drawn, the following recommendations have been forwarded so as to improve the overall regular medicines procurement unit performance:

- The first step in public procurement strategy is to fully understand the purchase requirement which is the responsibility of procurement practitioners (officers) in the case of EPSA; in other words, the concerned procurement officer is supposed to prepare a procurement plan with the details of the items such as: item specification, unit, quantity, allocated budget, and procurement method based on the financial threshold permitted by public procurement regulators.Past expenditures for each commodity as well as the total expenditures for the commodity as a percentage of the total are the primary data required by procurement practitioner for preparing the above procurement plan. Therefore, procurement practitioners at EPSA are recommended to use the findings on spend analysis of this study as an input for their procurement planning activity.
- Once again, in the preparation of procurement plan, the procurement practitioner is in need of data on the degree of competitiveness of the supply market place for a particular medicine, specially, when it comes to the selection of a procurement method for which, usually,practitioners are restricted only to the financial threshold allocated by regulators even if supply market place competitiveness (supplier availability) alsomust considered. The practitioner is recommended to use the supply risk analysis result of this study asaninput together with or as an alternative to other important variables such as the permitted financial threshold.
- It is advisable for higher officials of the agency and policy makers to pay a strict attention on suppliers with the highest order value and items with high spend amount. The top five suppliers with the highest order value have been identified by the study in which one supplier, Aculife Health Care, dominated the others. Furthermore, this supplier had been found to solely supply the item, Ringer's solution, which is an item found to be with the highest spend amount. Even if this item was found to be in leverage quadrant with number of suppliers 2, the whole quantity requested throughout these three years was supplied by this supplier. Despite being in the leverage quadrant as for now, the item may be found to move to the strategic or bottle neck quadrant in the future because ofthe resignation of the other supplier as a result of lack of market share at EPSA.There is a

room in the procurement guideline of EPSA which permits the agency to reduce or add 20% of total requested quantity from or to the winner supplier. Therefore, higher officials of the agency and policy makers are recommended to either use this room as an opportunity to give the losing supplier 20% of the awarded order amountor establish another wayto keep such suppliers in the business. This absolutely reduces the degree of dependency on Aculife Health Care as single source for that item.

- The filling of a portfolio matrix is not the finishing point of portfolio analysis but it is a starting point. Because users are supposed to reflect on the results. In fact, it may be necessary to make manual adjustments. Thus, senior managers of the agency and associated stakeholders are recommended to make in-depth discussion on the item positioning results of this studyas an important phase of the analysis. Besides this strategic discussion, the following recommendations are forwarded based on the findings:
    - ✓ EPSA, together with FMoH are recommended to remove or substitute some or all of the items which are the least to be procured and/or items in the high supply risk category to achieve the typical item positioning features.
    - ✓ Then, EPSA and FMoH are recommended to make an assessment on the value of pharmaceuticals relative to each other (or segregate the items into vital, essential, and non-essential items based on their value to the agency and/or final users) to give the business impact axis of the findings a holistic nature.
    - ✓ And then, EPSA is recommended to make another assessment on the storage risk and substitution possibilities of items to fill the gap in the necessary variables for analysis of supply risk dimension of the matrix.
    - ✓ Having made, suppliers positioning matrix analysis, the agency is recommended to prepare a consolidated supply positioning.
    - ✓ Most importantly, policy makers are recommended to make an adjustment on the financial threshold of each item based on the overall results of this paper and the recommended assessments.
    - ✓ Finally, the agency is recommended to exploit its power on leverage items, make balance of power and diversify its suppliers for strategic items, make efficient processing on non-critical items, and volume insurance (such as inventory holding) is recommended for bottle neck items.

- As claimed by a recently made study on pharmaceuticals procurement lead time analysis by procurement practitioners at EPSA, pharmaceuticals procurement lead time has been found to be related to the following variables: the type of activities involved in the whole procurement process, the type of procurement method, and the category of pharmaceutical to be procured.One of the groups of activities involved in the procurement process is the group of tender processing activities. Based on the findings of this study on tender processing period, EPSA is recommended to make job audits and activity lead time assessment on tender processing activities for each type of procurement method and pharmaceuticals category.

5.4 Suggestions for further study

In spite of the rigorous analysis made, the study contains some limitations that may entice further researches. Based on these limitations, the following suggestions have been forwarded for further study:

(i) Assess the value of pharmaceuticals and combine this value of each pharmaceutical with the spend analysis result of this studyto get holistic variables in the analysis of the position of each item on the vertical dimension of Kraljic portfolio model.

(ii) Investigate the storage risk and substitution possibilities of the itemsand combine this result with the supplier availability rate result of each item in this study to have full variables for the horizontal axis position of each item in Kraljic portfolio model.

(iii) Analyze the suppliers positioning matrix of the total items based on spend by vendor analysis result of this study and an assessment of vendor (supplier) account attractiveness (supplier performance assessment).

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Appendix A: Research Instrument on Tender Result

Item No.	Item	Unit	Tender No.	Quantity	Tender Type	Tender Result		
						Awarded Supplier (Winner)	Retendered (Reason)	Cancelled (Reason)
1								
2								
3								

Appendix B: Research Instrument on business impact, supply risk, and tender processing period

Item No.	Item	Unit	Quantity	Impact on Business (Profit Impact)		Supply Risk	Tender Processing Period	
				Unit Price in USD	Inco-term	Number of Bidders Submitting Offer per Item	Tender Initiation Date (Budget Proposal to DDGO)	Award Notification Date
1								
2								
3								